A treatise on the diseases and physical education of children / by John Eberle.

Contributors

Eberle, John, 1787-1838.
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Publication/Creation

Philadelphia : Grigg & Elliot, 1837.

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A TREATISE ON THE DISEASES

AND

PHYSICAL EDUCATION

OF

CHILDREN,

BY JOHN EBERLE, M. D.

PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN THE MEDICAL COLLEGE OF OHIO; MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE ACADEMY OF SCIENCES OF PHILADELPHIA; CORRESPONDING MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF BERLIN, IN PRUSSIA, &c. &c.

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Printed by
T. K. & P. G. COLLINS,
No. 1 Lodge Alley, Philadelphia.

TO

N. R. SMITH, M. D.,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF MARYLAND, &c. &c.

THIS WORK IS RESPECTFULLY

INSCRIBED,

AS AN HUMBLE ACKNOWLEDGMENT OF THE HIGH REGARD ENTERTAINED

FOR HIS PROFESSIONAL TALENTS, AND PRIVATE WORTH,

BY HIS FRIEND AND FORMER COLLEAGUE,

THE AUTHOR.

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BOOK I.

OF THE PROPHYLACTIC AND PHYSICAL MANAGEMENT OF CHILDREN.

CHAPTER I.

OF THE CONDUCT OF MOTHERS DURING PREGNANCY.

THAT the fœtus may be variously and injuriously affected, by causes acting through the medium of the maternal system; and that disease and constitutional infirmity are thus often produced during the uterine stage of life does not appear to admit of a doubt. From the moment, therefore, that conception has taken place, a new and most sacred duty devolves upon the female. She is bound by all the ties of maternal sentiment, of humanity and of moral and religious obligations to protect the nascent being in her womb, against every circumstance under her control, which may have an unfavourable influence on its delicate and uninured organization.

Though not in itself a state of disease, pregnancy is evidently attended, in the majority of instances, with a decidedly increased aptitude to morbific influences. Augmented sensibility and irritability of the nervous and sanguiferous systems, appears to be a natural concomitant of all great efforts of physical development in the animal organization. We observe it in dentition, and at the age of puberty, and it is, in general, equally strongly marked during the progress of those important developments which take place in the female system, from the commencement to the completion of gestation. When to this we add the remarkable tendency to general plethora, and the rise of the various powerful and pervading sympathies which occur during pregnancy, we have a combination of circumstances peculiarly calculated to increase the liability to disease and injury, from the influence of exciting and irritating causes.

Without doubt, many instances of pregnancy occur in which good health is enjoyed throughout its whole course, although little or no particular care is taken to avoid the usual sources of injury in such cases. Very frequently, however, the reverse obtains; and we daily witness much suffering and danger, both to the mother and child, from the influence of causes which, with proper care, might be avoided or rendered inoffensive.

The most serious, and perhaps, most common injurious consequence resulting from errors in this respect is *abortion*. Females are not, in general, sufficiently impressed with the great importance of attending to the precautionary measures, which reason and experience dictate, in relation to the prevention of this accident. They are apt to look upon abortion, as a temporary evil—an affair of a few hours, or at most of a few days suffering, and generally of no other serious consideration than that which may be due to the premature destruction of the embryo. This consideration might, indeed, be deemed a sufficient motive for the exercise of adequate care in this respect; but it may well be doubted, whether it often receives the regard which a proper sense of duty would dictate. In addition, however, to this appeal to the moral sentiment of the mother, there are other circumstances in relation to her own welfare, which when properly presented to her mind, seldom fail to excite a suitable attention to this important subject. Besides the very distressing circumstance that abortion, is in general peculiarly liable to recur, after having once taken place, we may mention the following as among the ordinary evil consequences of this accident—namely leucorrhœa, menorrhagia, dysmenorrhœa, prolapsus uteri; schirrus uteri, various nervous affections, especially chronic hysteria, dyspepsia, and general debility and ill-health. It is indeed a very rare occurrence to meet with a healthy female who has aborted more than once. Permanent injury to health is much more apt to result from abortion than from regular parturition. The benevolent author of nature has endowed every being with powers adequate under ordinary circumstances, to sustain the natural operations which it is destined to perform, without any particular evil consequences. The premature separation and expulsion of the fœtus, however, is an occurrence contrary to the design and regular course of nature and can not take place without more or less violence to the system and consequent disorder and infirmity.

But it is not simply with the view of obviating this accident, that the pregnant female is so deeply concerned in guarding against the operation of injurious causes. The future health and vigour of the child may be materially affected by the conduct of the mother in this respect. Organic debility and morbid predispositions may be thus produced, which, in their ultimate

consequences, may prove more afflicting than abortion itself. It has indeed been supposed, that as there exists no direct or continuous communication between the fœtus and the mother, either by the blood vessels or the nerves, the former, probably, never participates to any serious extent, in the general diseases of the latter. It is observed that infants, well nourished, and apparently in good health, are occasionally born of mothers who had laboured under severe and irremediable disease during the whole period of gestasion. This is doubtless the case in many instances; but it should be observed that although the new-born infant may appear to enjoy a good state of health, it frequently happens that the disease or predisposition contracted during gestation, remains latent or dormant for months or even years after birth, before it is developed; and thus, there may be the appearance of a sound and healthful state of the constitution, during infancy, although the seeds of disease may be deeply deposited in the system. The want of a continuous vascular or nervous communication between the fœtus and the mother, can not be regarded as a sufficient ground for denying the possibility of the passage of disease from the maternal to the fœtal system. The fact that syphilis and small-pox, not to mention various other affections, have been contracted by the fœtus in utero, furnishes conclusive evidence of the occasional transmission of disease from the mother to the fœtus. In the higher grades of miasmal fever, particularly in yellow fever, miscarriage is by no means uncommon; and in many instances of this kind, the child is born dead, and often with evident marks of having died several days previous to its expulsion from the womb. It is nevertheless probable that the influence of maternal disease, or of injurious causes acting through the mother's system on the fœtus, when not sufficiently powerful to excite abortion, is generally confined to the production, rather of organic feebleness and predisposition to disease, than to any active state of morbid excitement or positive malady. Be this as it may, the liability of the child to injurious impresssions, during its uterine existence, is abundantly verified by observation; and experience and reason justify the conclusion, that the welfare of the fœtus, in relation both to its physical and moral conditions, is intimately connected with the health and regularity of the maternal system—and consequently, so far under the control of the mother, as she may have it in her power, to avoid the sources of disease and inordinate excitement.

I. *Of the dietetic regulations proper during pregnancy.*—The peculiar tendency to febrile irritation and general plethora, so apt to accompany pregnancy, renders it especially proper to avoid the sources of undue excitation and nourishment during this period. The sensibility of the stomach, too, almost always

undergoes peculiar modifications; and the remarkable activity of its sympathies, more especially with the uterine system, attending most instances of pregnancy, presents us with an additional reason for the adoption of proper dietic regulations during the progress of gestation.

It is not to be inferred, indeed, that the pregnant female unless labouring under some disease, is to be dieted like a valetudinarian; but admitting a substantial and adequate diet, we are nevertheless warned by experience, to enjoin that moderation and simplicity of food, which would always be best, but which is now especially proper; and to caution against the free use of heating or particularly stimulating ingesta. As the appetite is frequently very craving in pregnancy, an inordinate indulgence in rich and high seasoned food is among the most common errors of females during this period. This error is the more apt to be committed, from the erroneous idea which many entertain, that, as the fœtus in utero draws its nourishment from the maternal system, a greater quantity of aliment is required in pregnancy than is necessary in the unimpregnated state. Dr. Dewees, in his work on the diseases of children, has placed the fallacy and injurious tendency of this opinion in a very strong light. The eight or ten pounds of animal substance which goes to the composition of the fully developed fœtus, being gradually drawn from the mother during a period of nine months, can not, surely, require any particular increase in the nourishment taken by the mother—more especially, "as almost every individual habitually takes more food, than is required for the regular support and health of the system."

The evils which are liable to result to pregnant females from errors in diet, are various and often exceedingly distressing. Where a predisposition to abortion exists, the free use of very nourishing and stimulating articles of diet, may give rise to this accident, simply by favouring the usually prevailing tendency to general plethora and fever. The occurrence of indigestion and gastric irritation, also, is particularly calculated to produce serious consequences in pregnancy. I have known several instances where the use of indigestible and irritating articles of food gave rise to the most alarming irritation of the stomach and bowels, attended with severe vomiting, and followed very speedily by abortion. In one case, a young married woman, in the fourth month of her first pregnancy, was seized with excruciating and obstinate dyspeptic colic, soon after she had eat freely of some very indigestible food. Notwithstanding the great risk and suffering which she had undergone from this attack, which she could not but refer to its true cause, and while her stomach was still weak and irritable, the strong cravings of her appetite led her, in about ten days after, to commit a similar, but still more glaring error. The consequence

was, another violent attack of colic, followed immediately by inflammation of the bowels, which in the course of the second day terminated in abortion, and on the following day in the death of the patient.

The exercise of caution, in the selection of proper food for pregnant females, appears to be particularly important towards the termination of gestation. The occurrence of gastro-intestinal irritation and dyspeptic colic, at this period, besides its tendency to excite miscarriage, seems to be particularly favourable to the supervention of peritonitis, after the delivery of the child. There is another circumstance in relation to this subject, which appears to be well entitled to attention. There is a chronic form of intestinal irritation, which results from the impression of vitiated secretions, or unnatural and inordinately accumulated fœcal matter, and which, though not often manifested by any very conspicuous morbid effects during gestation, often exerts an alarming and fatal influence on the system, within a short period after parturition has taken place. A redundant, mixed, heterogenous, and not sufficiently digestible diet, is especially apt to lead to this condition of the bowels, where the digestive functions are not very vigorous, and the alvine evacuations insufficient. The consequences which are liable to result from intestinal irritations of this kind, are: great prostration; puerperal convulsions; alarming nervous affections; severe head-ache; pain in the lower part of the abdomen; inability to sleep; and a peculiar and highly dangerous affection, resembling puerperal fever, characterized by a remarkable sinking of the vital energies. That the liability to this very alarming form of puerperal disease, is greatly enhanced by errors in diet,—more especially by excess in the quantity of food taken, during the later stage of gestation admits of no doubt. I have witnessed several instances in which the correctness of this observation seemed to me very strikingly exemplified. A lady who had enjoyed unusually good health previous to her pregnancy, but who could not be restrained from indulging her appetite to an improper extent, became affected with severe and painful diarrhœa, about the middle of the last month of gestation. By the adoption of proper dietetic regulations, and the employment of suitable medicines, the disease subsided in the course of seven or eight days. A few days, however, before the termination of the pregnancy, she indulged to excess in eating plum-pie with a full proportion of strong cheese, "to help the stomach to digest" the farrago she had swallowed. Diarrhœa was re-excited; and in a few days after she was delivered of a healthy child. On the second day after parturition, she experienced a slight chill, followed speedily by symptoms simulating puerperal fever, attended with irresistible prostration and sinking of the vital energies, which

terminated in death on the fourth day. These violent and dangerous effects of intestinal irritation are, fortunately, not very common; but there are many other affections of a discomforting, and often distressing character, which are rarely entirely escaped, by those who neglect a prudent attention to dietetic observances. Flatulency, acid eructations, pains in the stomach and bowels, cephalalgia, hysteria, diarrhœa, a feverish and restless state of the system, depression of spirits, palpitations, not to mention various other disturbing affections, are among the ordinary consequences of a habitual disregard of proper regulations, in relation to the diet. The pregnant female who observes a suitable regimen, will *cæteris paribus*, always enjoy more tranquility both of mind and body, and incur much less risk of injury to herself and child, than she, who giving a free rein to her appetite, indulges it to excess, or in the use of improper articles of food.

With regard to the particular dietetic regulations proper during pregnancy, it may be observed that *moderation* and *simplicity* in diet, are in general of more importance to the health and comfort of the female, than any very cautious selection as to the kind of food. This remark is more especially applicable to females enjoying a good state of health or who are free from any particular derangement of the digestive functions. A healthy female may, without risk of injury from this source, continue to take the same kind of nourishment during gestation, to which she was accustomed, and by which her health was maintained previous to the occurrence of pregnancy. Where the digestive powers are very active and there exists a decided tendency to plethora and febrile excitement, however, it will be proper to avoid the more stimulating and nutritious articles of food. In such cases, a diet consisting principally of the more digestible kinds of vegetable aliment should be selected, and all heating or strong stimulating drinks rigidly avoided.

In cases attended with a weak and irritable state of the stomach, a continued attention to the selection of suitable articles of nourishment is particularly important. In instances of this kind, the most distressing and alarming consequences are apt to result from errors committed in this respect. The necessity of enjoining uninterrupted attention to the choice of proper articles of food, when the digestive organs are in this condition, is the more urgent, from the circumstance that in cases of this kind, the appetite is frequently very craving and capricious, requiring a degree of resolution and forbearance which is seldom witnessed, until actual suffering gives efficiency to the counsels of prudence and experience. In general, such cases require the management proper in dyspepsia. Mild, unirritating, digestible and adequately nourishing food, must be selected. Rice, barley, arrow-root, oat-meal,

milk, the lean parts of mutton, lamb, venison, tender beef, soft-boiled eggs, stewed apples and peaches, constitute appropriate articles of nourishment in such cases. It should be observed, moreover, that moderation in eating, as well as simplicity in the variety of the articles of food, are indispensible to the comfort and health of the patient under these circumstances. It matters not how suitable the diet may be as to its character; much, if not all the advantage which might result from it, under a temperate use, will be prevented, if it be taken in larger portions than the stomach is capable of digesting. Coffee and tea, when not made very strong, seldom give rise to any obvious inconvenience or disorder, and may in general, be used with perfect propriety during the period of gestation, by females enjoying an ordinary state of health. In subjects of a decidedly nervous temperament, however, or in such as are labouring under a morbidly irritable state of the nervous system, the use of strong coffee, and more especially of strong green tea, should be interdicted as a habitual beverage at meals. In such cases, black tea or well prepared chocolate, may in general be taken with entire safety. Milk, more or less diluted with water, is also an excellent drink in habits of this kind. With regard to vinous or alcoholic drinks, it is scarcely possible to reprobate their habitual use, in terms of censure sufficiently strong. Excepting as mere medicinal agents, regularly prescribed, they ought to be wholly and most rigidly avoided by pregnant females. The temptation, as Dr. Dewees very truly observes, to taking small portions of cordial or brandy, in the early months of gestation, is often very strong. The annoying sensations frequently experienced in the stomach, and the general uncomfortable feeling connected with them, are, usually, allayed or moderated for a time, by the use of these potent stimuli. The unpleasant feelings, however, return, and recourse is again had to the assuaging but insidious stimulus; and thus it is taken again and again, in still increasing portions, until the deplorable habit of solitary dram-drinking is formed, and the health, happiness, and character, of, perhaps, an otherwise amiable and excellent being, immolated to the filthy and devastating demon of inebriety. The frequent or habitual use of spirituous drinks, is particularly apt to favour the occurrence of abortion. In the course of my practice I have met with some very striking exemplifications of this fact. A lady, who, after the birth of her first child, became deeply imbued with this lamentable vice, aborted four times in succession. She then, by the earnest and unremitting exertions of her friends, seconded by her own efforts, succeeded in throwing off the habit of intemperance, and in the course of the following ten years gave birth to four children. These children, however, were remarkably feeble and sickly from their birth, and one only,

out of the four, is now living—about six years of age, and manifestly of a very delicate and infirm constitution. Examples of the very ruinous effects of habitual intoxication on the health and life of the fœtus in utero, are unfortunately, but too common. The majority of children born of decidedly intemperate mothers, are weak and sickly, and but few of them arrive at the age of adolescence. Many females appear to think, that although these and other melancholy consequences, follow in the train of habitual intemperance, it is extremely improbable that any injury can result to themselves or the fœtus, from the occasional use of small portions of spirituous liquors. Were it indeed absolutely certain, that the use of such potations, would always be restricted to occasional small portions, the indulgence would perhaps, rarely occasion any serious consequences. But as no prudence and resolution can be safely regarded as an entire protection against the gradual formation of the habit of intemperance, where such drinks are occasionally taken during gestation, even though it be at very considerable intervals and in very moderate quantities at first, it is far the safest plan, to abstain wholly from every kind of spirituous liquors. The propriety of total abstinence, is the more obvious, from the undeniable fact, that whatever temporary melioration of the feelings which may, at times, result from the use of spirituous drinks, they very frequently contribute, ultimately, to increase the infirmity or mischief for which they were taken.

Before leaving this part of the present subject, it will be proper to make a few remarks upon that remarkable irregularity of the appetite, or "*longing*," as it is called, which many females experience during pregnancy. The appetitive sensibilities of the stomach undergo so much derangement in some instances, that articles of food, which previous to the occurrence of pregnancy were very grateful and congenial, become highly disagreeable, and an almost irresistible craving for unnatural and even disgusting substances is experienced. In general, this aberration of the appetite. is more apt to occur in weak and delicate females of a nervous temperament, than in such as are of a robust and full habit of body. Different opinions have been expressed with regard to the probable influence, which entirer resistance to these vehement longings or disppointment in satisfying them, may have on the mother and fœtus. It is not unreasonable to presume, that the strong mental affection which may be caused by disappointment in this respect, may exert an unfavourable influence on the health of the mother and child, more especially in very nervous and excitable females. Disappointment, and its consequent moral affection, from this source, however, has nothing peculiar in its influence, and can be no more injurious in its reaction on the

system than an equally strong emotion of the mind, from any other source of disappointment or frustrated desire.

If the substances longed for be not evidently of an injurious character, they should not be withheld. The mind is always more or less tranquilized by gratification, and, unless the indulgence be carried to an immoderate extent, it will very rarely occasion any particular disturbance. It is very remarkable, indeed, that even unwholesome articles, seldom give rise to any particular inconvenience or disturbance in the system, where there is a very urgent and persisting desire experienced for them. Still it would not be prudent to trust too much to this power of the stomach to resist the injurious impressions of the substances it calls for; and whenever the appetite is thus directed upon articles of an offensive or hurtful nature, means should be used to divert it and determine it to more suitable alimentary substances. In some instances, these "longings" must be regarded as instinctive calls of the stomach, favourable to the health of the individual. If they are not gratified, langour, inquietude and other symptoms of deranged health, will be very apt to supervene. Thus when a strong desire for eating chalk, charcoal, clay, &c. is manifested, we are admonished that the digestive powers are feeble, and that there exists a prevailing tendency to acidity in the stomach. In such cases, the appropriate means of relief are alkalines, mild laxatives, and tonic vegetable bitters, with a suitable regimen. Magnesia in combination with some vegetable bitter, or the bi-carbonate of potash with small portions of aloes, or rhubarb, so as to procure one or two free alvine evacuations daily, seldom fail to procure some advantage. If the tongue is bitter and clammy, small doses of blue-pill, with an occasional mild purgative, and moderate portions of sulphuric or nitric acid, three or four times during the day, will tend to bring the stomach back from its aberrations, to a more healthy tone of feeling. It is not common, however, to find these irregular determinations of the appetite so strong or so decidedly injurious in their tendency, as to require any particular medical attention; and we rarely meet with instances which may not be moderately indulged, without injury or inconvenience to the system.

II. *Of the proper regulations in relation to dress and exercise.*—This is a most important subject of attention to females during the period of gestation. Some of the prevailing customs in relation to dress, are so obviously improper during pregnancy, that it would seem very strange that there should be any difficulty in procuring their temporary rejection by females in this condition, did we not know that the imperious commands of fashion are often more sedulously obeyed, than the dictates of humanity and of self preservation. The custom of wearing tightly laced corsets during

gestation, can not be too severely censured. It must be evident to the plainest understanding, that serious injury to the health, both of the mother and child, must often result from a continual and forcible compression of the abdomen, whilst nature is at work in gradually enlarging it, for the accommodation and development of the fœtus. By this unnatural practice the circulation of the blood throughout the abdomen is impeded—a circumstance, which together with the mechanical compression of the abdominal organs, is peculiarly calculated to give rise to functional disorder of the stomach and liver, as well as to hæmorrhoids, uterine hæmorrhage and abortion. The regular nourishment of the fœtus, also, is generally impeded in this way,—a fact which is frequently verified in the remarkably delicate and emaciated condition of infants, born of mothers who have practised this fashionable folly during gestation. It may be observed, that since the custom of wearing tightly laced corsets has become general among females, certain forms of uterine disease are much more frequent than they were, previous to the re-introduction of this fashion. My experience has satisfied me, that leucorrhœa and prolapsus uteri, are vastly more common at the present day, among *unmarried* females, than they were sixteen or eighteen years ago. It is indeed astonishing, that these disorders are not more frequent even than they appear to be; for we can not conceive of any cause more directly calculated to produce them, than the prevailing practice of pressing the abdominal viscera down upon the womb, and thus forcing it out of its natural position, into the lower part of the pelvis, where the irritation it causes, gives rise to leucorrhæal discharge. Struve observes, in relation to the injurious tendency of wearing corsets during gestation, "that the parts which have suffered from constant pressure, become debilitated and incapable of co-operating in the important function of parturition; so that the passage of the child is endangered, the labour rendered more tedious and painful, and all the operations of nature retarded." The pressure of corsets, moreover, must tend to debilitate both the mother and infant, by impeding the function of respiration, and preventing in some degree, the regular decarbonization of the blood. Struve cautions pregnant females against an error, which is not likely to be committed in the present mode of dressing—namely, "to avoid wearing a number of *heavy petticoats*, by which the abdomen may be depressed, and a bad position of the fœtus produced. At the present day, it is much more necessary to caution against the opposite impropriety, of using insufficient clothing to protect the body from the injurious influence of cold and atmospheric vicissitudes. The abdomen and feet especially, should be guarded against injury from these causes. In the winter or cold and damp seasons, the use of a broad flannel or bandage or roller round the

abdomen, is very useful in this respect, and may be beneficial moreover, by the uniform support which it affords to the abdomen and its consequent tendency to obviate any unfavourable obliquities in the position of the womb, in the advanced periods of gestation.

The exercise which it may be proper to use during pregnancy, must of course, vary according to the period of gestation, and the particular condition of the female in relation to constitutional vigour, predisposition to abortion, and other affections, previous habit, and temperament. All kinds of "agitating exercise, such as riding in carriages with rapidity over rough roads, dancing, lifting, or carrying heavy loads, in short, all masculine and fatiguing employments whatever," ought to be avoided by pregnant women. The propriety of avoiding agitating and fatiguing exercise, increases in proportion as gestation approaches the term of its regular completion. During the eighth or ninth month of pregnancy, unusual corporeal exertion or fatigue, is particularly apt to excite premature labour; and where this accident has once taken place the necessity of observing proper caution in this respect, in subsequent pregnancies, is peculiarly urgent. In all instances, where a predisposition exists to abortion at any particular period, it is scarcely possible to prevent its occurrence, unless the utmost degree of care is taken, to avoid exciting or fatiguing exercise, about the time when this accident is apt to take place.

In weak, excitable, and nervous females, and in such as are of an unusually plethoric and irritable habit of body, it is particularly proper to observe suitable precautions, in relation to exercise and corporeal exertion. It is to be observed, however, that if injury is apt to result from *too much* exercise and agitation of the body, there is reason also for apprehending injurious consequences from too much indolence and inactivity. Moderate and gentle exercise is generally decidedly salutary during gestation, and should not be neglected unless some particular reason exists for maintaining a state of rest and bodily composure. Riding, in an easy carriage, on even roads, or moderate walking, may be enjoyed with great propriety, and usually with obvious advantage during gestation.

III. *Of moral influences.*—Tranquility and cheerfulness of mind are always highly favourable to the health and regular operations of the animal economy. In pregnancy, the importance of a calm and even temper is especially great; for the re-action of mental agitation or depression, is capable of producing very unfortunate impressions, both upon the mother and fœtus. Violent anger, terror, or jealousy seldom fail to produce unpleasant effects during pregnancy; and the consequences are, sometimes, very alarming, and even fatal. Convulsions, severe paroxysms of hysteria, spasms, syncope, insensibility, hæmorrhage, and abortion, may be pro-

duced by moral influences of this kind. Not more than ten months ago, I witnessed the occurrence of hysteric convulsions followed, in the course of a few hours by abortion, in consequence of a fit of vehement rage from jealousy. But even when none of these violent affections result from the more agitating emotions, there are various minor evils of a discomforting and distressing character, which are apt to occur during pregnancy from moral influences of this nature. The functions of the stomach, the heart, the liver, and of the brain itself, are strongly influenced by the mind. The depressing moral affections often exert a highly injurious influence on the organization, particularly on the digestive and biliary organs. Debility, indigestion, jaundice, emaciation, with various other functional disorders, and even organic affections, are frequently produced by emotions of this kind; more especially by intense and protracted grief, and mental distress. Unfortunately no effort of the will, or firmness, is always adequate to avoid these distressing affections of the mind. The accidents and misfortunes to which all are liable, sometimes bring grief, and sorrow, and distress, with a force which cannot be sufficiently resisted. There are, however, other causes of mental disturbance, which are more under the control of well constituted minds; and which are almost as detrimental to the welfare of both the mother and child, as the moral affections just referred to. Fretfulness and moroseness of temper; envious and jealous feelings, peevishness, hatred, discontent, obstinacy and perverseness of disposition, are under the subjection of reason and a sense of propriety. It is of great importance to the regular progress of gestation and to the well-being of the mother and fœtus, that every effort which good sense and moral feeling dictate, should be steadfastly made by pregnant females, to keep down these injurious and degrading sentiments and irregularities of temper.

The *maternal imagination* has been accused of producing the most extraordinary effects on the fœtus in utero. During the early and middle ages, it was almost universally believed, that malformations, moles, and other unnatural appearances, were very generally produced by the influence of the imagination of mothers; and the opinion continued to prevail with many reflecting and well informed physicians, until within a comparatively late period. A multitude of pretended examples of this kind, are on record—many of which are of a character so strikingly preposterous and impossible, that they can now be regarded only as extraordinary and humiliating instances of human credulity. We are told, that black children have been born of white parents, in consequence of the maternal imagination having been excited by contemplating the portrait of an Ethiopan, and the same effect has been produced, according to some statements, in consequence of preg-

nant females having contemplated with interest the portrait of an Ethiopian, or having been frightened by a black man. Damascenes assures us, that he saw an infant born with the whole of its body covered thickly with coarse black hair, caused, as he states, by the mother having frequently looked at an image of St. John dressed in a bear's skin. A child was born at Blois in France, with the iris of one of its eyes accurately representing the dial-plate of a watch, in consequence of the mother having experienced a very strong desire to have a watch, which from some cause or other could not be gratified.

Absurdities of this gross and glaring character are now but little entertained even by the most superstitious and ignorant. There are still, however, some, who fancy that under strong excitement the imagination is capable of producing indelible impressions on the body of the fœtus in utero. It is not very uncommon, to hear moles, marks, and various other blemishes and malformations ascribed to mental influence. Apprehensions of this kind, sometimes seize on the minds of females, with irresistible force; and they often occasion great anxiety and unhappiness during gestation. With weak, ignorant and superstitious females, every unexpected occurrence, that happens to strike them with sudden alarm, or produces any particular excitement of the imagination, is apt to impress them with alarming apprehensions, as to the effects it may have on the development and conformation of the child in the womb. These distressing illusions are generally much increased by the many ridiculous stories of moles and malformations, occasioned in this way, which seldom fail to reach the ears of those who are predisposed to listen to them; for nurses, and gossiping old women, are usually furnished with an ample stock of extraordinary examples of this kind. The evidences upon which such tales are generally founded are never wanting. If a child is born with some blemish on its body, the mother is forthwith closely questioned as to the circumstances which may have attracted her particular attention or excited her mind by sudden surprise or alarm. If any thing of this kind is recollected which bears even a remote similitude, in colour, shape, or otherwise, to the mark or defect observed on the child, it is immediately put down as its indubitable cause. Sustained by authorities of this kind, these absurd apprehensions often acquire an ascendency over the minds of pregnant females, which no expostulation or ridicule can entirely subdue, and which sometimes give rise to the utmost degree of anxiety and distress of mind, and occasionally even to physical suffering and ill-health.

I do not propose to enter into a formal refutation of this erroneous and injurious notion. It is now unreservedly rejected as the fantastic offspring of ignorance and superstition, by all sensible,

observant, and reflecting physicians; and it is much to be desired that it should be equally repudiated, by those whom it more especially concerns, and upon whose happiness and well-being, it tends to exercise so injurious an influence.

But, although the idea that structural blemishes may be produced by the influence of the mother's imagination, is wholly without foundation, yet it can scarcely be doubted that injurious impressions may be made, in an indirect manner, on the child in the womb, by affections of the maternal imagination. If intense and protracted grief, or violent bursts of passion may exert a detrimental influence on the fœtus, we may presume that similar injurious effects may result from strong affections of the imagination. It is well known that disease and even death is sometimes produced by intense excitement and concentration of this mental faculty; and it is equally notorious that severe and long-standing maladies are often effectually removed by its powerful agency. It is evident, therefore, that the fœtus in utero must be liable to injurious impressions from inordinate affections of the maternal imagination; for without presuming that the mental affections of the mother can exert any direct and immediate impressions on the system of the fœtus, the diseases and functional disturbances to which the mother is liable from influences of this kind, must tend, in some degree, to interfere with the regular nourishment and health of the child. Every kind of mental excitement, when excessive, may prove detrimental to the health, both of the mother and the fœtus; and it is probably as important, to guard against the ascendency of an excited imagination, as against the various agitating and depressing emotions already mentioned.

IV. *Of blood-letting during pregnancy.*—Females very generally suppose that the condition of pregnancy is, of itself, a sufficient reason for blood-letting; and that, although unaccompanied by any circumstances, which might be justly deemed an indication, for this evacuation, it is necessary, both for the preservation of the mother's health, and the safe progress and termination of gestation. This is a very erroneous opinion, and often leads to decidedly prejudicial consequences. Pregnancy is, indeed, generally attended with a very peculiar tendency to plethora and febrile excitement; and, it may be admitted, that even in a state of apparent good health, blood may often be drawn during pregnancy with a beneficial result. In such cases however, the pulse and other manifestations of general plethora, indicate the propriety of depletion; and unless these or some other symptoms calling for the abstraction of blood be present, it cannot be practised without the risk of unfavourable consequences. When the symptoms of vascular repletion are not very urgent, the plethora may, in general, be much more beneficially

removed, by using a less nutritious and stimulating diet, than by blood-letting. By the former mode, we not only diminish the mass of the blood, but we generally also improve the condition of the alimentary canal, and thereby contribute sensibly to the comfort and health of the patient. In weak, nervous, and relaxed habits, even where the manifestations of vascular fulness are conspicuous, the loss of blood, sometimes, occasions much debility, and may even contribute to the occurrence of abortion.

Pregnant females should not resort to blood-letting, unless manifest indications exist for its employment; and, as they cannot be competent judges themselves, of the presence or absence of such indications, the advice of a physician ought always be procured before recourse is had to this measure. To bleed merely because pregnancy exists, is a practice which is sanctioned neither by reason nor experience, and ought to be discarded as a custom calculated to do mischief in some cases at least, whilst it cannot do any good, unless called for by other circumstances than the condition merely of pregnancy.

A very severe and troublesome pain is often experienced in the right hypochondrium during the latter period of pregnancy; and this suffering is, almost always, sought to be mitigated or removed by blood-letting. When decided evidences of plethora accompany this painful affection, bleeding will occasionally procure considerable temporary relief; but in the majority of instances, no mitigation whatever is obtained from this measure. The relief which is sometimes procured by bleeding, is always of short duration, the pain usually returning in the course of two or three days; and if the bleeding is thus frequently repeated, as is sometimes done, much mischief is apt to be produced, by the general debility and languor which it tends to occasion. When the symptoms of vascular turgescence throughout the system are conspicuous in connection with this pain in the side, it will certainly be proper to diminish the mass of the circulating fluid by *vene-section;* but where no indications of this kind are present, blood ought not to be abstracted merely on account of this affection; for it will most assuredly fail of procuring the desired relief; and may, when not particularly called for, operate unfavourably on the general health of the patient. Moderation in diet, together with a proper attention to the state of the bowels, and the use of gentle exercise by walking, will, in general, do much more towards the removal of this source of uneasiness and suffering, than will result from blood-letting, where this evacuation is not especially indicated by the fulness and firmness of the pulse, or by other manifestations of general vascular plethora.

The breasts and nipples should be particularly attended to during the latter months of gestation, in order to prepare them for the important function of suckling the infant. To prevent the nipples from becoming excoriated and inflamed, in consequence of the irritation occasioned by the child's lips and tongue, in the act of sucking, means should be used, some weeks before the expected termination of gestation, to render them firm and to diminish their sensibility to irritating impressions. For this purpose the nipples should be daily washed with luke warm water, then dried by exposing them to the free air, and afterwards gently rubbed for five or six minutes with a soft piece of flannel or with the extremities of the fingers. Much benefit may also be obtained, from the occasional application of a pup to the breasts during the last four or five weeks of gestation. Washing the nipples with brandy and water, and with various stimulating lotions is a very common practice; and where the skin of the nipples is very delicate and sensible, considerable benefit may, at times, be derived from such applications. Dr. Dewees, however, is decidedly opposed to the use of astringent washes, for the purpose of preparing the nipples. My own experience, does not lead me to apprehend any detriment from certain applications of this kind; on the contrary, I have been constantly in the habit of directing the use of a wash, composed of two drachms of the tincture of myrhh diluted with two ounces of water, with a drachm of laudanum; and in general the effects have been manifestly advantageous. The nipples should first be bathed in luke warm water, so as to soften and separate the indurated cuticle, then dried, and gently rubbed with soft flannel, as has just been stated, and afterwards washed with the lotion just mentioned. If this course is pursued daily, for several weeks previous to the birth of the child, it will, in general, obviate all difficulties in this respect. Compression of the breasts by corsets, tight jackets, and stays, during pregnancy, is calculated to interfere very materially with the function of lactation. The almost constant pressure which is thus made on the nipples, forces them inwards, and frequently buries them in the yielding substance of the breasts, so as to render suckling very difficult, and often wholly impracticable. The full and regular development of the mammary glands too, is doubtless much impeded by the pressure which they suffer in this way. It is well known that compression is a very powerful means for promoting absorption; and surgeons often avail themselves of this measure, for reducing glandular and other enlargements on the external parts of the body. We could indeed scarcely adopt more effectual means for restraining the natural growth and development of the breasts than tightly laced jackets, stays, and corsets; and it is, doubtless, to this circumstance that we must ascribe the flat and unfeminine breasts which are so

common among the young females of the present day. I have been frequently struck with the fact, that in the country, and among the lower classes of females, who do not compress their chests, by corsets, &c. we generally find a much greater proportion of full and well developed bosoms than in cities and among fashionable ladies.

When the nipples are very small or have been forced inwards by the pressure of corsets, &c., they should be drawn out by means of a suction pump, or with a tobacco pipe, and all undue compression of the breasts carefully avoided. One of the white earthen tobacco pipes, with a large bowl will in general answer this purpose very well. The effort of drawing the nipples out, should be repeated several times daily, until they have acquired a degree of prominency which will enable the child to lay hold of them without difficulty.

CHAPTER II.

OF THE MANAGEMENT OF NEW-BORN INFANTS.

The proper management and nursing of the infant during the first few weeks after its birth, has a most important influence on its future well-being. Previous to its entrance into independent life, the child enjoys a tranquil state of vegetative existence, removed from the multifarious influences of external causes, with but a narrow circle of organic actions to perform, and its sensorial functions in a state of total inactivity. How great the change which takes place at birth! In a moment, a multitude of new and highly important relations, are established between its tender and uninured organization, and the countless objects of external nature. Functions and operations which, up to this period, lay passive and dormant, are now suddenly called into action; and the whole machinery of its system, starts forth in the performances of the harmonious series of vital actions. The air for the first time, comes in contact with its body—it rushes into the cells of the lungs, and respiration is established; the current of the circulation finds new channels, and abandons those which were previously the principal conduits of the vital fluid. The senses are awakened, light strikes the eyes, sound the ears, and its taste is delighted with the simple nourishment, formed for it, in the

maternal bosom; the sense of touch is acute, it feels the variations of temperature, and is keenly susceptible of pain from injurious impressions, and gratification from soothing and agreeable influences. The stomach begins to exercise its instinctive calls for nourishment; urine is secreted, the bowels begin to act, and to eliminate their fœcal contents, and the various secretions subservient to digestion are established. When we contemplate this remarkable transition of a most helpless and feeble being, from a state of repose and almost total exemption from external impressions, to a mode of existence which subjects its tender and uninured organization to the ceaseless influence of a vast multitude of varying agencies, it would seem truly surprizing, that the new-born infant could prolong its existence, even for a few hours, did we not know that the benovolent author of nature, has endowed every being, with powers adequate, under ordinary circumstances, to sustain the changes and modifications which it is destined to undergo in the progress of its development from the nascent point, to the full state of adult life. It is evident, however, that this power of accommodation can afford no protection against the numberless accidental and unnatural impressions which the new-born infant is liable to suffer; on the contrary, there is no period of life, in which there exists so great a susceptibility to injurious influences, as during the early stages of infancy. Apparently slight errors during the first few weeks after birth, often lay the foundation of permanent constitutional infirmity; and much suffering or early death, is but too common a consequence of improper management in relation particularly to the diet, dress, and exposure of the new-born infant.

I. *Of the washing and dressing of the new-born infant.*—When the infant is born, and the function of breathing is well established, it must be carefully separated from the mother and secundines, wrapped up in a piece of soft flannel and handed to the nurse. If the child breathes feebly and imperfectly, or exhibits other signs of great feebleness it should not be washed immediately, but suffered to remain as quiet and undisturbed as possible, until the vital actions have assumed some degree of activity. When on the contrary it manifests an active state of the vital powers, the washing should be performed as soon as convenient after its separation from the mother. It is of importance that this duty should be carefully and thoroughly executed. The white caseous substance which is deposited on the surface of the fœtus, during its sojourn in the womb, adheres very closely to the skin; and as it is wholly insoluble in water, and but very slightly acted on by soap, it can never be sufficiently removed, unless some other substance is employed which has the property of rendering it soluble. For this purpose, lard, or fresh butter, or the yolk of eggs may be

used. Before any water is applied to the child's body, the skin should be smeared and gently rubbed with one of these substances; after which the whole may be readily washed off with warm water and soap. Dr. Dewees advises that the *finest* soap should be selected, for the stronger soaps, particularly "the brown and stimulating soap, called *resin soap*," is apt to irritate and inflame the tender skin of the infant, and to give rise to painful and protracted abrasions of the cuticle. When the yolk of eggs is used for this purpose, soap is altogether unnecessary, simple warm water being sufficient to cleanse the surface thoroughly. It has been much disputed whether warm or cold water is most proper for the first ablutions of the infant. Under an impression that the use of cold water is calculated to invigorate the infant, and to inure it early to vicissitudes of atmospheric temperature, and thus to obviate, to a degree, the liability to disease from this source, many physicians have strenuously insisted on the superiority of cold over warm water for this purpose. Although there may appear to be some justice in these views, yet general experience is at present decidedly in favour of the employment of warm water for washing infants; and a correct view of the circumstances connected with this subject, gives it also, the decisive sanction of reason and common sense. The infant having never experienced but one uniform degree of temperature, during the whole period of its uterine existence, cannot but receive a painful and often injurious shock when suddenly subjected to the application of cold water; and it cannot be doubted, that the immediate exposure of new-born children to cold air or water is frequently productive of serious maladies. Were an adult confined for nine months to an invariable temparature of 98°, and then suddenly ushered into a medium of the temperature of 60°, is it not extremely probable that it would prove highly detrimental to his health? The occurrence of disease from much less remarkable vicissitudes than the one just supposed, is a matter of almost daily experience. How then can it be reasonably contended that the delicate, feeble, and uninured organization of the new-born babe, should be capable of bearing such a transition without experiencing any injurious impressions. Indeed, the struggles, the pale and contracted skin, the shrieks, and the trembling which we often witness when the infant is plunged or washed in cold water, afford sufficient evidence that painful, and we may presume, injurious impressions are made on its system. The propriety of using warm water is particularly urgent when the infant is feeble. Doubtless, with robust and vigorous infants, a salutary reaction often speedily takes place, under the depressing influence of cold ablutions; but where the vital energies are feeble, the reaction may fail, and a degree of depression be produced, which may place the life of

the infant in imminent danger. Instead of abstracting heat, we find it much more congenial to the infanticile system to impart a moderate degree of warmth from without; and with very delicate and feeble infants the constant application of a comfortable degree of warmth is particularly important. The water used for washing healthy and vigorous infants should be *luke-warm;* but for such as are weak, water of a higher temperature will be proper, and in cases of extreme feebleness, a small portion of wine may be advantageously added to the water. To remove the unctuous matter already mentioned, a fine and soft cotton or flannel rag should be used for washing. This peculiar substance is in general, most abundant in the folds of the joints, particularly in the groins, and armpits; and it is particularly important to the health and comfort of the child, that every particle of it should be removed from these and other parts of its body. It is sometimes impracticable to remove the whole of this matter from the folds of the skin and joints at the first washing, without causing too much irritation by the rubbing, which it is necessary to use to detach it entirely from the skin. When this is the case, the portion that remains may be removed at the second washing.

Many are in the habit of bathing the head of the new-born infant, with brandy or some other spirituous liquor, in order as is imagined, to invigorate its system and fortify it against the injurious effects of cold and other causes of disease. This practice can serve no useful purpose; and as it may do mischief by over-exciting the system as well as by causing pain and inflammation of the eyes, it ought to be abandoned. When the infant is very feeble and languid, a small portion of some stimulating liquor may be added to the water in which it is washed; but unless such a special reason for stimulating applications be present, plain water is decidedly the most proper. After the child has been thoroughly washed, it should be well dried, and immediately dressed. Throughout the whole period of infancy the utmost attention should be paid to keeping the child's body in a state of perfect cleanliness. The ablutions should be performed every morning and evening, though in the evening, the lower half of the body only need be washed. It is also a matter of very great consequence to the comfort and health of the infant to keep every part of its body dry. This is particularly important with those parts which are subject to friction, from being in contact with each other; as the nates, the armpits, groin, folds of the neck, &c. Excoriations and painful inflammations are apt to occur in these situations, when they are suffered to remain wet or moist. The common practice of dusting fine starch or hair-powder over the body, with the view of keeping the skin dry and soft, is improper, and ought not to be adopted. It interferes with the

regular transpiration of the skin, and has a tendency to give rise to a troublesome itching and harshness of the cuticle. On the appearance, however, of slight excoriations, a little hair-powder, or prepared tuttia may be dusted on the parts with benefit; but it cannot be used with advantage as a preventive of such affections.

II. *Of the dress of the child.*—The first thing to be done in dressing the infant, is to fix the remains of the navel string by surrounding it with a piece of soft dry rag, and supporting it in a proper position, by means of a roller or bandage, passed round the child's body. A simple strip of flannel, about four inches wide, is the best material for this purpose. Particular care must be taken not to draw this bandage too tight round the abdomen. It should be sufficiently loose to admit of the easy introduction of a finger under it. If it embraces the body too closely, it occasions uneasiness, pain, and difficulty of breathing, by impeding the co-operation of the abdominal muscles, and the free descent of the diaphragm; at the same time that it tends, very strongly, to favour the occurrence of umbilical, and particularly scrotal hernia in male infants, by its necessary effect of compressing the abdominal cavity, which, with the forcible descent of the diaphragm in the act of crying, coughing, and straining, presses the viscera down, and forces them through the natural openings into the abdominal parietes. I have repeatedly known inguinal rupture produced in this way. The bandage should be worn four or five months before it is laid aside; and where the parts about the navel appear to be weak and ready to yield to the pressure of the viscera, it will be proper to continue the use of the bandage a much longer period. Previous to the separation of the remaining piece of navel-string, care must be taken not to pull it; and the parts about the navel should be kept as dry and clean as possible. A neglect in these particulars, is apt to give rise to painful inflammation and excoriation of the umbilicus. "Sometimes the vessels of the umbilical cord, which before were distended with blood, will collapse, the bandage become loose, and the life of the babe be endangered by excessive bleeding; the state of the bandage must therefore, from time to time, be carefully examined."

With regard to the *clothing* of infants, it may be observed, in a general way, that it should be warm, light, and loose. It is scarcely necessary, to say any thing, in reprobration of the old, absurd, and injurious practice of swaddling infants. This cruel custom is now universally abandoned by every civilized people; and it is surprising that the common sense and humanity of mankind, should have ever permitted its introduction. To confine and restrain every member and almost every muscle of the body in this manner, during the fragile state of infancy, must be as detrimental to the health and regular developement of the child, as it is cruel and barbarous.

The clothing of infants should be managed in such a way, as to protect them against the effects of too high or low a temperature, and against sudden alterations of the air and weather. In the winter, or during cool seasons, flannel forms an essential part of the clothing. The lightest and softest kinds of flannel should be selected. In new-born infants of a feeble and languid habit, the use of flannel next the skin, is particularly useful. During the first few months after birth, warmth is always peculiarly congenial to the infantile system; and where from feebleness, the developement of the animal temperature is not very rapid, it is particularly necessary to use flannel clothing, so as to favour the accumulation of warmth in the child's body. Besides the usefulness of flannel as a means for obviating the depressing and injurious effects of cold and atmospheric vicissitudes, benefit may also result from its gentle stimulating impressions on the surface of the body, by which the blood is solicited to the external capillaries and unfavourable congestions obviated in the internal organs. During the warm seasons, the flannel should be substituted by muslin; but the moment that any sudden reduction of the atmospheric temperature takes place, the use of the flannel should be resumed. Common sense indeed, dictates the propriety of constantly accommodating the clothing to the varying states of the weather, and when this obvious duty is not attended to, much disease and suffering is liable to occur, which under a more prudent management in this respect, would be prevented. In the summer season, infants are often exposed to unpleasant consequences from being too thickly and warmly covered while sleeping. The infant with its usual quantity of clothing, is often laid on a bed of feathers or down, into which its body sinks, and a thick cover thrown over it; from which it is generally taken up when it awakes, bathed in a copious perspiration and of course particularly predisposed to receive injury, should it happen to be immediately exposed to a current of fresh and cool air. There can be no doubt that catarrhal and bowel complaints are frequently produced in this way. I have known a case of fatal cynanche trachealis speedily excited by carrying a child, taken out of its cradle, in a state of free perspiration, into a draught of cool air. It is proper to observe, that the child should never be suffered to sleep in the flannel which has been worn during the day and in the morning it must again be changed.

During the first eight or nine months, the child's clothes should be long enough, to extend considerably beyond the feet, in order that the lower parts of the body may be duly protected, against the effects of cold and the variations of temperature. After this age, however, the feet should be entirely unincumbered by the clothing, so as to permit the free motion of the inferior extremi-

ties. During cold weather, fine woollen stockings, sufficiently wide to be easily put on and to prevent every degree of compression, should be worn; but in warm weather light and soft flannel socks will suffice. The shoes should be made of light and pliable materials, and sufficiently large to prevent all constraint of the feet. Some writers object to putting shoes on infants. It is alleged that they tend to cramp the feet and restrain their free motion, and that consequently the child "does not learn to walk so early, as when the feet are unincumbered by shoes." These objections, however, may be obviated, "by having the shoes made large and of the most pliant materials;" and I fully accord with Dr. Dewees in the opinion, "that as shoes afford protection from cold, and security against accident when the child is placed upon the floor, especially on carpeted floors, where pins, needles, and other sharp substances, are often concealed, they can not, with perfect propriety, be dispensed with." The use of shoes is decidedly proper when the child is carried out of doors during cold weather. In very young infants, thin woollen socks will protect the feet sufficiently during the warm seasons; but when they are about learning to walk, it is best, for the reason just quoted, to have the feet invested in shoes made of very soft and light materials.

It is highly important that the child should be kept as dry as possible. Wet diapers or stockings, when suffered to remain on the child for some time, are apt to give rise to bowel complaints and febrile affections, more especially during the cold seasons. They tend moreover very strongly to favour the occurrence of excoriations, and painful irritations of the skin about the groin and nates. The under-clothes of the child should be frequently examined, and if any part is found to be wet, it should be immediately removed and substituted by a dry and clean one.

In dressing children there ought to be as few pins used as may be practicable, for the proper adjustment of the clothes. Children are frequently much injured by the points of pins being accidentally directed inwards in handling them, or by their own movements. I have witnessed several instances of very unpleasant consequences from this source; and the instances of slight but painful punctures and scratches from pins used in the dress of infants are very common. Tapes and strings should therefore be used instead of pins, whenever they can be made to answer the purpose. If pins are used at all, the larger kind should always be selected; for the small pins now in general use, are much more apt to slip through the clothes and consequently to wound the skin than the larger kind (Dewees).

Before leaving this subject it will be proper to say something concerning the usual mode of dressing children, so as to leave the

neck, upper part of the chest, and forearms perfectly bare. Whilst adults are careful to keep these parts well covered and protected against the influence of cold, children are almost universally suffered to be without such protection; and the nudity of the neck and arms is generally continued, until they are four or five years old. It has been supposed that this custom is one of the principal reasons why inflammatory affections of the respiratory organs are so much more common during the period of childhood, than at a more advanced age; and there can be no doubt that its influence, in this respect, is very considerable. Nothing is more common than to see children out of doors, with the arms and upper parts of the chest, completely exposed, even in damp and cold weather; and it cannot be believed that such exposure is unattended with risk of injurious consequences. Croup, inflammation of the lungs, catarrh, and general fever are doubtless frequently the consequences of this irrational custom; and it is not improbable that the foundation of pulmonary consumption is often thus laid, during the first few years of life. This custom, therefore, ought to be abandoned, as one of a decidedly injurious tendency, more especially during the cold and variable seasons. During the warm months of summer, the arms, and neck may be left bare, without any particular liability to injurious consequences; but every part of the chest should at all times be protected with suitable clothing. It is generally supposed that the usual mode of dressing children, is calculated to inure them to the impressions of cold, and to obviate the liability to disease from this cause. Doubtless this may be the result with those who survive the experiment; but before the system is thus inured, the child may be carried off by some inflammatory affection, produced by such exposure. It is certainly a most inconsistent practice to expose the breast and arms during the weak and tender age of childhood, and yet to deem it necessary to keep these parts carefully covered after the system has acquired firmness and its full powers of vital resistance by a more mature age.

The universal custom of covering the infant's head with a cap, is of very doubtful propriety. There is naturally a strong tendency to a preternatural determination of blood to the head during infancy; and the predisposition to inflammatory diseases of the head, is confessedly, much greater during this early age, than at any other period of life. If the rule to "*keep the head cool*," is ever applicable, it is particularly so during infancy. In cold and damp weather, a very thin and light hat may be proper; but during the warm seasons, it will be conducive to the child's comfort and health to suffer the head to be wholly uncovered; and even in winter, if the child's head is well covered with hair, and it be confined within doors, caps may be very prudently dispensed with.

CHAPTER III.

OF THE NOURISHMENT OF INFANTS.

There is probably no single source of disease, during the first few years of life, whose influence is so extensive and destructive, as improper management in relation to the diet. The foundation of irremediable chronic diseases, and of constitutional infirmity, throughout the subsequent period of life, is often laid within the first month, or even first few days after birth, by errors of this kind; and a great amount of the suffering and mortality which occurs during infancy, must be ascribed to the same prevailing source of injury and disorder. The almost universal custom of feeding children with inappropriate articles of food, very soon after birth, is extremely reprehensible. No sooner is the infant washed and dressed, than the nurse is ready with her spoon and cup of gruel, pulverized crackers dissolved in water, or some such preparation, to fill its stomach to the utmost of its capacity; and this process of stuffing is continued with a ruinous degree of diligence and perseverance. The tender and uninured digestive organs of the new-born babe are thus often seriously injured during the first twenty-four hours. Nature herself seems to point out the impropriety of this practice. She withholds the nourishment which she provides, until many hours after birth. It seems highly improbable, if it were necessary that the infant should receive nourishment soon after birth, that the appropriate alimentary fluid should be so tardily furnished. We no where find such an inconsistency in nature. It is true, indeed, that the secretion of milk in the maternal breasts is often delayed a much longer period, than it would be prudent to withhold nourishment from the infant. Still we perceive, in this arrangement, that aliment is not necessary to the welfare of the child very soon after its birth. It cannot be presumed that the activity of the digestive organs, and a demand by them for nourishment is immediately awakened, on the child's entrance into the world. We no where see a physical want established without the appropriate means being furnished for satisfying it. I do not indeed, mean to inculcate, that nourishment is to be entirely withheld from the infant until the milk is secreted; but I am persuaded, that with healthy infants,

several hours, at least, should be suffered to pass immediately after birth before any alimentary substances are introduced into its stomach; and I would most strenuously insist on the importance of exhibiting but small portions at a time, and at such intervals, as will obviate all risk of overloading or distending the stomach. This latter error is the most to be deprecated. A few tea-spoonfuls of some very bland and weak fluid, could not be deemed detrimental, though given immediately after birth; but the usual practice of filing the stomach to overflowing, and keeping it in this state of fulness and distention, is most ruinous to the health and comfort of the child. At every period of life over-distention of the stomach, by food or drink, is one of the most certain and powerful causes of indigestion; and we can scarcely conceive it possible, that the tender and uninured stomach of the new-born infant, can escape serious debility and irritation, when early overcharged with food even of the mildest kind. The digestive powers of the stomach being thus prostrated or enfeebled, all the harassing and painfal consequences of indigestion ensue. Acidity, flatulency, colic, diarrhœa, vomiting, green and griping stools, emaciation, not to mention other distressing and dangerous symptoms inevitably supervene. In nine cases out of ten, perhaps, the griping, flatulency, diarrhœa, and colic which so frequently harass infants, during the first half year after birth, are the results of indigestion, brought on by errors in diet. Not unfrequently the digestive powers are effectively prostrated by the first feeding. Conceiving that, as the child has been fasting during the long period of nine months, it must needs come into the world with an excellent appetite, and an immediate demand for nourishment, ignorant nurses—(and the ignorant are incomparably most numerous) deem it their duty, to be most vigilant and industrious in charging the infant's stomach with some alimentary substance—often extremely inappropriate. To relieve the colic, griping, flatulency, diarrhœa, &c. which ensue, recourse is had to cat-mint tea, anniseed tea, Godfrey's cordial, paragoric, or some other palliative or nostrum, and thus an additional source of gastric derangement or indigestion is brought into operation. The screams and restlessness of the infant occasioned by the griping and colic, are frequently regarded as manifestations of hunger. To appease this supposed craving, the stomach is almost constantly kept in a state of distention with food; and thus the helpless babe has no chance of escaping from the torments and ruinous consequences of its unfortunate condition. Very vigorous and healthy infants often pass through the gastric irritation and distress produced by improper nourishment soon after birth, without sustaining any permanent injury in health or constitutional infirmity. After four or five months of flatulency, griping, &c., the digestive organs gradually become inured to the impressions of the

food, and a considerable degree of health is obtained. In many cases, however, the irritation which is thus kept up in the stomach and bowels, does not pass off in so favourable a manner.—Jaundice, chronic and unmanageable diarrhœa, emaciation, slow fever, enlarged mesenteric glands, dropsy in the brain, scrofula, chronic affections of the liver, epilepsy, and other dangerous maladies, may, and not unfrequently do, result from this state of the alimentary canal, during infancy. Great distress and suffering, are sometimes witnessed during the early period of infancy, from indigestion, and consequent gastro-intestinal irritation, even where the child is wholly nourished by the breast. For when, during the time which intervenes between the secretion of milk, and the birth of the child, crude articles of nourishment are superabundantly introduced into the infant's stomach, the digestive functions are often, at once, so deranged and impaired, that even the wholesome and congenial fluid furnished by the maternal breasts, will not be easily digested; and acidity, flatulency and colic will continue to harass the child, until the digestive powers gradually acquire a greater degree of vigour.

That the jaundice of infants is generally produced by dispeptic irritation, I have not the slightest doubt. Mucous irritation of the duodenum, is now well known to be an active and frequent source of this malady; and this affection is very rarely found to occur in new-born infants without being preceded by decided manifestations of irritation of the digestive organs. Let the child's stomach be once or twice filled during the first twenty-four hours with gruel, or any of the ordinary preparations employed by nurses for this purpose, and the chances will probably be as ten to one, that acidity, vomiting, colic, griping, and jaundice will supervene. There is assuredly no period throughout the whole course of life, in which the observance of caution, in relation to the ingesta is of greater moment than in the comparatively short interval which passes between the birth of the infant, and the secretion of its natural aliment. If the powers of the stomach are not prostrated during this short interval, which by the customary mode of management is seldom avoided, and the child is fortunate enough to be nourished by its mother's milk, the ordinary gastric disturbances of infancy will rarely supervene. Alimentary ingesta, are not, however, the only sources of direct gastric irritation and indigestion at this early period of life. Much mischief is, doubtless, often done, by the means employed for removing the *meconium*. Active purgatives are sometimes given for this purpose; and there is much reason for believing that the infant's digestive functions are often injured in this manner. I have hitherto dwelled especially on the importance of withholding nourishment from the child, immediately after

birth, and before milk is furnished by the maternal breast. I am induced to be the more urgent on this point, because many who would not think of feeding the child, after the breasts supply a sufficient quantity of the appropriate nourishment, consider it necessary to do so before the milk is secreted, lest it may suffer from want of nourishment. I have already stated that there can be no objection to the exhibition of small portions of some very mild and simple fluid to the infant, previous to its receiving nourishment from the breast; and when the secretion of milk is considerably delayed, this measure will even be proper. A mixture of two parts of fresh cow's-milk, and one part of warm water approaches nearer to the nature of human milk than any thing else that can be conveniently procured. Of this a few teaspoonfuls may be given from time to time, carefully avoiding overcharging the stomach, until the mother's breasts are ready to yield their more congenial nutriment. In order to excite the early secretion of milk, it will be proper to let the child draw the breasts, for a few minutes, soon after the mother is comfortably fixed in bed, provided her health and strength will admit of it. After the secretion of milk is once fully established, and furnished in sufficient quantity, the infant should be nourished exclusively by the breast. Not even the mild and simple fluid just mentioned should be allowed, unless some special reason exist for the use of additional nourishment. It seldom occurs in healthy mothers, that the quantity of milk supplied by the breast is not sufficient to afford adequate nourishment to the child for the first two or three months, and in general much longer, without the necessity of any additional artificial food. Should it be otherwise, however, or should there be an inability of suckling the child, in consequence of the mother's ill-health, or disease of the breasts, the mixture of milk and water mentioned above, should constitute the sole aliment, until the primary teeth make their appearance; or what is still more suitable, a healthy and fresh wet-nurse should be procured.

There is no substance in nature, nor can there be any thing prepared by art, which forms so congenial and wholesome a nourishment, during the early period of infancy, as the human milk. When it is supplied in sufficient quantity, no other alimentary substance ought to be given, during the first three or four months after birth. It seems, almost superfluous to remark that nature manifestly intended this fluid, as the sole nutriment at this early stage of life. Throughout the whole range of the higher orders of animated beings, the structure of the mouth, particularly in relation to the absence or presence of teeth—their conformation, position and situation,—furnishes unequivocal indications, as to the kind of food most appropriate and salutary. The same re-

lation between the condition of the mouth, in this respect, and the kind of aliment best adapted to the welfare of the system, occurs during infancy; and an attention to this circumstance, affords a good general index, as to the kind of diet best suited to the new-born infant, and the changes which it will be proper to make according as it advances in age. The infant comes into the world with soft and toothless gums,—full and prominent lips, and an instinctive ability and readiness to grasp the nipple with its tongue and lips, and to perform the actions of suction in the most perfect manner. For a considerable time it remains wholly incapable of performing the motions of mastication. It is evidently the design of nature, that the infant shall obtain its nutriment by suction; and as the maternal breasts with their grateful and congenial lacteous fluid, correspond with this arrangement and intention of nature, it is manifest, that these constitute the only natural and truly appropriate source of nourishment during early infancy.

The infant should be nourished exclusively by the breast, until the first teeth make their appearance. No other kind of nourishment whatever, should be allowed, anterior to this period, unless from deficiency of milk or some other cause, the use of additional aliment becomes necessary. After the first teeth have come out, small portions of barley-water, thinly prepared arrow-root, or a mixture of equal parts of cow's-milk and water, may be given two or three times daily, in addition to the nourishment drawn from the breasts. I do not mean to say, that when the child arrives at this stage, it becomes necessary, or even decidedly proper, as a general rule, to exhibit any additional articles of food. In general, however, the simple and mild liquids, just mentioned, may be given at this period, with very little risk of unpleasant consequences; for the digestive organs have, by this time, acquired a degree of power and activity sufficient to obviate the painful and disturbing effects which would arise from the use of such food during the first four or five weeks after birth. I have very rarely known any ill consequences to occur, from the moderate use of the articles of nourishment just mentioned, at this period of infancy; and I am satisfied, that when the breasts do not furnish a sufficiently copious supply of milk, they may, in general, be resorted to, with perfect propriety. It is particularly important however, when additional aliment is used, to avoid overloading the stomach; for over-distention, seldom fails to impair the tone of the stomach, and to give rise to dyspeptic disturbances. It is also of much consequence that the food should be introduced into the stomach, as gradually as practicable. In suckling the child receives its nourishment very gradually; and this should be imitated, when artificial food is given by the hand.

This can be most conveniently done by causing the infant to suck the fluid aliment from a bottle, furnished with the usual silver tube, the mouth-piece of which is pierced with a *small* orifice. By this contrivance, the child will receive its food in the same gradual manner, as when nourished at the breast, and it will rarely take more than its appetite calls for, an error which is frequently committed when fed with a spoon. After the *seventh* month, small portions of the preparations of food just mentioned, should be given at *regular periods*, three or four times daily. This will prepare the infant, for the sudden change, which it has to undergo in the character of its food, when it is weaned; and thereby tend to lessen the liability to unpleasant consequences from the change. Infants who have been moderately fed with suitable articles of food, sometime previous to weaning, almost always accommodate themselves much more readily and with much less uneasiness to the change, than such as have seldom or never received any other aliment, than that which they draw from the mother's or nurse's breasts.

If the appointments of nature, and experience shew that human milk is the appropriate aliment during infancy, it is manifest that the mother's breasts constitute the only genuine fountain from which this delicious and congenial nutriment is to be drawn by the infant. Mothers ought never to delegate the suckling of their infants to others. This sacred office should rest with the mother alone. It is an irremissible duty, which can never be neglected or put off, without contravening the wise and benevolent arrangements of Providence. The mother who submits the suckling of her infant to another, while her own breasts are ready to furnish an ample supply of milk, can scarcely possess an amiable and moral heart. It is indeed a most extraordinary circumstance, that a duty which is so strongly enforced by the commands of nature, and which is connected with so many delightful and hallowed sentiments of the maternal heart, should ever be voluntarily relinquished. Did we notice this unnatural and cruel practice only among the low and ignorant, we might ascribe it to that blunted sensibility and obtuse moral feeling which is apt to be engendered by the privations and hardships of poverty. But it is not so. It is only among educated, refined and polished females, that we witness the appointments of nature, and the decencies of maternal conduct thus outraged. It would seem as if the higher refinements of civilization tended rather to stifle, than to cherish the pure and instinctive sentiments of the heart, and to substitute the dictates of fashion for the original and unerring impulses of nature.

As it is manifestly the design of nature, that the infant should draw its food from the mother's breasts, it is reasonable to pre-

sume that this design cannot be contravened, without subjecting both mother and infant, to an increased liability to injurious consequences. It can scarcely be doubted that the mother's milk, is, in general, better adapted to the constitutional temperament of her offspring, than that furnished by others. Besides, when the suckling of the infant is submitted to a nurse, it is liable to various sources of injury and disorder, which are in a great degree, if not entirely obviated, when this important duty is performed by the mother. The nurse may not be able to furnish a sufficient supply of milk to afford adequate nourishment to the infant. This is by no means uncommon. Nurses often practise great deception in this respect. In order to obtain employment, or retain their situation, they will declare that they have an abundance of milk, when, in truth, the very reverse is the case. To supply this deficiency of milk, the wily nurse will resort to clandestine feeding; and as this is generally done in a very improper way, the child usually fares much worse, than if it had been, from the beginning, nursed exclusively by appropriate artificial food. The food which is thus secretly hurried into the stomach of the child, never fails to give rise to griping, flatulency, colic, diarrhœa, and fretfulness. To allay these sufferings, carminatives and anodynes are privately resorted to; and thus, whilst the parents suppose that the infant enjoys the advantage of proper nursing, its health, and even life are often sacrificed to the secret practices of a mercenary and unprincipled nurse.

The child, also, runs much more risk of receiving bad and unwholesome milk, when suckled by a hired nurse, than when this office is performed by the mother herself. I have known several instances of most serious injury inflicted on the child's health and constitution in this way. That syphilis may be, and has been communicated through the milk of the nurse, I have not the smallest doubt; and the communication of other loathsome diseases, by nurses, to their nurslings, such as itch, tetter, &c., is by no means uncommon. But even where no specific disease of this kind, is contracted, the general health and constitution are often permanently injured by the unwholesome or uncongenial character of the milk furnished by the nurse. When the milk of the nurse is of a bad quality, it usually produces very obvious disturbances in the digestive organs of the infant. The stomach and bowels become weak and irritable. The child vomits frequently, or is harassed by painful and watery diarrhœa. It becomes restless, fretful, and peevish; its flesh wastes and becomes flabby; its countenance assumes a distressed, pale, and sickly aspect; its sleep is disturbed by sudden starts; it often cries out suddenly, as if in violent pain; and, in most instances, fatal irritation, and

effusion in the brain, finally ensue, and terminate the infant's sufferings.

Besides the foregoing sources of injury to the health and comfort of the infant, there are many others, scarcely less detrimental in their tendency, incident to wet-nursing, and which can seldom be wholly avoided, when this mode of nursing is adopted. To attend properly to an infant, by day and by night, requires sacrifices of ease and comfort, on the part of the nurse, which are not often fully submitted to by hired nurses. The mother alone can experience those instinctive and anxious promptings, to administer to the wants and comforts of her offspring, which are necessary to secure the faithful performance of this important duty. Children often suffer much from the indolence and carelessness of nurses. They are suffered, frequently, to lie, for hours, in their wet and soiled diapers, and to remain for days without proper ablutions. Much neglect too, is sometimes practised in suckling the infant. Its stomach is now engorged with milk, that the nurse may have time to walk out, or attend to some of her own affairs, and then, all nourishment is withheld for an unreasonable length of time. At night particularly, the nurse is too indolent or too sleepy to keep the child clean and dry, and to apply it regularly to the breast; and in order that it may not disturb her rest, laudanum, paregoric, or some other anodyne, is clandestinely given to the little victim. The same culpable practice of stupifying the infant with laudanum, is often resorted to during the day, in order that the nurse may attend to some affair of pleasure, or business on her own account. These are not imaginary charges. I have repeatedly known them practised, where such mismanagement was not suspected; and too much vigilance cannot be exercised in observing and scrutinizing the conduct of nurses. It is to be observed moreover that the child is liable to very serious injury from irregular habits on the part of the mother. Intemperate nurses are particularly to be reprobated. I have, in several instances, known infants to be very seriously injured by nurses of this description. Women who hire themselves out for wet-nurses, appear to be more liable to this vice, than almost any other class of females. Under an idea, that while suckling, they require some stimulus to support their strength, and to promote the secretion of milk, they are apt to drink freely of malt liquors, which often leads them, in the end, to resort to the more ardent alcoholic liquors. Thus, the habit of intemperance is sometimes formed; and although they may not drink to the extent of producing intoxication, yet the milk will become unwholesome and injurious to the infant nourished by it.

From the foregoing remarks, founded on experience and observation, the impropriety of excluding the child from the mother's

breasts, and submitting it to the nursing of a stranger, is very manifest. To be obliged to procure a wet-nurse is always an evil, and cannot but be viewed as such, by every sensible, humane, and good mother.

Unfortunately, however, mothers are not always in a condition which enables them to suckle their own infants; and the employment of a wet-nurse, or recourse to artificial nursing, is unavoidable. The causes which may prevent the mother from nursing her child are: 1, A decided deficiency, or total failure in the secretion of milk, in consequence of organic disease or functional torpor of the breasts. 2, A bad state of milk, rendering it decidedly prejudicial to the health of the child. 3, The presence of a morbid taint, or some communicable chronic disease in the maternal system. 4, When suckling gives rise to painful or dangerous affections in the mother, as colic, cough, distressing nervous affections, great weakness, epilepsy, &c.

When causes of this kind render it improper or impracticable for the mother to nurse her child, it then becomes a question whether a wet-nurse should be employed, or artificial nursing resorted to. If a healthy, fresh, and faithful nurse can be procured, this mode of nourishing the infant, is certainly preferable to artificial nursing. It is not often, however, that a nurse can be obtained who is, in all respects, well qualified for this office. In general, a nurse who has no child of her own to take care of, is much to be preferred to one who has this additional charge; more especially when the infant intrusted to her care, is removed from the immediate observations of its parents. The foster-child is always more or less neglected when the nurse has an infant of her own to attend to. If there is a deficiency of milk for both, the promptings of maternal feeling, will be very apt to favour her own child; and, if the latter should become sick, and require particular attention, the foster-babe will seldom receive proper nursing. When the wet-nurse is received into the parents' house, the superintendence of the mother, may, in general, prevent such misconduct on the part of the nurse; but when the child is nursed out of the house, and removed from the presiding care of a watchful parent, the probability of its being neglected and maltreated is always very considerable. It would, in general, be much better to nurse the child artificially, under the eye of its mother, than to place it entirely at the mercy of the wet-nurse. Nurses, doubtless, are sometimes found, to whom a child may be safely intrusted; but experience has but too often shewn that the reverse is much more common.

Attention must also be paid to the previous and present health of the nurse. No woman, who has led a debauched course of life, even though reformed, can be regarded as a perfectly safe

nurse, however careful and attentive she might otherwise be. Females of this description are apt to have their systems contaminated with some morbid taint, which may give an unwholesome quality to the milk, and injure the child's constitution. The existence of scabby or scaly eruptions on the skin, unless they are of transient character, and of chronic ulcers, particularly on the legs, should be regarded as sufficient objections to a nurse. A manifest scrofulous habit, also, is decidedly objectionable. The age of the milk is another point of considerable importance. Milk that is six or seven months old, seldom agrees well with infants during the first two or three months after birth. In general the milk becomes much more rich and nutricious after the fourth month, than it is previous to this period; and hence milk of this kind, from its requiring stronger digestive powers than younger milk, often gives rise to much disturbance of the stomach and bowels in new-born infants. As a general rule, therefore, the age of the milk, should not vary much from that of the child, up to about the fourth month. After this period, such a relation between the ages of the milk and child is not of much importance; for a child five or six months old and upwards, may be well and safely nourished by a fresh breast.

The occurrence of the menstrual evacuation, during lactation is almost invariably attended with diminution and deterioration of the milk; and constitutes a well-grounded objection to a wet-nurse. This is more especially the case during the first three or four months of infancy. When a child, at this early period, is put to the breast of a nurse who menstruates, it rarely fails to experience derangements of the stomach and bowels. After the seventh or eighth month of age, there is much less inconvenience and disorder to be apprehended from this source; but even at this advanced period of infancy, the milk of a nurse, thus circumstanced, may give rise to disturbances in the digestive organs, and should, if possible, be avoided. Nature, here, as elsewhere, is a safe guide. We perceive that menstruation is almost universally suspended during the period of suckling; and we may presume that this arrangement of nature is designed for some useful purpose—for the well-being, doubtless, of the infant. Nature, therefore, as well as experience, indicates the propriety of withholding the breast from the child, when from constitutional peculiarity, or some accidental influence, the menses make their appearance in the nurse.

A nurse who has but one good breast should never be selected. A child suckled by one breast only, is apt to contract the habit of squinting, from having its eyes constantly directed to one side; and there is also some risk of its head and shoulders acquiring an oblique or crooked form. Even when both breasts are perfect

and exuberant, some nurses are disposed to suckle principally with one only. This should not be permitted. The child should be nourished alternately from both breasts. Some attention should also be paid to the nurse's nipples. If they are very small, the child will be apt to fatigue itself in sucking, without being able fully to satisfy its wants. This defect can seldom be properly remedied. The practice of drawing out the nipples by suction, with a tobacco pipe, will be of advantage; but when the nipples are very small, and deeply imbedded in the breast, it can scarcely remedy the evil. In some instances the nipples yield the milk so freely, that the child is continually harassed by a sense of strangulation, while suckling, from inability to swallow as rapidly as the milk issues into its mouth. This may, in general, be remedied by passing a piece of fine tape pretty firmly round the base of the nipple; or the nurse may compress the nipple moderately between the first and second fingers, while the child is suckling.

Finally, particular regard should be had to the temper and moral babits of the nurse. An irritable, passionate, and sour-tempered female is but illy suited for this important duty. Not only is the child liable to be maltreated by a nurse of this character, during the fits of ill-nature and passion; but the most serious and alarming effects may be produced on its tender organization, by the milk of such a nurse. It is well known that violent anger, and habitual sourness of temper are peculiarly apt to give a pernicious quality to the milk. Children have been thrown into convulsions, by suckling soon after the nurse has been agitated by violent anger or rage; and alarming vomiting and purging is particularly apt to occur from this cause. Indeed every kind of inordinate excitement, or depression of the mind is unfavourable to the secretion of healthy milk. Protracted grief, sorrow, or mental distress and anxiety in the nurse, seldom fail to exert a prejudicial influence on the health of the nursling. This circumstance ought not to be overlooked, in choosing a wet-nurse. Women, whose domestic relations expose them to moral affections of this kind, cannot be regarded as well adapted for this office. Tranquility of mind, and evenness of temper are particularly desirable in a nurse; and no female ought to be admitted to this duty, who is, either by temperament, or extraneous circumstances, placed in an opposite condition.

Artificial Nursing.—Under judicious management, infants will, in general, experience no particular inconvenience from a course of artificial nursing; and, as a general rule, this mode of nourishing children, when properly conducted, is upon the whole preferable perhaps, to the employment of a wet-nurse whose competency and fitness is equivocal. This preference, however, is founded

rather on the greater risk which the child incurs of being mal treated and neglected, when submitted to the exclusive care of a wet-nurse, than when nursed artificially, under the immediate superintendence of a parent; for there can be no doubt, that fresh human milk, when uncontaminated, is always the best possible nourishment for infants.

There are indeed circumstances, in relation to the condition of the child, which render the employment of a wet-nurse, notwithstanding all the risks that have been mentioned, decidedly preferable to artificial nursing. Very young, and peculiarly delicate and feeble infants, seldom do well when raised by the hand. Fresh and wholesome milk from the breasts of the mother, or a healthy nurse, is almost indispensable to the well-being of an infant thus circumstanced. The same observations apply to infants, whose stomach and bowels are peculiarly weak and irritable, and consequently particularly liable to disorder, from even slight sources of gastro-intestinal irritation. Finally, if upon trial, the slightest and most appropriate kinds of artificial aliment are found to disorder the alimentary canal, the life of the infant will very probably depend, on its being nursed by a fresh and wholesome breast.

In many instances, however, it is wholly impracticable to procure a suitable wet-nurse, and artificial nursing becomes unavoidable. Sometimes the mother, though incapable of supplying a sufficient quantity of nourishment by the breast, is still able to furnish small portions of wholesome milk, and when this is the case she ought by all means, to continue suckling the child, in conjunction with the use of artificial nourishment. The kind of aliment which should be employed, and the mode of feeding proper, in cases where there is a deficient secretion of milk in the maternal breasts, have been pointed out. A mixture of two parts of fresh cow's-milk, and one part of warm water, with a very small portion of sugar will, in general, answer the purpose better than any other article of food, that can be contrived. Thin barley-water, or a very liquid preparation of arrow-root, will sometimes be useful as a change of nourishment, where, from accidental weakness, or a prevailing acidity in the stomach, the milk curdles, and causes griping. As has already been mentioned, the sucking-bottle is decidedly the best mode of feeding the child. Particular care should be taken to keep the bottle perfectly clean and sweet. It should be well washed, both inside and outside, with hot water, every morning and evening. The same food should not be suffered to remain in the bottle more than three or four hours. When kept too long it is apt to turn sour, and to become injurious to the child's stomach and bowels. After the child has satisfied its appetite, no new supply of food

should be added to what may have been left. The quantity of nourishment put into the bottle, should not be much greater than what may be deemed fully sufficient for one nursing; and if any remains, it should be emptied and the bottle well rinsed with fresh water. By these precautions the food will always be sweet, and free from offensive or irritating qualities. Dr. Dewees advises that "the extremity from which the child is to suck should be covered with a heifer's teat, in preference to any thing else." Teats of this kind, properly prepared, are not, however, always to be procured; nor do they appear to me preferable to a few folds of fine and soft linen drawn over the mouth-piece, with a minute orifice, corresponding with the opening of the tube. The teat is often too bulky for the child's mouth, and it is very apt to become hard and unyielding, unless removed and immersed in water after each nursing; in which case it is, on the other hand, liable to become too flaccid and relaxed. Two or three folds of soft linen are readily applied, and may be taken off and washed, or substituted by a fresh and clean piece, without any inconvenience. A common eight-ounce vial, or a half-pint decanter, furnished with a silver tube having a flat and oblong mouth-piece, will, in general, answer this purpose very well. When the child uses the bottle, it should be taken up and supported in an easy semi-recumbent position, on the lap or arms of the nurse. The practice of *dandling* and *jolting* infants soon after they have taken nourishment, is decidedly improper. The child should be kept quiet for at least thirty or forty minutes after having received its nourishment. Rest is particularly favorable to digestion: more especially during its primary stage. It would seem as if the digestive organs required a concentration of the vital energies upon themselves, to enable them to perform this important function with due rapidity and ease. Nature constantly verifies the truth of this observation. All animals manifest an inclination for repose and quietude after a full repast; and experience has shown that, the process of digestion is particularly liable to be impeded by strong mental or corporeal exercise or agitation immediately after a full meal.

Children, who are entirely nursed by artificial diet, should be restricted to the use of the milk-and-water mixture mentioned above, until several teeth have made their appearance. They will, in general, enjoy more perfect health and thrive better, when nourished exclusively with this simple aliment, than under the use of any other nourishment that can be made. After the third month, however, the proportion of milk should be somewhat increased: namely, three parts of milk to one part of water. After the first teeth are protruded, the food may be a little more varied and substantial. Grated crackers dissolved in warm water; oat-

meal gruel; liquid preparations of arrowroot, tapioca, or sago; milk thickened with rice flour, and thin pap, may be allowed in moderate quantities along with the ordinary milk-and-water mixture. When these preparations do not agree with the child's stomach, they should be mixed with an equal portion of weak mutton, chicken, or beef broth, clear and well freed from fat. A mixture of this kind is, in general, easily digested, and rarely causes any unpleasant effects on the alimentary canal, when used after the first teeth have made their appearance. With some children, no form in which cow's milk can be given will agree with the stomach. In such cases, farinaceous decoctions, mixed with a small portion of cream, are generally digested with perfect ease. Thin oat-meal gruel, or rice flour boiled in water, with the addition of a teaspoonful of cream to each gill of the liquid preparation, will answer very well.

After the first grinding teeth are protruded, weak broths, slightly thickened with oat meal, rice flour, arrowroot, or grated crackers, mixed with milk, constitute, in general, the most appropriate articles of nourishment. A small portion of stale bread may also be allowed, two or three times daily, at this stage of infancy; but all solid animal food should be withheld until the canine teeth have made their appearance. After these teeth are protruded, small portions of animal food, in a solid state, may be allowed with perfect propriety. "The animal food given to young children should be plainly roasted or boiled. Fried and broiled meats, and all food heated a second time, by hashing or mincing, being less digestible, should be avoided. Many people, from a mistaken expectation of strengthening weakly children, give them more animal food, and sometimes twice or thrice a day: but it will be found much more frequently to add to the debility than to the increase of strength. Those children, on the whole, who eat the least animal food, are the most healthy. Nothing is more absurd than the notion that, in early life, children require a variety of food. One food only is provided by nature for them, and it is too presumptuous to assume that the Creator of the world acted in error, and that the ingenuity of man is able to correct it or make any improvement in his works."

The peculiarly excitable state of the system during dentition and the consequent tendency to febrile irritation, render the *free* use of animal food decidedly objectionable during this stage of childhood. Small portions of the more digestible meats may be allowed to healthy children, once daily, with little or no risk of injury; but they should never be permitted to form the principal part of the food. The lean parts of mutton, lamb, tender beef, game, and fowl, should be selected. Veal, pork, pig, goose, duck, and all kinds of salted meats, being of much more difficult diges-

tion, can seldom be used without impeding digestion, and finally injuring the tone of the stomach. Veal is decidedly the most objectionable of all the meats in common use. Fresh fish, boiled, and taken in moderate portions, seldom disagrees with the stomachs of children, and may be used, occasionally, with perfect propriety. Soft boiled eggs, too, form an appropriate article of nourishment for children after the first teeth have come out. When fried, or boiled hard, they are altogether unsuitable. Strongly seasoned meats, compound dishes, ragouts, hashes, meat pies, and pastry are to be wholly rejected. Simplicity and plainness are all-important requisites in the diet of children. Their meals should be made on a few plain and simple articles of food. Children who are indulged in the use of a variety of food, and in compound dishes, very rarely escape debility and irritation of the digestive organs. They soon become pale, dyspeptic, irritable, and languid.

The introduction of fresh food into the stomach before that which was previously taken is entirely digested, seldom fails to operate injuriously on the alimentary canal. To obviate this cause of mischief, an effort should be made, as soon as the child is weaned, to establish some regularity in the periods of taking nourishment; and sufficient time should be allowed for each meal to be completely digested before fresh food is taken. If the meals are not sufficiently remote from each other, the digestive organs will almost inevitably become weakened, from the constant state of action in which they are kept by the continual supply of food. As a general rule, from three to four hours may be regarded as a suitable interval between the meals. If the child requires nourishment between the regular meals, small portions of liquid aliment should be used. When solid animal food forms a part of the diet of children, it should be taken at noon, or in the forenoon. It should not be taken more than once daily, as a general regulation.

Pure water, with or without small portions of milk, constitutes the best drink for children, as it does for adults. The practice of allowing them a little wine, spirits, or malt liquors, is decidedly reprehensible. Children require no stimulus of this kind to excite and sustain their vital functions. The use of such drinks is especially improper during the irritable period of dentition. There exists, naturally, a strong tendency to a preternatural determination of blood to the head, in early childhood,—particularly while the process of dentition is going on. Some of the most fatal diseases of infancy are intimately connected with this condition of the circulation; and it is obvious, that the use of alcoholic stimulants must have a direct tendency to increase this irregular flow

of blood to the head, and consequently to increase the liability to inflammatory diseases of the brain.

Sweetmeats.—Indulgence in the use of sweetmeats is a copious source of disease and mortality during childhood. Dried fruits preserved with sugar, nuts, baked sugar, &c. are among the most indigestible substances employed as food. There are few individuals, even in adult age, whose digestive organs are sufficiently vigorous to digest such articles with facility; and their frequent or abundant use rarely fails to impair the tone of the stomach, and to cause intestinal disturbances. Fruits preserved with their skins, as *raisins*, are particularly pernicious. The cuticle, or skin, of all fruits is of peculiarly difficult digestion. The most active digestive powers are, in general, insufficient to digest this portion of fruits. Added to this the hard and insoluble seeds which raisins and many other fruits in common use contain, render them highly irritating and injurious to the alimentary canal. In vain are judicious dietetic regulations adopted for the nourishment of children, if articles of this kind are allowed. I have known two or three raisins to produce the most serious and protracted disorder of the intestinal canal in infants. Three instances have occurred to me, in which convulsions and speedy death were, unequivocally, the consequence of overcharging the stomach with this indigestible and irritating fruit; and my friend, Dr. Cobb, has recently communicated to me a case, which occurred in his own family, of the most alarming character, produced by the same cause. The infant appeared to be well when put to bed. On attending to it about midnight, it was found cold, pulseless, with a deathlike expression of the countenance, and apparently dying. In a short time spontaneous vomiting came on, by which a large quantity of raisins was thrown from the stomach, after which all the alarming symptoms speedily disappeared. The raisins had been given to the child by a servant of the family without the knowledge of its parents.

The conduct of parents, in relation to this subject, is often extremely irrational and pernicious in its consequences. They would not themselves venture on the frequent and free use of confectionaries of this kind; and yet will indulge their children without scarcely any restraint, in the use of these pernicious luxuries. The sicklier and weaker the child is, the more apt, in general, is it to be allowed these destructive gratifications. The pale, feeble, and sickly child, whose stomach is hardly able to digest the most simple and appropriate aliment, is sought to be appeased and delighted by the luscious and scarcely digestible articles of the confectioner. Indigestion, intestinal irritation, terminating often in ulceration and incurable diarrhœa, are the frequent consequences of such conduct; and at best, such indulgences must,

inevitably, prolong the feeble and sickly condition of the child, and not unfrequently eventuate in permanent constitutional infirmity.

With regard to the use of fresh fruits, writers, on this subject, have expressed different opinions. Apples, peaches, and apricots, when perfectly ripe and mellow, may be occasionally allowed to children, in moderate portions, with entire safety, unless the stomach and bowels be very weak and irritable. In children of a costive habit, the temperate use of these fruits may even have a beneficial effect, by their tendency to excite the action of the bowels. Nothing, however, of this kind is more prejudicial to health than unripe fruits. Unripe apples, so frequently seen in the hands of children, are particularly injurious; both on account of the difficulty with which they are digested, and the peculiar and pernicious quality of the crude juice, or acid, which they contain. Pears, even of the tenderest kinds, appear to be much more indigestible than ripe apples or peaches, and seldom fail, when freely taken, to cause some uneasiness and disturbance in the alimentary canal. Stewed or roasted fruits, particularly the two latter kinds, are, in general, well adapted to the digestive powers of young children, and may be allowed, occasionally, with perfect propriety, provided they are not very sour. When the acid prevails to such a degree as to require the addition of sugar to render them sufficiently palatable, stewed or roasted fruits of this kind rarely agree well with weak and delicate stomachs, and cannot be allowed to young children without considerable risk of unpleasant consequences.

In general, all fruits having a firm cuticle or skin, such as grapes, whortleberries, &c. are improper articles of food for children. The latter berries, especially, are invested with so firm a cuticle, that even the most energetic digestive powers are insufficient to dissolve it; and it is, doubtless, in part, on this account, that of all fruits of the kind they are the most apt to excite internal irritation and diarrhœa. The pulp of grapes, freed from the seeds, rarely causes disorder in the alimentary canal, when taken in moderation; and children may be safely indulged in the use of small portions of it. When swallowed with the skin and seeds, however, grapes are decidedly hurtful; and, as children rarely attend properly to the rejection of these parts, this fruit cannot be put into their hands, without considerable risk of injury from this source. Fruit, that contains small, hard and insoluble seeds—such as strawberries, blackberries, currants, &c. are particularly apt, when freely taken, to disorder the alimentary canal. The seeds, resisting the digestive powers, irritate the mucous membrane of the bowels; and when, from previous causes, this membrane has become enfeebled and irritable, they may

readily excite dangerous irritation. Small insoluble bodies of this kind, frequently remain lodged in the folds of the bowels for many days and even weeks, and give rise to severe and unmanageable disorders of the alimentary canal. I have known a child to evacuate from its bowels a great many small seeds, three weeks after the fruit which contained them had been eaten; and during all this time it had suffered painful and exhausting diarrhœa. *Cherries* are among the most pernicious fruits in common use, and ought to be wholly excluded from the list of articles with which children may be occasionally indulged. Even when eat without the stones, they are peculiarly apt to derange the bowels; and when swallowed with the stones, which, with children, is not unfrequently the case, they are capable of producing violent and even fatal impressions on the alimentary tube. No small number of instances have come under my notice, where the most alarming and, in a few cases, fatal consequences resulted from the irritation of cherry stones lodged in the bowels. Convulsions, inflammation, unconquerable constipation, and exhausting and harrassing diarrhœa, are among the affections which are apt to arise from this cause. All fresh fruits have a tendency to excite, more or less strongly, the peristaltic action of the bowels. As a general rule, therefore, every kind of fresh fruit is improper for children whose digestive organs are weak and irritable, or who are habitually liable to disorder of the bowels. If the digestive powers are vigorous, and there exists no obvious tendency to bowel complaints, small portions of the fruits in common use, the seeds and skins being rejected, may be allowed occasionally, with little or no risk of mischief. It is of much importance, however, that the quantity of such articles taken into the stomach at a time be moderate; and that they should never, with children, be suffered to form the whole, or even principal part, of meals.

CHAPTER IV.

OF EXERCISE.

The importance of permitting the infant to have the unrestrained use of its limbs, has already been dwelled on, when speaking of Dress. At first, its spontaneous motions are, indeed, but very limited; for the muscular power, and the command of volition over it, are acquired in a very gradual manner. Uncertain and awkward motions of the arms—stamping with the legs, and drawing them up, are the first feeble attempts which the infant makes in the use of its muscles. But even these muscular exertions appear to be indispensable to the preservation of its health and the proper developement of its powers; and it should be an especial object of care to allow entire freedom of motion, several hours daily, by avoiding all modes of dress and position tending to restrain the free use of the extremities. With this view, the infant should be taken from its bed and laid on its back upon a soft mattress, or any other level and slightly resisting surface, and divested of every thing calculated to restrain the motion of its limbs and body. When thus indulged with freedom of action, it will soon exercise its feeble limbs, by moving them in various directions; and manifest, "by its repeated and apparently earnest, efforts, how much it enjoys this exemption from restraint." This should be repeated two or three times daily; and in warm weather the air should be freely admitted. Voluntary exertions of this kind are much more efficient in developing the powers of the muscular system, and bringing it early under the commands of volition, than any of the *passive* modes of exercise in common use. Children, who are frequently permitted to exercise their muscles in this way, will, *cæteris paribus*, learn to use their limbs and walk earlier and more steadily than those who are seldom allowed this freedom of voluntary action.

Carrying.—Besides the exercise which infants thus obtain by their own muscular efforts, *passive* exercise should be regularly afforded them, by carrying in the arms and riding in an easy carriage. This kind of motion, when conducted in a proper way, has a highly salutary influence on the developement and vigor of the infantile organization. The use of it should be commenced

as early as the second or third day after birth, provided the infant be not unusually feeble; and it should be daily attended to, as one of the regular and indispensable duties of nursing. The manner, however, in which very young children are usually carried or exercised, is extremely reprehensible, as it is calculated to give rise to very unfortunate consequences in relation to the health and regular conformation of the child's body. I allude, particularly, to the common practice of carrying infants with their bodies in an erect position, before the spine and muscles have acquired a sufficient degree of firmness and activity, to support the trunk and head in this posture. The child is usually carried by the nurse pressing its thighs and hips, with the left forearm, against her body, whilst its trunk is balanced in an upright posture, by resting lightly against her bosom. Thus the whole weight of the infant's trunk rests upon the feeble and yielding spine, while the unsupported head is, in general, suffered to lean constantly to one side, or to roll about in every direction. It requires but little reflection to perceive, that this mode of carrying infants must interfere, very materially, with the regular and symmetrical developement of the body. The feeble spine, yielding to the superincumbent weight of the head and body, is always curved outwards while the infant is held or carried in the erect position; and, when this is daily repeated, for several hours, as is frequently the case, the back is liable to become permanently bent or distorted. A habit, too, of leaning the head to one side is sometimes contracted by the child; and, from the violent manner in which the head is liable to fall from side to side, serious and even fatal injury may be inflicted on the spinal marrow of the neck—a remarkable instance of which is related in Hufeland's Journal. But even after the spine and its muscles have acquired a sufficient degree of firmness, to enable the child to support its head and body in the erect position, without difficulty, it incurs considerable risk of injury from the usual practice of carrying it, almost exclusively on one arm. Nursery-maids are very apt to fall into this error, unless particularly directed to change the arm on which the child is carried. When this precaution is not used, and the child is carried almost wholly on one side, it is apt to acquire the habit of leaning to one side, which it is always very difficult to correct. The child, also, when carried in this manner, usually throws one of its arms around the neck of the nurse, in order to support itself more steadily in the erect position; and of course always with the same arm, when the side on which it is carried is not changed by the nurse. In consequence of this position, the shoulder-blade and side of the chest are liable to be forced upwards and outwards, which may ultimately result in permanent distortion of these parts. The *manner* of carrying infants is, in-

deed, of far greater moment than seems to be generally supposed. Many a parent has had occasion to lament the unfortunate consequences which may result from the errors just mentioned; and yet, it must be confessed, that mothers seldom pay that attention to this subject which reflection and maternal solicitude would seem to suggest.

The spine and its muscles seldom acquire sufficient strength and firmness, before the end of the third month, to enable the child to support its body in an upright position, without inconvenience or risk of injury. Until this power is manifestly acquired, the infant should not be carried, or suffered to sit, with its body erect, without supporting it in such a manner, as to lighten the pressure made on the spine, and aid it in maintaining the upright posture of its head and trunk. But even when thus supported by the nurse, it should not be kept in an erect position more than one or two minutes at a time, and not until it is four or five weeks old. At first (a few days after birth) the infant should be taken from its cradle or bed, two or three times daily, and laid, on its back, upon a pillow, and carried gently about the chamber. Struve observes that, the best mode of carrying very young infants is, to lay them into a small oblong basket. By this contrivance a gentle and agreeable swinging or undulating motion will be communicated to them; and the sides of the basket being three or four inches higher than the child's body, a cover may be thrown over it, without restraining the free motion of its limbs. After the third or fourth week, the child may be carried in a reclining posture on the arm of a careful nurse, in such a way as to afford entire support to the body and head. This may be done by reclining the infant upon the forearm, the hand embracing the upper and posterior part of the thighs, whilst its body and head are supported by resting against the breast and arm of the nurse. When held in this way, it may be gently moved from side to side, or up and down, while it is carefully carried through a well ventillated room. When it is found that the child has acquired a sufficient degree of muscular power to maintain itself in a sitting posture—which rarely occurs before the completion of the third month—it may be carried about, in this position, for a short time, twice or thrice daily, provided the spine and head be supported by the nurse: an aid which can seldom be prudently dispensed with before the child is six or seven months old. "During the first six months," says Struve, "the head of the infant should, in carrying, be supported by the nurse's hand; for the muscles of the neck are, at this tender age, too delicate to preserve the head in an erect posture." Mothers are fond of exhibiting the exploits of their babes, in raising and supporting their heads—"unconscious of the mischief which may be occasioned

by this premature experiment." It is painful to see the violent and generally abortive efforts, which the infant makes to steady its head, when raised into a sitting posture. It will sometimes succeed in balancing its head for a moment, to the great delight of the fond mother; but the effort is almost invariably speedily followed by a sudden and often violent rolling of the head from side to side, which cannot but have an injurious tendency.

All rapid, whirling, and concussive motions are calculated to injure the health and delicate organization of infants; and mothers should be particularly vigilant in preventing nursery-maids from subjecting their charge to such violence. Running or jumping with an infant in the arms—descending rapidly a flight of stairs—whirling round, &c. ought to be rigidly forbidden, as they are attended with much risk of some serious accident, and may interfere with the regular distribution of the circulation, and the healthy action of the brain and other important organs. The practice of supporting very young infants in a sitting posture on the knee, and jolting them violently, cannot be too severely censured. It is not uncommon to see mothers and nurses jolt infants in this manner, with a violence that threatens dislocation, and manifestly occasions them much pain and distress. Tossing them rudely on the arms, though less concussive than jolting on the knee, is equally reprehensible, as it is attended with more risk of injury from falls, blows, &c. These violent agitations, "powerfully affect the delicate organization of infants, and may be productive of spasms, epilepsy, and appoplectic fits." Gentle and cautious tossing on the arms, affords an agreeable exercise of the body, and may be salutary by the moderate agitation which it causes in the internal organs.

Different opinions have been expressed with regard to the propriety of rocking infants in cradles. To gentle and cautious rocking, there can be no just objection. The swinging, or rolling motion of the cradle, communicates an agreeable sensation to the system, and disposes to calmness and repose: and when moderately practised, and not very often and long continued, it can scarcely give rise to any evil consequences. It is otherwise, however, with violent, rude, and almost constant rocking. Rapid and long-continued rocking motion, instead of merely calming the excitement of the brain and inducing a state of agreeable repose, as is the case when gently and slowly performed, is apt to disorder the actions of this organ, in a very decided manner, and, through it, to exert an injurious influence on the whole organization. With infants predisposed to diseases of the head, strong rocking should be particularly avoided.

Riding in a Carriage.—This is an excellent mode of affording suitable exercise to infants, and may, with great propriety, be

employed as an occasional substitute for carrying in the arms. When cautiously managed, it affords a gentle, uniform, and very agreeable motion, for which children, in general, soon contract a great fondness.

The body of the carriage should be long enough to permit the infant to lie down at full length; and the sides ought to be sufficiently high to prevent it falling or rolling out. The wheels should be low, in order to lessen the liability of oversetting; and they must be carefully secured "against running off when the carriage is in motion." Like carrying in the arms, this mode of exercising infants is liable to be conducted in a very improper and hazardous manner. This duty is usually entrusted to children or young girls, who being generally more disposed to consult their own sportive inclinations than the comfort and safety of their charge, are apt to draw the carriage along with great rapidity, paying little or no attention to the roughness or unevenness of the ground over which they pass. Such careless conduct ought to be particularly forbidden by parents; and especial instructions given, that the carriage be drawn along with a moderate and steady pace, and over level grounds. Very young infants should be laid down in the carriage, on a pillow or a small and soft mattress, with the head slightly elevated, "and so confined at the sides as to prevent them from rolling when in motion." After the child has acquired some degree of strength, it should be placed in a semi-recumbent posture, with its head and back well supported by pillows, &c.; and when it is capable of supporting its head, it may be permitted to sit upright in the carriage, being properly secured against being thrown from side to side by the rolling of the carriage.

Walking.—After the infant has acquired sufficient strength to support itself in the sitting posture, it should be placed on a soft carpet, several times daily, and surrounded with its toys. When thus left to the free use of its limbs, it will soon learn to *crawl*—an exercise which should always be freely allowed, and even encouraged, as the most natural preliminary muscular effort to the more difficult one of walking. The common practice of teaching children to walk, by supporting them, prematurely, on their legs, and leading them forward, without allowing them the advantage of having their muscles previously strengthened and in some degree brought under the commands of the will, by the initial locomotive exercise of *crawling*, is objectionable on various accounts. It seldom fails to produce more or less unnatural curvature of the legs; and in infants of a scrofulous or ricketty habit, it may readily give rise to distortion of the spine and round shoulder. Children, who are permitted to exercise their muscles by *crawling*, generally acquire a much firmer step, and enjoy more robust

health, than "those who have been taught to walk without this useful intermediate muscular discipline."

"Before infants attempt to walk," says Dr. Struve, "they should first learn to crawl. With this intention, they should be placed on a large carpet, where they will soon busily employ themselves; move and extend their limbs, or roll about to reach their playthings. If the weather is serene, and the ground perfectly dry, they may be carried out, and placed on a grassplat, where they can range about in all directions; and if they happen to fall, they will not receive material injury on the soft ground, but rather learn to be more cautious in future. While in the nursery, they may be taught to rise from the floor by laying hold of chairs; and, if occasionally supported under the arms, they will easily learn to stand erect; but they should never be raised up by one arm only. At an early age they may be held under both arms; and when thus supported, the hands of the attendant be occasionally withdrawn for a moment, they will soon acquire the power of standing alone. Mild and persuasive language ought to be used in these experiments; while the infant may be encouraged by some toys placed at a little distance, which will induce it to stretch out its little arms, and endeavor to advance towards the place containing the desirable objects. By such means it may be allured to visit different parts of the room. The first journey of this description ought to be attempted only from one chair to another; and afterwards, the little traveller may run towards its mother, or nurse, who stoops to receive it with extended arms. As the child improves in its efforts to walk alone, the chairs may be placed at a greater distance from each other; and when it sees its older companions run and jump about, it can scarcely be restrained, so anxious is it to be placed on the floor, that it may crawl or waddle after them. At length, parents are gratified with one of the most delightful scenes: they behold their child for the first time walking without any assistance. If we are earnestly desirous of training up our children in such a manner, that they may acquire a firm step, and well-formed limbs, we shall gain our purpose much more certainly and safely, by pursuing this gradual and cautious mode of teaching them the use of their legs, than by the more common practice of placing them, prematurely, on their feet, without permitting them the previous exercise of crawling."

Leading-strings and go-carts, formerly so much in use, are now, very properly, almost universally abandoned. The former contrivance is calculated to do very serious injury, by the rude manner in which infants are liable to be pulled about by inconsiderate or illnatured nurses; for, when the child makes a false step, or inclines too much forward or to one side, and is in danger of

falling, it is usually raised by a sudden and violent pull at one or both strings. Dislocations and other painful injuries have frequently been occasioned in this way. Leading-strings, moreover, tend to compress and distort the shoulders; and children are apt to acquire an unsteady and awkward gait, when taught to walk in this manner. Go-carts are still more objectionable. They confine and constrain the body in a very uncomfortable manner; and, as in pushing the machine along the floor, the breast is usually firmly pressed against the circular top, injury may be done to the regular developement and conformation of the upper part of the chest. The very common practice of teaching infants to walk, by holding them by one of their hands, deserves the most decided reprehension. When led in this way, the child's arm is continually, and often forcibly, extended upwards: if it happen to lose its balance, or trip, or if its legs are yet too feeble to support itself long, in the erect posture, the whole weight of its body is often suspended by one arm. Frequently, too, it is entirely raised from the ground by one arm, in order to help it over some obstacle, or to hasten its progress over a rough and difficult piece of ground. It is easy to perceive that this practice must, necessarily, and in no inconsiderable degree, tend to draw the shoulder and side of the chest out of their natural position; and, when frequently repeated, to give permanent deformity to these parts. From the sudden and violent extension which the arm usually receives when the child stumbles, the shoulder and elbow joints are liable to be dislocated or sprained, or the clavicle may be torn from its attachment with the scapula. I have met with several instances of dislocation of the shoulder joint, which were occasioned in this manner; and the occurrence of painful sprains —often of several weeks continuance, from violence done in this way, is by no means uncommon. Parents should most earnestly forbid this mode of leading infants, when entrusted to the care of servants out of doors. Nursery-maids seldom exercise sufficient care in this respect. Too indolent to carry the infant in their arms, as they are directed and supposed to do, they are apt, as soon as they are no longer observed, to place the child on the ground, and to hurry, or rather, drag it along, in the most careless and unfeeling manner. Of a similar, but still more reprehensible character, is the practice of raising infants from the ground by both arms and swinging them about in the air. Fractures, dislocations, sprains, and other dangerous and painful injuries, have frequently resulted from this irrational conduct. No prudent parent will knowingly permit such an outrage; but, as the ordinary attendants on children are often thoughtless and rash, they should always be especially cautioned on this point.

After children have acquired the entire use of their legs, *walk-*

ing is decidedly the best exercise they can take. When the weather is fine, they should be taken out daily, and freely indulged in running and walking about, under the superintendence of a careful nurse. These little excursions, if prudently conducted, have a highly salutary influence on the infantile system. Children, who are raised in the country, are in general much more robust, healthy and active, than those who are brought up in cities: and this difference is mainly to be ascribed to the greater freedom which the former usually enjoy, of walking, running, and tumbling about on grassplats—enjoyments often in a great measure denied to the latter. In taking this kind of exercise, children should not be accustomed to rely too much on the assistance of others. If the ground is favorable; that is, if it is soft or covered with grass, and free from stones, timber, &c., they should be permitted to have their way. A few falls will do them no injury; but, on the contrary, make them less timid, and teach them better than any other instruction how to avoid a similar accident in future. Children, who are never suffered to surmount the little difficulties which may occur in their sports, by their own efforts, and continually warned against trifling accidents, seldom fail to become unduly timid, helpless and irresolute in their actions. Parents ought not to intimidate their children, by inspiring them with a constant dread of falling or hurting themselves. The custom of exaggerating the dangers incident to their usual sports—and of plying them continually with admonitory injunctions against accidents, when they are engaged in their amusements, is calculated to favor the occurrence of the very accidents which they are meant to obviate, by the timidity which these perpetual lessons of caution and fear almost inevitably inspire. When the ground is soft, it is much better to let the child take the chance of two or three falls, and give it full scope for the exercise of its limbs, by running and gamboling about until it is satisfied. Nothing can be more invigorating to the whole organization than this kind of unrestrained exercise, in suitable situations, and under the superintendence of a prudent nurse. Struve, whose excellent observations on this subject I have already drawn on so frequently, observes that, when children happen to fall or hurt themselves, they should not be soothed by expressions of extreme pity and sorrow; for plaintive words and expressions of great sorrow tend very effectually to render them effeminate and timid. Children, who are thus accustomed to excessive commisseration, seldom fail to acknowledge this tender sympathy, by straining their little lungs to the utmost by crying, on every slight injury they receive.

After children have passed through the period of primary dentition, they should be encouraged in the pursuit of active amuse-

ment out of doors, as an essential and regular part of physical discipline. Nothing contributes more effectually to enfeeble the body, and to lay the foundation of permanent constitutional infirmity, than confinement within doors and want of active exercise at this tender period of life. The developement of the moral and physical energies of children can in no way be more effectually promoted, than by permitting them to engage freely in the usual sports of childhood, in the fresh and open air. The practice of obliging children to remain within doors, and to con over their lessons, between school hours, is by no means commendable. These intervals should be devoted to innocent amusement and bodily exercise. Trundling the hoop—flying kites—playing at ball, shinny, or simply skipping and running about, with other juvenile sports unattended with danger, have a decided tendency to improve the health and vigor of the system, and should be freely permitted during the hours not necessarily devoted to the school. Girls may amuse themselves with skipping the rope, dancing, walking, shuttlecock, a well constructed and safe swing, riding in a carriage, &c.

CHAPTER V.

AIR,—TEMPERATURE,—EXPOSURE.

That pure air is indispensable to the entire well-being of the human organization, is so well established by the common sense and experience of mankind, that it seems unnecessary to enforce its truth by any especial illustrations. The *importance*, however, of attending particularly to this point, in the management of children, does not, in many instances, appear to be sufficiently estimated. At no period of life are the effects of confinement in stagnant and impure air, more obviously and lastingly detrimental to the animal economy than during the feeble and susceptible age of childhood. How deeply pernicious a foul and confined air is, in its influence on the human system, is most strikingly illustrated in the pale, feeble, and sickly aspect of those unfortunate children who are early placed in manufacturing establishments, where they are confined, nearly the whole day, in crowded and ill-ventilated apartments. Children brought up in the crowded and filthy parts of large cities, seldom exhibit a perfectly healthy and vigorous appearance. Go into the country,

and you will everywhere meet with children rioting in the exuberance of health—plump, ruddy, robust and active. Exercise and simplicity of wholesome diet, doubtless contribute essentially to this healthful condition; but, no regulations of diet—no attentions to exercise, and no sanitary observances whatever, are adequate to produce a similar fortunate result, when counteracted by the continued depressing influence of a confined and contaminated atmosphere.

Infants ought to be early accustomed to the fresh and open air. The practice of confining them, during the first five or six weeks, to the close and heated air of nurseries, has a direct tendency to impair the energies of the system, and to impede its healthful developement. The daily enjoyment of fresh air, for an hour or two, contributes very essentially to the health and sprightliness of infants; and constitutes one of the most efficient preservatives against that delicate and sickly condition, which is so frequently witnessed in those who are almost constantly confined and pampered in nurseries. "Pale countenances, weak eyes, general relaxation of the body, an accumulation of all the inconveniences and sufferings of childhood—at length consumption and early dissolution of life: all these are the natural and frequent consequences of such confinement. On the contrary, there is no method, by which children may be more effectually preserved against such unfortunate events, than by permitting them to inhale a fresh and uncontaminated air. Pure air is, indeed, most grateful to the feelings of children. After having been carried out, but a few times, they evince, even at a very early age, a strong desire to return to the open air. While yet on the arms of the nurse, they anxiously point to the door, and make efforts to approach and open it. When they can scarcely crawl, they instinctively advance towards that part of the room from which they have a prospect of escaping. Hence, in the bosom of nature they experience the greatest comfort; and their tears can frequently be stopped in no other way, than by taking them out of doors into the free air." (*Struve.*)

When the weather is clear and of a mild temperature, infants should be carried into the open air, once or twice daily, as soon as they are two weeks old. During cold and humid weather, they should be occasionally conveyed out of the nursery into an adjoining well-aired room: avoiding, however, strong currents of air, and sitting with them near an open window. Important as the enjoyment of fresh air is to the health and comfort of infants, care should be taken to accustom them *gradually* to the impressions of the external air—more especially when the atmosphere is cold and damp. The practice of exposing children, soon after birth, at once to the open and cold air, with the view of "hard-

ening them," as it is called, is attended with considerable risk of injury, and should not be permitted by parents, except when the weather is clear and very mild. Catarrhal and other inflammatory affections are frequently contracted in this way; and in feeble children, low temperature, when thus suddenly applied, is apt to occasion serious depression of the vital energies, and to predispose very strongly to the occurrence of febrile and other dangerous maladies from the subsequent influence of the ordinary exciting causes of disease. Instead, therefore, of exposing any young infants, at once, to the direct impressions of the external air, when the state of the atmosphere is unfavorable, they ought to be gradually inured to such a transition, by carrying them frequently out of the nursery into the cooler and less confined air of well-aired and unoccupied rooms. In this way, they will soon become, in some degree, habituated to sudden transitions of temperature, and to the more direct impressions of the open air. Even in summer, the infant should not, as a general rule, be carried, at once, into the external air, without having been previously accustomed to the air of a well-ventilated chamber. After the child is three or four days old, it ought to be conveyed, several times daily, out of its nursery, into a room having, at first, only the windows open, and in four or five days afterwards, the doors also, so as to admit of a free circulation of the air through every part of the room. This having been practised for ten or twelve days, the child may then be carried out of doors, and permitted to enjoy the pure and open air. At first, it should not be allowed to remain out of doors more than ten or twelve minutes at a time; but the duration of this indulgence must be gradually extended, so as to keep it in correspondence with the progressive developement of the child's organization and energies. After a child has acquired the power of walking, it should be suffered to spend a great portion of its time in the open air, and in the pursuit of its ordinary amusements, provided the weather is sufficiently temperate and dry. Nothing affords more real enjoyment to children, and at the same time tends more decidedly to give them a sound and active tone of mind and body, than a liberal indulgence in exercise and their innocent sports out of doors. A country residence possesses many important advantages in this respect, which cannot be had in large cities. There, they constantly breathe a delightful and perfectly pure air, and may be safely permitted to run, skip, and tumble about under the shade of trees, and on the soft and green surface of a lawn or grassplat, almost without restraint and risk of receiving any serious hurt or injury. In cities, on the contrary, the atmosphere is always more or less contaminated with impure and noxious exhalations; and children cannot be prudently permitted to enjoy the same freedom

of exercise and active amusement out of doors, as in the country, from the constant risk of receiving some injury when suffered to be on the side-walk, and the confined and narrow space of ground usually allotted to the houses. But, although the atmosphere of cities is always far from being perfectly pure, still, the daily enjoyment of the *open air*, impure as it may be, is decidedly beneficial, and should never be withheld, under an idea, that by free ventilation and cleanliness the air breathed within may be rendered as pure as it is out of doors. In cities of small extent, children "may be taken to a garden or field near the town;" and the larger cities generally afford public squares, or parks, devoted to the exercise and recreation of the citizens, to which children may be, conveniently, taken, where they may enjoy a free and fresh air, and amuse themselves by playing and running about on the grass." (*Struve.*) These little excursions have a very salutary tendency; for, besides the excellent effects of the exercise which they afford, there is something peculiarly enlivening and grateful in the influence of the open air, which children seldom fail to manifest by their expressions and actions. When they have the advantage of a lawn or grassplat, children should be allowed to amuse themselves freely in their own way. "Boys may be permitted to run about, without their hats, though exposed to the wind and sun. If they do not, spontaneously, complain of heat or cold, it may be considered as a proof that they are in good health; for diseased and debilitated children will speedily return to the nursery. If they cry, and cannot bear the blast of a moderate wind, or a slight degree of cold, it is then proper to return with them to the house, as they are probably indisposed; but if, on the contrary, we find them lively and cheerful, they may be allowed to continue in the air as long as they are comfortable and easy. Children should not be forced against their inclination to go out of doors, during a fall of snow or the intense heat of summer. If they are once inured to a rough atmosphere, no compulsion will be necessary." During the first two or three years of infancy, no difference need be observed in relation to this subject between boys and girls. Parents are, in general, averse to allowing girls the same freedom of exercise and amusement in the open air that is usually granted to boys, on account of the tendency which free exposure to the atmosphere and the direct rays of the sun has to render the skin dark and harsh. A white and smooth skin, and a delicate organization are, by many, regarded as marks of a genteel education; and these vain distinctions are often sought and obtained at the expense of health and a firm constitution, by too much seclusion from the external air and light of the sun. Girls, like boys, ought to be freely and frequently exposed to the open air and weather. The complexion may not become so del-

icate and fair, when this freedom of exposure is permitted; but the more pleasing appearance of florid and robust health, accompanied with a delightful feeling of buoyancy and vigor, will be obtained in its stead: a result infinitely more valuable than fairness and smoothness of skin and delicacy of structure,—and which will extend its salutary influence throughout the whole subsequent period of life. "Not a day," says Willich, "should be suffered to pass without affording children—both boys and girls—the benefit of exercise in the open air. In this instance, custom ought to become second nature; they must be inured to external impressions; and the daily enjoyment of this balm of life should constitute an essential part of their regimen."

Although children should be permitted to indulge freely in exercise and active amusement, during their daily excursions in the open air, constant care ought to be had, that they do not lie down or sit on the cool and damp ground, or in a strong current of air in the shade, when they are in a state of perspiration from exercise; nor should they, on any account, be permitted to drink cold water, except in very small portions, and at considerable intervals, when in this heated condition. A neglect of these precautions is apt to give rise to the most serious consequences. Inflammation of the brain, lungs, stomach, bowels, liver—catarrhal affections, terminating ultimately in disorganization of the lungs, croup, and violent inflammatory rheumatism, are often suddenly excited by cold and dampness when applied while the body is thus especially predisposed to their morbific influence. Nurses and servants should always be especially instructed on this point; and as soon as children are old enough to comprehend the lessons of caution, they should be earnestly impressed with the evil consequences of these practices, and of the necessity of avoiding them as an irremissible condition of their being permitted to run about and play out of doors.

It is not enough, however, that children be taken into the open air, for an hour or two daily, in order to secure them the full amount of benefit which may be derived from this source; for unless proper attention be constantly paid to the preservation of a comparatively pure and fresh air, in the rooms in which they sleep and spend the greater part of their time, the temporary enjoyment of the external air cannot effect a great deal towards the permanent invigoration and health of their systems.

Particular care should, therefore, be taken to prevent the air of nurseries from becoming impure and stagnant, by proper attentions to cleanliness and ventilation, and the avoidance of every thing which may tend to give rise to unwholesome effluvia. When the atmosphere is mild, the external air ought to be freely admitted into the room, by keeping a window open during the

day; and at night the chamber door may be left open, or a sash raised, whilst the current of air is intercepted by the closed shutters. In cold and humid weather, the upper sash of a window should be occasionally drawn down a few inches during the day. At night, a window in the adjoining apartment ought to be left open, the fresh air being suffered to enter the nursery, by the door of communication. Chimney boards, as they impede the free circulation of the air in rooms, are decidedly inadmissible in well-regulated nurseries. The same objection exists to "double doors, linings, listings and sand-bags"—all of which, by preventing some degree of ventilation, contribute to an unwholesome condition of the air. Indeed the maintenance of a proper circulation of air in the apartments appropriated to children, cannot be too strongly urged on the attention of parents. Even where the general atmosphere is impure, as is always the case in large cities, free ventilation should never be neglected; for, however contaminated the external air may be, it soon becomes still more impure and insalubrious, by being breathed in a confined or stagnant state. The practice of using the nursery as a common sitting room, by the female portion of the family is extremely improper,—more especially when from the inclemency of the weather, the doors and windows cannot be kept sufficiently open, to secure a proper renewal and circulation of the air. Each individual exhausts the vivifying principle of nearly a gallon of air every minute: and the contaminating and putrescent exhalations which are continually issuing from the human body, constitute a source of rapid atmospheric deterioration.

The observance of strict cleanliness, also, is indispensable to the preservation of a pure air in nurseries. The floor should be kept clean and dry; wet and soiled articles of clothing must not be suffered to remain in the room; and the child's excretions ought always to be speedily removed. "No food should be cooked in nurseries, if it can possibly be avoided; nor should linen be washed, dried or ironed there, as these processes tend to render the air offensive and impure. Hanging up the linen of children or drying their diapers in the place where they respire, produces exhalations highly detrimental to their eyes, as well as injurious to the general health." No flowers ought to be cultivated in nurseries, since they not only tend to deteriorate the atmosphere during the night, but often give out effluvia that are highly injurious to the animal economy. It need scarcely be observed that the burning of charcoal, out of the full draught of a good chimney, is always attended with the utmost risk of alarming or fatal consequences.

There is no part of the management of nurseries more important in its consequences, than a proper regulation of the temper-

ature. The apartments of children are, in general, kept much warmer than is consistent either with comfort or health. Nothing tends more directly to enfeeble and relax the human body, and to predispose it to the injurious influence of cold and atmospheric vicissitudes, than habitual confinement in heated rooms. The cutaneous and pulmonary exhalents, being kept, almost continually, in a state of inordinate excitement by the stimulus of the heat, acquire so great a susceptibility to the depressing influence of low temperature, that the slightest exposure to the open air, is apt to arrest their action, and to give rise to the various distressing and dangerous consequences of a suddenly checked perspiration. "Warm rooms," says Struve, "in my opinion, principally contribute to the extraordinary mortality of children, who are carried off by convulsions, in the first months of their lives. As they daily become weaker from the constant action of heat, every draught of air occasioned by opening the windows or doors is dangerous to their organs. It is an established fact, that in the proportion as we habituate ourselves to warm dress and heated apartments, so do we render the body more liable to be injured by exposing it to the influence of fresh or cold air." Children who are accustomed to immoderately warm rooms are seldom entirely free from coughs and colds during cold and humid weather; for as they cannot be always confined to their apartments they are unavoidably at times exposed to the impressions of cold air. As the continued influence of atmospheric heat has a very decided tendency to increase the irritability of the system—rendering it morbidly susceptible of the impressions of irritating causes, the practice of keeping the air of nurseries very warm is particularly detrimental to children during the period of dentition. Under the most judicious sanitary regulations, the systems of children are apt to acquire a morbidly irritable condition during this process. It is manifest, therefore, that when this natural tendency to an irritable habit, is promoted by the cause under consideration, the liability to disease must be peculiarly great. When we take into view the tendency which exists during dentition to a preternatural determination of blood to the head, in connection with the general irritable and inflammatory condition just referred to, it is obvious that children who spent the greater part of their time in heated rooms, must be especially liable to inflammatory affections of the brain, from the occasional impressions of cold to which they are necessarily more or less exposed.

The temperature of nurseries should never be suffered to exceed 70° of Fahrenheit. In general a temperature of about 65° or 66°, is sufficiently comfortable; and experience has shown, that it is best adapted to secure the health and vigor of the human system. This moderate degree of heat does not favor

the generation of noxious effluvia from decompositions; nor does it impair the natural powers of vital resistance, to the injurious impressions of cold, or sudden transitions of temperature. Children who are accustomed to this temperate degree of warmth, may be taken into the open and cold air, without any peculiar risk of injury, from its sudden depressing influence.

CHAPTER VI.

THE NURSERY.

From what has already been said, in the preceding chapter, in relation to the great importance of preserving a pure and fresh air in the apartments of children, it is obvious that a good nursery ought to be spacious, perfectly dry, airy, and elevated above the ground floor. In general these important requisites to the proper adaptation of nurseries for the purposes of comfort and health are too much neglected. Instead of selecting a large and airy apartment, the narrowest, most indifferent and cooped up room in the house is often appropriated to this purpose. It is very difficult to preserve a proper degree of purity and circulation in the air of a small room, without subjecting its inmates to much inconvenience and risk of taking cold. From the smallness of the space, the air of such a room, soon becomes contaminated by breathing, perspiration and other unavoidable sources of impure effluvia. To preserve a sufficient degree of purity and freshness in the air, recourse must be had to frequent ventilation, by opening a window or door. A constant fluctuation of temperature is thus kept up in the apartment; and those who remain in it, are much exposed to the injurious influence of repeated currents of damp and cold air. These unfavorable circumstances are, in a great degree, obviated by a large and airy room. Ventilation need not be so frequently repeated, and may be performed without injurious vicissitudes of temperature, or direct exposure to strong and sudden draughts of cold air. Independent of the greater facility of keeping up a suitable degree of temperature, purity, and circulation in the air of spacious apartments, nurseries of ample dimensions are particularly desirable also on account of the opportunity which they afford to children of taking exercise, by running and jumping about on the carpet, "when the weather will not permit them to enjoy the advantages of the open air."

A nursery consisting of two chambers opening into each other possesses many very important advantages over a single room. With such an arrangement the children may sleep in one room, and remain in the other while awake. They may thus enjoy the advantage of going to sleep in pure air; and of passing, in the morning, out of their bed-chambers, at once into the renewed and purified air of the other apartment. They may also avoid inconvenience and risk of injury, from the dust, currents of air, &c. which attend the sweeping, dusting, washing and ventilation of the nursery; for while these operations are going on in one room, they may retire into the other.

With regard to the best means for warming nurseries, there exists some difference of opinion. Dr. Dewees objects to the use of stoves, because: "1st, there is greater danger that the children may get severely burnt; 2d, they are almost always too much heated; 3d, they render the air too dry; 4th, the air is almost constantly injured by substances thrown upon the stove, as grease, meat, &c.; 5th, there is always a temptation to do some kind of cooking upon or in the stove, to the annoyance of the comfort, or the injury of the health of the inmates, besides the serious risk of scalding by heating water upon it." Carelessness and improper conduct may, indeed, convert any contrivance for warming apartments into a nuisance. Most of these objections apply with equal, if not greater propriety to open fires. The risk of injury from burns, is certainly quite as great from an open fire, as from a stove. How often do we hear of children receiving the most serious, and even fatal burns, from their clothes taking fire by coming in contact with open fires? The use of a good fender, will, doubtless, obviate the liability to this accident; but the risk of receiving burns from a stove may be quite as effectually prevented by surrounding it with a proper railing—and this should always be done in apartments appropriated to children. The tendency of stoves to produce too great a dryness in the air may be readily counteracted by keeping a small basin of water slowly evaporating on or near the stove. The objection that stoves are apt to be kept too warm, is founded rather on the abuse than on any positive unfitness of this mode of heating rooms, and may be effectually obviated by proper care and management. The same observation applies to the other objections—namely that stoves are apt to be used for cooking; and that grease, meat and other substances calculated to give rise to offensive effluvia are often thrown upon them, and the air thereby rendered impure. Open fires, are, in truth, much more frequently used for cooking in nurseries, than stoves; and, although much of the steam and effluvia may be carried up by the draught of the chimney, enough of them is in general diffused throughout the room, to give an

unpleasant and unwholesome character to the air. Whether stoves or open fires be used, cooking ought never to be permitted in well-conducted nurseries. If rooms warmed by stoves are more liable to be heated to excess, open fires, on the other hand, are more apt to keep up an injurious variation of temperature. The preservation of a steadfast and uniform degree of warmth, throughout every part of the room is particularly desirable in nurseries. This is easily effected by means of a stove, however spacious the chamber may be. With an open fire, on the contrary, it is always extremely difficult to procure a uniform temperature in large apartments; for while the air near the fire is uncomfortably warm, that of the remoter parts of the room is often disagreeably cold. Nevertheless, in small and confined nurseries, an open fire is upon the whole, preferable to a stove; for as the air of a small chamber is soon rendered impure by the breathing, perspiration, &c. of its inmates, a more regular influx and circulation of air is required, than in large rooms, to keep up a proper degree of atmospheric purity—and this is much more certainly obtained by the draught of an open chimney than by an ordinary close stove.

The windows of nurseries should be provided with bars fixed across the lower half of them, in order to prevent children from falling out—an accident which is by no means uncommon, when this precautionary measure is neglected. They should also be supplied with shutters, particularly when they face the south, "that the room may be darkened, when the exclusion of light becomes necessary or proper."

The floor of nurseries should be covered with a soft woollen carpet. This is especially proper, during early infancy; before children have acquired the full use of their legs, and while they are as yet subject to frequent falls and blows, in their feeble and uncertain efforts to move about the room. Children rarely receive any material injury from falling on a soft carpet: and when we advert to the very serious consequences which are apt to result from severe blows on the head during childhood, the want of carpeting must be regarded as a very considerable defect in a nursery. All superfluous furniture, should be excluded from the apartments appropriated to children. They should, however, be supplied with well-adapted contrivances for infantile amusement and exercise. A well-constructed rocking horse, usually affords children much delight combined with excellent exercise.

CHAPTER VII.

OF WEANING.

The period to which suckling may be extended without affecting the health either of the mother or infant is so entirely under the control of a variety of circumstances of an accidental character, that no particular term, of general applicability, can be assigned at which infants should be finally separated from the breast. In general, this important function is continued much longer, than a proper attention to these circumstances would justify; and the consequences of this error, are often of a very serious character. The only thing that is usually regarded by mothers, in fixing on the time for weaning, is the *age* of the infant. The child is suckled until it attains a certain age, without any regard to the developement of its digestive powers, or the state of its health and constitutional vigor. By this course, children may be kept at the breast, long after the vigor of the digestive functions, and the demands of the system require a more substantial and nutritive diet; and on the other hand, they may be separated from the breast, before the stomach has acquired sufficient energy to digest with due facility a stronger and less congenial aliment. The progressive developement of the digestive powers, and the demands of the organization in relation to nutrition, are very various among different infants. It is particularly important that the condition of infants, with regard to these circumstances, should be consulted in regulating the period of lactation. The obvious correspondence which exists between the successive appearance of the teeth, and the developement of the digestive powers, affords us a safe guide in relation to this subject. The child comes into the world with teethless gums, and instinctive powers, adapted in the most perfect manner, for drawing its nourishment from the maternal breast. It is not furnished with teeth, because neither the mode in which its appropriate nourishment must be taken, nor the character of the nourishment itself requires such organs, nor are the powers of the stomach as yet sufficiently active, to digest, in a proper manner and without injury, the kind of food which would require the aid of teeth. After the lapse of some time, varying in different cases from about two to four or five months, the first two inferior cutting teeth protrude through

the gums. In the course of from four to six weeks afterwards, the two corresponding teeth of the upper jaw make their appearance. These, in three or four weeks, are succeeded by the *lateral* cutting teeth of the lower jaw; and in a few weeks subsequently, those of the upper jaw also make their appearance.

Now, as in relation to their use, the teeth have a direct reference to a more substantial aliment, than that which the stomach of the new-born infant is capable of digesting, we may reasonably infer, that the successive appearance of these accessary instruments of digestion, corresponds with the progressive developement of the important function which they are intended to subserve. Thus an infant that is furnished with four or more teeth, at the age of six months, may be presumed to possess more active digestive powers, and to require a more varied and nourishing food, than one, who, at the same age, is as yet destitute of these little instruments. When speaking of the nourishment of infants, it was remarked, that immediately after the first teeth have made their appearance, it will, in general, be proper to allow the child small portions of some of the blandest kinds of artificial food; and that both the quantity and nutritious quality of the aliment should be gradually increased, in proportion as the teeth are successively protruded through the gums. By the time that all the cutting teeth have made their appearance, the child's digestive organs will have acquired sufficient tone and activity to enable them to digest, without difficulty, a simple and appropriate artificial diet; and the system, in general, will have attained a state of developement which renders such a nourishment more suitable to the exigences of the organization, than the less substantial aliment derived from the maternal breast.

This period then—namely soon after all the incisor teeth have made their appearance—ought to be regarded as the proper time for weaning, provided no adverse circumstances, either on the part of the infant or the mother, render it necessary to terminate lactation sooner, or to prolong it to a more advanced age. It is evident, that according to this rule, the proper period of weaning, must vary considerably in different cases. It will seldom, however, be delayed beyond the eleventh month, and in the majority of instances will occur between the ninth and tenth month. I am entirely persuaded, both by experience, and by what appear to be the obvious intentions of nature, that, if the duration of suckling were always regulated by this rule, no inconsiderable amount of sickness and constitutional infirmity, both in relation to the mother and the infant, would be avoided.

Unless urgent reasons exist for an immediate separation of the infant from the breast, weaning ought always to be accomplished in a gradual manner. A sudden transition from the mild and

simple nourishment obtained at the breast, to the exclusive use of a more substantial artificial food, could rarely fail to produce disorder of the digestive organs and bowels, even in the most robust and healthy children. If the mode of management which has already been indicated, in relation to the nourishment of the child be adopted:—that is, if small portions of the most simple and bland kinds of artificial food be allowed after the first teeth have made their appearance, and its quantity and nutritious quality be gradually increased, in proportion as the other incisor teeth come out, the stomach will be sufficiently prepared when the proper period of weaning arrives, to admit of an immediate passage from the nourishment of the breast to an exclusive artificial aliment, with but very little or no risk of unpleasant consequences. When the period of weaning is approaching small portions of bread, bread and milk, milk thickened with rice, or flour, rice, chicken, mutton or beef tea, &c., should be allowed the child, two or three times daily; whilst, at the same time, the intervals of suckling should be more and more prolonged. By this course of management the infant's stomach will be gradually accustomed to a more substantial nourishment, and its attachment to the breast insensibly diminished. When the child manifests great reluctance to a total separation from the breast, we may sometimes facilitate the weaning by applying some offensive substance to the nipples, such as aloes, infusion of colomba, or gentian, assafœtida, or a weak solution of sal ammoniac, &c. Some advantage may also be obtained by accustoming the child, to drink out of a tea-cup, saucer, or glass, and thus teaching it early, to receive its nourishment from vessels of this kind.

After the child has been weaned its principal nourishment ought still to consist of liquid or semi-fluid substances. Milk, milk boiled with bread, or slightly thickened with rice or wheat flour, rice, preparations of arrow root, tapioca or sago, oatmeal gruel, pulverised crackers dissolved in warm water with a little milk and sweetened, should constitute the principal nourishment, until the eye teeth or fangs have made their appearance. Along with these fluid alimentary substances, small portions of bread, bread and butter, and weak and simple broths may be allowed occasionally, with perfect propriety. It is particularly important to guard against too full and nourishing a diet immediately after the weaning has been accomplished. Though gradually brought, in the way just stated, to bear the simpler kinds of solid nourishment when taken at distant intervals, the stomach is readily oppressed and disordered, at this period, if the transition to a substantial diet is abrupt. It will digest small portions of such food, without difficulty, when taken at considerable intervals; whilst a frequent and free use of the same articles, would soon

overwhelm and exhaust the digestive powers, and give rise to a train of distressing dyspeptic affections. The quantity of solid food should, therefore, not be materially increased immediately after weaning: nor should there be any particular increase in the general quantity of nourishment whether solid or liquid, until the stomach has been fully accustomed to the change. After the eye teeth have made their appearance, however, the solid and more nourishing kinds of food should be gradually increased, until the process of primary dentition has been completed—by which time, the powers of the stomach are, in general, sufficiently developed, to admit of a full and substantial aliment.

Circumstances requiring a deviation from the above general rules for determining the duration of lactation. The progress of dentition is, doubtless, our safest guide, in regulating the nourishment of infants, and in deciding on the period, at which they may with propriety be put on the exclusive use of artificial food. Not unfrequently, however, circumstances of an irregular or morbid character, render it expedient, or even indispensable, to wean the child, before it has attained the age and organic developement, which, under ordinary circumstances would be deemed requisite to justify its final separation from the breast.

1. *The mother* may be affected with some constitutional malady, which may so contaminate her milk, as to render it highly injurious to the child's health, if she continues to nourish it at the breast. I have known several instances of extremely distressing affections in infants, obviously produced by the tainted milk obtained from nurses laboring under syphilis. Mothers, affected with scrofula in an active state, or with ulcerated cancer, should, on no account, suckle their infants.

The mother may also be so exhausted and debilitated by an attack of some acute disease, and the depletory measures requisite to subdue it, that she cannot continue to suckle her infant, without increasing her prostration and superinducing a train of alarming and highly distressing affections. The same difficulty is apt to occur, in mothers of a feeble, delicate and nervous habit of body, particularly when the digestive powers are weak, or so disordered that nourishing and substantial aliment cannot be taken. Under these circumstances, suckling can seldom be continued without producing the worst effects. The constant drain of the nutrient elements of the blood, through the breasts, causes a rapid increase of the debility, and gives rise ultimately, to a train of very distressing nervous affections, which cannot be removed or even materially mitigated so long as the infant is nourished at the breast. If the suckling be continued, the appetite and digestive powers fail; severe pains in the head ensue, the nervous

system becomes greatly disturbed; transient pains, alternating with spasmodic twitches or numbness, occur in various parts of the body; the debility and emaciation advance rapidly; a multitude of anomalous nervous affections constantly harass the patient; a most distressing sense of sinking and emptiness, is at times felt in the region of the stomach; the mind becomes disturbed and tormented often with an intense dread of dying, or a constant apprehension of some dreadful accident. At last delirium and even mania sometimes supervene.

I have recently met with a striking example of this kind. The lady—always of an extremely delicate and feeble habit of body—was suckling a robust infant, about four months old, when I first saw her. Her digestive powers were very weak, and her general strength was so much impaired that she was obliged to remain, almost constantly, in bed. At times she experienced violent pains in different parts of the body—most frequently, however, in the back part of the head, and in one of the temples. Her whole nervous system was extremely excitable, and she suffered without intermission, a variety of exceedingly harassing nervous affections, Sometimes she felt a distressing sinking and emptiness in the pit of the stomach; at others, a general numbness extended itself throughout her extremities; often, she experienced alarming palpitation, and almost constantly complained of a benumbed feeling in the tongue, accompanied, occasionally, with an inability to swallow, and rapid spasmodic twitchings of the muscles of the face and extremities. These symptoms were attended with great mental disturbance—manifested by a constant and intense dread of dying, and great apprehensions of some overwhelming misfortune. Not the slightest advantage was obtained from medical treatment, although a great variety of means, apparently adapted to the case, were employed, with anxious diligence, for more than two months. She had repeatedly been urged to wean the infant which she continued to suckle, but always obstinately refused to comply with the request. At length, however, she was prevailed on to wean the child. In the course of three or four days, the symptoms under which she had so long suffered, evidently began to abate; and at the end of the third week, she was entirely freed of her harassing complaint. I have, indeed, often met with cases of a similar character, and the instances of very serious suffering and prostration among young and delicate mothers, from suckling, are probably of much more frequent occurrence than seems to be generally supposed. "Many young ladies," says a late writer, "on becoming mothers, are incapable of supporting the constant drain to which the wants of their infants subject them. They lose their good looks, become gradually weaker and paler, and as their strength declines, they become more and more

afflicted with a variety of harassing nervous affections." Medicinal means are of no permanent advantage. They may procure more or less temporary mitigation of the symptoms, but they are wholly inadequate to the removal of the malady. *Nothing but weaning will suffice*—and the entire separation of the child from the breast, is generally soon followed by a progressive subsidence of the sufferings of the patient. But it is not simply on account of the mother, that weaning becomes indispensable, in cases of this kind; the welfare of the infant, also, is intimately concerned. In nearly all instances where lactation produces the pernicious effects just stated, before the regular period of weaning, the secretion of milk is much diminished in quantity, as well as deteriorated in quality; so that it is not only wholly insufficient to supply the wants of the infant, but moreover often decidedly injurious, in its effects on the infant's digestive organs and general state of health.

The foregoing observations refer more particularly to the necessity of weaning at a comparatively early period after the child's birth, when from the mother's feeble and delicate condition, suckling gives rise to symptoms of exhaustion, and nervous disorder. "Many mothers," says Dr. Hall, "are incapable of suckling longer than three or four months, without producing symptoms of undue lactation, or exhaustion. Delicate females who are enfeebled by hæmorrhage during parturition, or who have been freely depleted, and confined to a very simple and innutritious diet, in consequence of some inflammatory affection soon after confinement, frequently suffer much exhaustion from suckling." If, in the early period of lactation, the mother becomes progressively weaker, with loss of appetite, and increasing symptoms of nervous irritation without any obvious cause, we may suspect exhaustion from suckling as the immediate source of the illness; and should this be the case, nothing but an entire separation of the child from the breast will be adequate to restore her health.

It has already been observed above, that suckling is in general continued much longer than is consistent with the welfare either of the mother or the child. On the part of the mother, the effects of unduly protracted lactation are sometimes extremely pernicious. We not unfrequently see women pale, debilitated, and constantly tormented with dyspeptic and nervous affections, suckling their infants for eighteen or twenty months, and occasionally much longer, without suspecting that their sufferings and ill-health, is the result of exhaustion, from the constant drain of the nutritious elements of the blood which is kept up by the suckling. To relieve this exhausted and disordered condition of the system, medical aid is usually resorted to, and tonics, antispasmodics, alteratives, and nourishing diet freely and perseveringly employed

—but always in vain, and often even, with manifest injury. At length, after the mother has been reduced to a state of great feebleness and general disorder of the vital functions, the child is weaned; and now, what might have been effected in a few weeks, by a timely separation of the child from the breast, can hardly be accomplished in many months, by the most judicious and careful remedial management. Thus irremediable constitutional infirmity and nervousness are sometimes produced at an early period of life, which, under a more rational and prudent course of management, in relation to the duration of suckling, might have been entirely avoided.

Many mothers are able to suckle their children until they arrive at the proper period of weaning, without the least inconvenience, who, nevertheless, will suffer very serious derangements of health, when the nursing is extended considerably beyond the time, which nature points out as the proper period for terminating this important function. When lactation is prolonged, as it often is, until it becomes a source of morbid exhaustion, the first manifestations of its injurious influence consist in an obvious increase of debility, attended with disagreeable sensations in the region of the stomach and head. The digestive powers soon become much enfeebled, and various distressing dyspeptic symptoms ensue; the countenance becomes peculiarly pale and languid; severe pains occur in the head, often confined to the posterior part, or to one side, and a tormenting pain also is usually felt, "just below the cartilages of the false ribs on the left side, or directly below the left breast." Connected with these symptoms, a state of chronic hysteria, or extreme and harassing nervousness almost invariably occurs. Palpitation of the heart and alarming paroxysms of nervous agitation come on, at uncertain intervals; more or less cough generally occurs; the mind becomes despondent, irritable, and in aggravated cases, sometimes, decidedly deranged. Added to these symptoms, there is always more or less emaciation; and ultimately night sweats with slight febrile irritation ensues. The bowels are usually torpid. In consequence of the enfeebled state of the digestive powers, nothing but the simplest and mildest articles of food can be tolerated by the stomach. Articles that are not easily digested, or such as are of an irritating character, seldom fail to produce severe pains and disturbance in the head, and various distressing sensations in the stomach and chest. "In this state of things," says Dr. Hall, "the patient is apt to try to support her strength by a generous diet and wine. This, however, is a vain effort. For the tone of the stomach is already enfeebled, and this organ is therefore altogether incapable of bearing the increased burthen thus put upon it; and wine only induces feverishness, or at least a false and temporary appearance of strength."

I have thus been particular in describing the evil consequences which are apt to result in females of weak digestive powers and nervous temperaments, from unduly protracted suckling, because I am persuaded, that this subject is too much neglected, and that the instances of serious indisposition and suffering from this source of exhaustion, are much more common, than is generally supposed. The proper course of remedial management in such cases, consists in the immediate weaning of the child, in conjunction with the use of a mild, simple, and nutritious diet, and remedies calculated to restore the tone of the digestive organs and improve the alvine secretions.

On the part of the infant, also, suckling when continued much beyond the proper period, is apt to exert a highly injurious influence. It is well known, that after the eleventh or twelfth month, the milk almost invariably becomes diminished in quantity, as well as more or less deteriorated in quality; and in proportion as the lactation is protracted, so will it lose more and more its nutritious and wholesome character. In many instances indeed the milk begins to deteriorate as early as the ninth or tenth month, corresponding in this respect, with the proper period of weaning as it is usually indicated by the progress of dentition. That the child must be liable to sustain injury in its health, when nourished by milk thus depraved is very obvious; and the liability to disease from this source, must of course increase in proportion as the suckling is protracted. Children who are suckled an undue length of time, generally gradually lose their fresh and healthy appearance. The countenance becomes very pale and acquires a languid, fretful and sickly expression. The digestive powers are enfeebled—giving rise to acidity, flatulency, colic, vomiting and diarrhœa. In some instances, the abdomen becomes tumid, firm to the touch and tender, whilst the extremities are progressively emaciating. Strumous swellings are apt to appear on the neck or under the ears; and scabby erruptions on the head and face. It would seem too, that a very decided predisposition to convulsive affections is often created by unduly continued lactation, and Dr. Morton has adduced a number of cases to show that it not only produces a strong predisposition to meningites, but frequently operates as a direct exciting cause of this dangerous malady. He states it as his conviction, founded on experience, " that if children be suckled for an undue length of time, that is, any period beyond nine or ten months, they will be peculiarly liable to be affected with meningites. Or that, should they not become affected with this disease, during or soon after the time that they are thus improperly suckled, they will, nevertheless, acquire therefrom, a predisposition to cephalic disease, at some future period of their lives; and finally, that the same injurious effects,

will take place in infants, if suckled by women who have been delivered an undue length of time, although the infants themselves, may not have been at the breast for too long a time."

In some instances, the milk loses its wholesome properties at an early period of lactation, without any very serious or obvious derangement of health in the maternal system. When this occurs, the infant, often, throws up the milk again, soon after nursing, and becomes harassed with colic, griping, acidity and diarrhœa, attended with paleness, debility, emaciation, and frequently with scabby eruptions about the face and head. If the child becomes affected in this manner, when nourished exclusively at the breast, we may presume, that the milk has become depraved and injurious to its digestive organs. If any doubt exist as to the agency of the milk in the production of the disorder, the breast should be withheld from the child as long as can be done without any particular inconvenience to the mother, and artificial nourishment, or the milk of a nurse substituted. If the mother's milk has been the cause of the child's illness, an obvious abatement of the symptoms will soon take place; and should this occur, the child ought to be gradually entirely separated from the maternal breast.

Mental inquietude, deep grief or sorrow, and other violent affections of the mind, have a strong tendency to deprave the milk. Women of a very nervous habit and an irritable temper, are peculiarly liable to those mental perturbations which are apt to deteriorate this nutrient secretion. "Those mothers," says Dr. Struve, "who are so unfortunately situated that they cannot avoid provocation, grief, or sorrow, as well as others who possess an irrascible and bilious temperament, or are subject to great nervous debility, accompanied by great susceptibility of every stimulus, will confer no benefits on their children by presenting them with a corrupted milk, which cannot fail to injure their health, and lay the foundation of fatal maladies."

The recurrence of the menses, during lactation, exerts, in many cases, a decidedly prejudicial influence on the properties of the milk, and often renders weaning necessary, long before the usual period of separating the child from the breast. I have, in several instances, where menstruation had returned as early as the sixth month, known the child to become extremely ill, evidently caused by the deteriorated character of the milk, in consequence of the renovated menstrual function, as was demonstrated by the speedy return of health, after weaning was accomplished. The reappearance of the menstrual evacuation, moreover, renders the lactescent female more liable to the recurrence of *pregnancy*—a con-

dition which invariably lessens the quantity of the milk, and in some instances deteriorates its quality. Neither the appearance of the menses, nor the occurrence of pregnancy during lactation, however, can be taken as a positive and constant indication of the propriety or necessity of weaning. Occasionally, infants are kept at the breast, while the catamenia are regularly recurring, and during the early period of pregnancy, without receiving the slightest apparent injury. The reverse nevertheless frequently takes place, and weaning becomes indispensable to the welfare of the infant. When therefore the mother finds the child becoming sickly, feeble, and annoyed with disorder of the stomach and bowels, after menstruation has returned, or after she finds herself in a state of pregnancy, and relief is not obtained, in due time, from the use of appropriate remedial means, the child ought to be gradually weaned. "Should a woman," says Dr. Morton, "with an infant at the breast, again become pregnant, one of two things will usually take place; either she will miscarry, or her milk will become impoverished in quality and diminished in quantity. It was not intended by nature that the processes of pregnancy and lactation should go on simultaneously; but, on the contrary, that the one should commence when the other had terminated; and experience sufficiently proves, that they will not proceed well together: the reason of which, as it appears to me, may be easily given. During pregnancy, and particularly during the latter periods, the vessels of the womb gradually enlarge, and a much greater quantity of blood than usual is determined to that organ for the increase and perfection of the embryo, and its appendages; which after delivery becomes transferred to the breasts to supply the material for the secretion of the milk: but if during pregnancy, lactation be also persevered in, the blood becomes directed, at the same time, to two different parts of the body, somewhat remote from each other; and hence, neither is likely to receive its due proportion of this vital fluid, and consequently the functions of one or the other, or of both, are liable to become impeded or suspended. If the breasts continue to receive a sufficient quantity of blood, the secretion of milk goes on properly, but the womb is deprived of its necessary supply; the embryo, in consequence, languishes and dies, and, becoming an extraneous body, is thrown off, producing abortion: while, on the other hand, should the womb still obtain its due proportion of blood, the breasts are robbed of it, and the secretion of milk, if not altogether suppressed, is rendered either deficient in quantity or deteriorated in quality."

If from causes of this kind, it occasionally becomes necessary to separate the child from the breast sooner than would otherwise be deemed proper, circumstances may also occur, which will render

it expedient to protract the duration of suckling, beyond the period that might be indicated by the progress of dentition, or the mere age of the infant. The child may be laboring under some disease, or it may be in a very debilitated condition from previous disease—or its digestive organs may be weak and irritable, at the regular period of weaning. Under such circumstances, it would undoubtedly be improper to wean the child, unless good reasons existed for believing that the milk had become decidedly unwholesome. The bland and congenial nourishment obtained at the breast, could hardly be substituted by the mildest artificial food, without retarding the progress of the child's convalescence; and in a very debilitated condition of its digestive powers, such a transition could hardly fail to give rise to very serious affections. Children should never be weaned when they are sick, unless the indisposition is found to have been produced or to be supported by an unwholesome state of the milk (Dewees).

Some attention should also be paid to the *season* of the year, in fixing on the period of weaning. In general, weaning may be accomplished with less inconvenience and risk of unpleasant consequences to the child, during the mild months of April, May, September, October, and the early part of November, than whilst the weather is inclement. Exercise in the open air, is always highly beneficial to the child, at the time of weaning. It tends, in no inconsiderable degree, to fortify the system of the child, and to enable its digestive organs to bear without inconvenience, the change of nourishment. In consequence of the peculiar tendency of warm weather to excite cholera infantum, particularly in cities or large towns, it is in general inexpedient to separate children from the breast, during the months of June, July and August; for it has been abundantly ascertained that the transition from the maternal milk to an exclusive artificial nourishment, during this season, has a decided tendency to favor the occurrence of this dangerous malady. Nevertheless, should the child be manifestly suffering from a deteriorated state of the milk, it ought to be separated from the breast, without any regard to season; for a bad condition of the milk, would doubtless, be more injurious in this respect than a suitable artificial nourishment.

CHAPTER VIII.

CLEANLINESS. WASHING. BATHING.

The skin is one of the most extensive and important emunctories of the human system. Through its countless pores, a large portion of the secrementitious elements of the body are continually passing. Whatever interferes with the regular action of these emunctories, or impedes the free elimination of the perspirable materials of the blood, becomes a source of more or less serious disease; and on the other hand, every thing that tends to maintain a healthy activity of this function, contributes, very largely to the preservation of a healthful condition of the system.

Cleanliness is a most important requisite for keeping up a healthy state of the skin. When ablution is neglected or inadequately attended to, particles of perspirable matter, together with the dust which settles on the cuticle, insinuate themselves into the pores, and spread a film of impurities over the whole surface. This, not only interferes with the regular progress of the cutaneous transpiration, but tends, moreover, in no slight degree, to disorder the healthy structure of the cuticle and cutis, and, ultimately, to give rise to protracted and dangerous constitutional maladies. Children who are neglected in this respect, are much more apt to suffer severely from the contagious eruptive fevers, incident to childhood, than those whose skin is kept clean and pure. The tendency of a foul state of the skin, to give rise to various chronic cutaneous disorders, of a loathsome and harassing character, is well known. Itch, scabby eruptions on various parts of the body, tetrous affections, painful and offensive excoriations and herpetic disorders, are often the result of uncleanliness of the body. The general health, too, is liable to be impaired, by an habitually unclean state of the surface; and it unquestionably predisposes the system to the occurrence of indigestion, and other forms of gastric and intestinal disease. The agreeable feelings which entire cleanliness is calculated to produce, as well as the excellent moral influence which it is capable of exerting on the mind, are, in themselves, of sufficient moment to claim for it the most solicitous attention. Children, who are early accustomed to the comfortable and healthful impressions of washing and bathing, will rarely, in after life, neglect the observance of personal cleanliness; and those, on the contrary, who are neglected,

in this respect, during childhood, will seldom manifest a proper regard for this physical virtue, in the subsequent stages of their lives.

Infants ought to be thoroughly washed over the whole surface of the body once every day until they are weaned. After this period it will in general be sufficient to make the ablutions once every other day. The water ought to be *warm* during the first three or four months. It should then be reduced to *lukewarm*, and continued at this temperature until the progress of primary dentition is completed, when it ought to be still further reduced until it excites a decided sensation of coolness when first applied to the body. The washing should be performed with a soft sponge or a piece of soft linen; and particular care taken to remove the impurities which are apt to remain in the folds of the skin and joints. In addition to this indispensable means of preserving a pure and healthful condition of the skin, *bathing* must not be neglected. The bath ought to be used every other day, during lactation, and afterwards at least twice every week. The regular use of the bath seldom fails to exert a highly salutary influence on the system, and ought never to be regarded as superfluous even as a means of cleanliness, however carefully the general ablutions be attended to. Until the end of the third year at least, the bath ought to be tepid; and for feeble and sickly children it will be proper to continue the use of *tepid water* for this purpose to a more advanced age. When the child is healthy and vigorous, however, the *tepid*, should be gradually substituted by the *cool* bath after the third year; though injury is, probably, much more frequently done, by too early a transition to the *cool*, than by too long-continued a use of the tepid bath. In using the bath, the child's body ought to be immersed up to the shoulders or neck. The practice of immersing only the lower half of the body in the bath, is decidedly objectionable. The upper part of the chest being wet, and exposed to the cooler temperature of the air, generally feels chilly or uncomfortably cold, while thus partially immersed in the tepid water—a situation which is well calculated to give rise to catarrhal and other inflammatory affections of the respiratory organs.

The time during which it may be proper to remain in the bath must be varied according to the age of the child. For the first four or five weeks, the infant should not be kept beyond two or three minutes in the bath—and the duration must, afterwards, be gradually prolonged, as the child advances in age, until it extends to twelve or fifteen minutes—a period which a child may, with propriety, be allowed to spend in the bath after it has attained the age of four years.

It is to be particularly observed, that children should never be

permitted to enter the bath while they are in a state of free perspiration from exercise—a precaution which is especially important when the water is below the tepid temperature.

The best time for bathing children is about two hours after breakfast or dinner. Infants should not be put in the bath immediately after having been freely nourished at the breast. To obviate the risk of taking cold, the bathing ought to be conducted in a room heated to a comfortable degree of temperature; and on removing the child from the bath, it should, without delay, be wiped perfectly dry, and immediately invested in warm and dry linen. "Infants may then be placed in bed, which in winter should be previously warmed; and they will generally fall into a refreshing sleep, attended with a gentle and beneficial perspiration. Children, further advanced in age, who have already been accustomed to the cool bath, need not be put to bed, but rather induced to take exercise after it in the open air, though much depends here on the circumstance, whether they have been bathed in warm, cool, or cold water. If warm water has been used, the child should be immediately put to bed; for nothing is more apt to predispose to the injurious effects of cold than warm bathing." In that general tendency to increased perspiration which is produced by the tepid bath, every draught of air, and especially the sudden removal to a cold atmosphere, is peculiarly apt to give rise to catarrhal and other febrile affections. After cool-bathing, on the contrary, no apprehensions of injurious consequences need be entertained from exposure to the open air; and active exercise, after coming out of such a bath, exerts, in general, a very salutary influence on the health and feelings of the individual (Struve). "In rough weather, however, it is more advisable to keep the young party, after bathing, for half an hour in the nursery, where they may run about according to their own pleasure, and then enjoy the fresh air, but with strict injunctions not to sit down on the grass."*

Some writers advocate the use of cool and even cold water, both for washing and bathing infants; and many mothers pursue this practice under the fallacious idea that it tends to invigorate the infantile system and fortify it early against the injurious influence of cold and sudden changes of temperature. Reference is usually made to the custom, in some countries, of plunging newborn infants into cold water, as an evidence of the propriety and usefulness of this practice; and it cannot be doubted, that of those, whose strong constitutional energies enable them to pass safely through this severe process of hardening, many may ultimately be benefited by its inuring tendency. It is well known, however,

* On the Domestic Education of Children. By C. A. Struve, M. D.

that many infants perish, at an early period, in consequence of this cruel and unnatural exposure; and that, in general, those only who are endowed with vigorous powers of life, are able to sustain its depressing influence, without injurious consequences. Warmth is peculiarly congenial to the physical habits and sensibilities of the infantile system. Until birth, the infant is surrounded by a medium of the temperature of its own body; and there can be no doubt, that its sensibility to cold, for some time after birth, must be such as to render its impressions very distressing and painful. Cold is a sedative or debilitating agent, in its direct and essential operation on the animal system. The increased activity which sometimes follows the application of cold, is caused by the reaction of the vital powers, after their temporary depression; but when the system is feeble, the depression caused by the cold, is often so great, that the powers of life are incapable of developing a healthy degree of reaction, and more or less permanent prostration and disorder of the system, is the inevitable result. Feeble and sickly children ought to be as little exposed to low temperature as possible, until, by a judicious course of management, their systems are gradually inured to its chilling and depressing influence. The use of cold or even cool water, for washing and bathing very young infants of weak constitutional powers, is frequently attended with the most unhappy consequences, and always, with a great deal of suffering. Even robust and vigorous infants often manifest, by their screams, and their protracted paleness, shrunken appearance, and tremor of their bodies, the painful and depressing effects produced by being washed in cold water. Instead of being invigorated, they are frequently enfeebled by this practice; and before they become inured to the impressions of the cold or cool water, serious catarrhal, febrile, or bowel affections may be caused by its tendency to check the perspiration, destroy the regular balance of the circulation, and depress the vital powers. By the use of tepid water, on the contrary, the cutaneous exhalents are gently excited, without the risk of suspending their action, or of causing a sudden and dangerous revulsion of blood from the surface to the internal organs; at the same time, that the congenial temperature of the bath, produces an agreeable and salutary excitement throughout the whole system. In urging the propriety of using *tepid*, in preference to *cool* water, however, it is proper to observe that the employment of *decidedly warm* water for bathing children, is not, in general, advisable, except during the first few weeks after birth, or as a remedial agent, in certain states of feebleness and disease. *Warm* bathing, by its tendency to over excite the exhalents of the skin, is apt to produce a state of general relaxation and languor, unfavorable to the regular performance of the vital

functions, and to predispose the system, very strongly, to the injurious influence of cold. Children, who are often bathed in warm water, are apt to acquire a susceptibility to the impressions of low temperature, which renders them much more liable to catarrhal and other affections, from exposure to the open and cold air, than those who are habitually bathed in tepid or lukewarm water. As a general rule, the temperature of the bath ought to be about 98° of Fahrenheit during the first ten or twelve days. It should then be progressively reduced, about one degree every month, until the end of the first year, and continued at this degree of warmth until the completion of the second year. After this period the temperature must be further lowered, though in a very gradual manner, until about the end of the third year the bath creates a sensation of decided coolness. In relation to this subject, however, regard must be had to the particular condition of the child with regard to its constitutional vigor, predispositions, and health. Weak and sickly children, generally require a greater degree of warmth, and a more cautious transition to cool bathing than such as are robust and healthy; and this observation is especially applicable to those who are strongly predisposed to bowel complaints, or to cutaneous eruptions.

BOOK II.

OF THE DISEASES OF CHILDREN.

CHAPTER I.

OF SYNCOPE, ASPHYXIA, AND IMPERFECT RESPIRATION.

In the majority of instances, the child begins to breathe and cry, and the various functions of independent life commence their circle of action, as soon as it is ushered into the world. This, however, is not always the case. Many children manifest no signs of animation when born, in whom, nevertheless, the spark of life still lingers, and may, occasionally, be re-excited by prompt and judicious management. This state of apparent death, may depend either on an apoplectic condition, or on syncope, or on great feebleness and exhaustion of the vital powers. When it depends on an apoplectic state of the brain, the infant's countenance exhibits a livid or deep red and bloated appearance—the prolabia are purple or almost black, the eyes prominent, and the surface of the body warm, reddish and somewhat tense. This condition generally arises from a tedious and difficult passage of the infant's head through the pelvis, and particularly from the umbilical cord being wound tightly round the child's neck, impeding the return of the blood from the head, and thereby causing inordinate sanguineous congestion in the brain. This apoplectic condition is produced, also, by the unceasing and vehement uterine contraction, which is often excited by *ergot;* for infants who are still-born, or in a state of asphyxia, after the efficient administration of this substance, generally exhibit very strong marks of

excessive vascular turgescence in the head. Indeed, it is difficult to conceive, how a long-continued and powerful action of the uterus could fail to produce dangerous or fatal sanguineous congestion in the brain. The water, by which the fœtus is surrounded, being wholly incompressible, the entire force of pressure exerted by the womb, must necessarily act directly upon the child, and cause so great a compression of the more yielding parts of the body, as nearly to arrest the circulation in them—the inevitable consequence of which must be, an excessive accumulation in the brain, heart and lungs, parts that are protected against external pressure, by the bony walls which enclose them. This is probably the ordinary manner in which ergot, when exhibited under circumstances unfavorable to the speedy completion of labor, proves injurious or fatal to infants.

In some instances of this kind, the child is born without any manifestations of life whatever. Its face is swollen and livid, the body flaccid, and the navel string has ceased to pulsate. Although but very little hope can be entertained of recovering an infant in this condition, it ought not to be immediately abandoned without making suitable efforts for the resuscitation of its vital powers. As almost every thing, in such cases, depends on the speedy removal of the congested condition of the brain, the umbilical cord should be immediately cut, and an effort made to strip some blood from it with the fingers. It is but very rarely, however, that any blood can be obtained in this way, and never after the heart has ceased to pulsate. I think it probable, that a sufficient quantity of blood might be abstracted, by dividing the cord within about an inch of the umbilicus, and applying a wide-mouthed cupping-glass, furnished with an exhausting pump, over the navel and its short portion of cord. By exhausting the cup, the blood would, doubtless, flow from the extremity of the cord, even perhaps, after the heart had ceased to act; and it appears to me not unlikely, that a considerable influence might, thus, be exerted in re-exciting the circulation. The child's head should be supported in an elevated position, and the inferior parts of its body wrapped in dry and warm flannel. In conjunction with these measures, an effort should be made to excite the respiratory function, by arti-

ficial inflation of the lungs, and compression of the thorax with the hands, so as to imitate the alternate acts of inspiration and expiration. In inflating the lungs, the accoucheur must apply his mouth to that of the infant, at the same time closing its nostrils, and endeavor, by a moderate but uniform force of insufflation, to fill its lungs with air. During this effort, the child's chest should be a little raised, and its head slightly thrown backwards, to facilitate the entrance of the air into the larynx. Dr. Dewees says, that the attempt to expand the lungs must be by a "*forcible*" insufflation—an advice which may readily lead to very unfortunate consequences. It appears, from a series of experiments, made a few years ago in France, on animals, and from observations relative to the human subject, that no very great force of insufflation is necessary, to rupture the delicate air cells, and cause a fatal emphysema of the pulmonary structure. In sheep, and in the dead human subject, the air cells were ruptured by a force of insufflation, not greater than that which may be made by a person of ordinary respiratory vigor, without any very violent effort.

It is not improbable, I think, that "forcible" efforts to inflate the lungs of infants born in a state of asphyxia, has often resulted in fatal rupture of the pulmonary air cells. To obviate this very unfortunate accident, the air ought to be thrown into the respiratory passages, through a silk handkerchief folded double, or a fine napkin, laid over the mouth of the infant. This, I am persuaded, is a very useful precaution, and should never be neglected, when artificial inflation of the lungs is attempted. Of the tendency of forcible insufflation to rupture the air cells of the lungs, I had a very striking illustration, a few years ago. I attended a lady in a tedious and rather difficult labor. The child was still-born; but I nevertheless made some efforts to effect a resuscitation. I inflated the lungs in the usual way. The child, however, did not recover. A singular tumor situated just above the middle of the left clavicle, induced me to ask permission to examine it with the scalpel. The tumor extended a short distance into the thorax, in following which, I opened the chest. On raising the sternum, I found the superior portion of the left lung in a complete state of

emphysema, and a good deal of air diffused under the anterior and lateral surface of the pulmonary pleura. With the exception of the inferior portions, both lungs were crepitous, and appeared to have been well inflated. That the emphysema was the result of rupture of the air cells, caused by the forcible inflation, and not of putrefactive decomposition, I could not doubt; for up to within about two hours of the termination of the labor, the child's motions were distinctly felt both by the mother and myself.

When the umbilical cord continues to pulsate, in infants, born in this apoplectic or oppressed condition, relief may, in general, be speedily obtained, by promptly dividing the cord, and suffering more or less blood to flow from it. When the cord beats vigorously, nothing more is, generally, required for setting the vital functions in play, than the prompt abstraction of blood in this way. As the blood flows, the lividity and turgid state of the countenance, usually, disappear, and in a short time the infant begins to breathe. The efficacy of this measure may, in general, be enhanced, by supporting the infant's head in an elevated position, applying cool water to the scalp, and immersing the inferior extremities and hips in the warm-bath.

When the pulsation of the cord is slow and feeble, inflation of the lungs is frequently requisite, in addition to the abstraction of blood in the way just mentioned, in order to excite the respiratory organs into action. Artificial respiration, however, is very rarely capable of procuring any decided advantage in cases of this kind unless aided by the loss of blood. Whenever the face is turgid and livid, accompanied, as is usually the case, with signs of general sanguineous repletion, bleeding from the divided cord, is a measure of paramount importance. It is proper to observe, however, that in cases unattended with these manifestations of cephalic congestion and general fulness—that is, when the face and body present a pale and shrunken appearance, blood cannot be abstracted without incurring much risk of injury.

Some infants, who are ushered into the world with great rapidity, by a quick succession of vehement parturient contractions, remain for a minute or two without any, or but a few, imperfect respiratory efforts, although they will open their eyes and move

their extremities with sufficient activity. A few drops of cold water sprinkled on the chest and abdomen, will instantly cause them to breathe and to cry out lustily. The main point of caution, in cases of this kind, is to avoid tying the cord until its pulsation has ceased, or has become quite feeble. The pulsation, in these cases, is always very strong, and generally continues longer than in ordinary instances. I have known the respiration to become immediately much embarrassed and the face to assume a livid aspect, on the application of a ligature to the cord, while pulsating actively, although the child had previously breathed and cried very strongly.

In all instances where respiration does not ensue, or is embarrassed, immediately after birth, prompt attention should be paid to the speedy removal of the viscid mucus which is usually lodged in the mouth, fauces, and larynx, of new-born infants. In many cases, breathing is much impeded by this cause; and in some instances, the quantity and viscidity of the mucus is so great, as entirely to obstruct the entrance of the air into the lungs. To dislodge this mucus from the fauces, a finger surrounded with a piece of soft linen, should be carefully introduced, and the tenacious slime brought away from the posterior part of the mouth. The child should then be turned with its face downwards, and the body raised higher than the head. In this position, the child's back (between the shoulders) should be patted with the hand, and its body gently shaken, "so as to disengage any mucus that may be lodged in the trachea, and permitting it to flow out of the mouth, by making this the depending part" (Dewees).

Infants are sometimes born in a state of asphyxia, without any signs of cerebral congestion or vascular fulness; the surface of the body being pale, and the face free from the puffiness which occurs in the apoplectic or congestive cases. If, in instances of this kind, the cord continues to pulsate, it must, on no account, be divided, until the pulsation has ceased. The viscid mucus should be immediately removed from the fauces and larynx, in the manner just mentioned; and a little cold brandy, spirits, or even water, dashed on the pit of the stomach. This, almost always, immediately excites the respiratory actions; and nothing further is necessary, until the pulsation of the cord has ceased, when it

must be divided, and the child suffered to remain quiet, until its strength is in some degree recruited. Should these measures fail to excite the respiration, which however rarely happens, so long as the cord beats actively, advantage may sometimes be obtained from the application of some volatile stimulant to the nostrils and lips—such as brandy, hartshorn, spirits of camphor, or ether. It will, also, be proper to rub the body and extremities, gently, with dry warm flannels. If, notwithstanding the employment of these means, respiration do not commence, while the pulsation of the cord becomes more and more feeble, or wholly arrested, the chance of ultimate success must be regarded as exceedingly slender. When the pulsation of the umbilical cord has ceased, and the child is flaccid, every effort must be made to keep up the natural temperature of the body, by the external application of warmth, and to excite the respiratory function by artificial inflation. The cord must be divided, and the infant wrapped in dry and heated flannel. I agree, perfectly, with Dr. Dewees, in giving a preference to dry warmth, by heated cloths, over the warm-bath. Experience has convinced me, that the former is a much more efficient means, for imparting warmth and exciting the feeble remains of vitality than the latter. It seems probable that, *water* may, in some degree, counteract the exciting effects of *warmth*, by its strong tendency to abstract the electric fluid from the body. Flannel, being a very imperfect conductor both of electricity and heat, is, doubtless, the best medium, in cases of this kind, for applying warmth to the body. The heated cloths ought to be frequently renewed, so as to keep up a uniform temperature, and their application continued as long as there may be any hope of ultimate success. At the same time that warmth is thus diligently imparted to the infant's body, the efforts to excite respiration by alternately inflating the lungs and compressing the chest, in the way mentioned above, should be regularly and cautiously persisted in until the child begins to breathe, or there is reason to think that all further exertions must necessarily prove fruitless. Infants, in this condition, should not be hastily abandoned. I have in several instances known more than thirty minutes to pass under the employment of these resuscitating means, before the child began to respire; and cases have occurred in

which resuscitation was effected after a much longer period of exertion.

Dr. Underwood thinks that the electric influence might be advantageously employed in cases of this kind: and, from the extraordinary tendency of galvanism to excite muscular action, even after the animal functions are entirely abolished, it can scarcely be doubted that much benefit might sometimes be derived from this active and pervading agent. This, however, is one of those means, which though capable perhaps, of doing much good, can very rarely be brought into use, on account of the delay which must necessarily always occur in procuring the apparatus and putting it in action.

Respiration generally commences by a short and deep spasmodic inspiration or sob, which, at first, recurs at considerable intervals, becoming, gradually, more and more frequent and complete, until the respiratory function is established. Occasionally, however, instead of a progressive improvement in the action of the lungs, the respiratory efforts become more and more imperfect, after the first two or three forcible sobs, until the vital actions are entirely arrested, notwithstanding the continued exertions to excite and support them. Sometimes the respiration, when established, is for several hours so feeble, that the slightest fatigue or agitation is apt to arrest it, and exhaust the languid powers of life. In all instances, where a resuscitation has been effected from a state of asphyxia, it is of the utmost consequence to suffer the infant to lie perfectly at rest, for several hours, before it is subjected to the agitation and fatigue of washing and dressing. When the respiration is very feeble, a strict attention to this precaution is indispensable to ultimate success. There can be no doubt, that many infants have died in consequence of the fatigue and prostration caused by washing and dressing, during the very feeble and exhausted condition which often succeeds recovery from a state of apparent death immediately after birth. An instance of this kind occurred to me about six years ago. The infant was born in a state of asphyxia. Its face was neither livid nor bloated, and the cord pulsated feebly. By the employment of the usual resuscitating means, it soon began to breathe, but in a very weak and sobbing manner. I had it wrapped in warm flannel and laid on a bed. By the time I left the room, its breathing had

become regular, and it made some feeble attempts to cry. I earnestly enjoined that it should be left perfectly at rest, until I called again. I had not left the house more than an hour, before I was hastily summoned to visit the infant, with a message that it was dying. The child was dead before I arrived. I learned that as soon as I had left the house, the grandmother of the infant insisted that agitation and motion would "stir up life," and proceeded forthwith to wash and dress the infant in no very gentle manner. The immediate result was fatal exhaustion. It is of great importance, also, to continue the external application of warmth until the respiration is fully established, and the child is able to cry out strongly. In applying the heated cloths, however, care should be taken to agitate the child's body as little as possible. Some advantage may be obtained from applying a few drops of warm wine and water to the infant's lips and nostrils; and I have known manifest benefit derived from gently washing the face with a very weak mixture of warm spirits and water.

The preceding observations relative to the prostration which often succeeds recovery from a state of apparent death, are equally applicable to infants born in a very feeble condition, and to the majority of those who are born prematurely. Rest and warmth, in such cases, are all-important requisites for the gradual development of the vital functions. Infants born between the seventh and eighth month, generally remain in a somnolent state, for several weeks, and ought to be as little disturbed by washing, dressing, feeding, or in any other way, as possible. When they are very feeble, it will be most prudent to leave them perfectly at rest, for several days before they are subjected to the fatigue of washing and dressing. Dr. Dewees mentions two children born a little after the sixth month, who were neither washed nor dressed "for many days," and both recovered.

Occasionally, feeble infants—particularly such as are much exhausted in consequence of a partial separation of the placenta or compression of the cord during labor, suddenly sink into a state of apparent death or syncope after respiration has been fully established and every thing seems to go on in a favorable manner. Without any obvious cause the infant becomes pale, cold, flaccid, the breathing very feeble and interrupted, and finally

wholly arrested; the countenance shrunk, the eyes fixed and half open, the hands livid, and the pulse extinct (Dewees). This death-like condition usually continues a few minutes, and then gradually passes off, leaving the child in a languid and fretful state for many hours. These attacks are apt to recur at uncertain intervals, "unless the disease be arrested by suitable remedies, or death closes the scene." The few instances of this affection that have come under my notice, were attended with manifest disturbance in the alimentary canal; and Dr. Dewees observes that "a small quantity of very green fluid is almost always discharged from the bowels during the fit." In one of the cases I witnessed, several copious discharges of a thin dark-green matter occurred, immediately after the attack had subsided. The affection is doubtless the result of intestinal irritation, in conjunction with a feeble and irritable condition of the system; and we accordingly find, that the employment of remedies calculated to correct the functions of the liver and intestinal canal, rarely fails to prevent a recurrence of the attack. During the paroxysm, efforts must be made to re-excite the vital powers, by a prompt recourse to external stimulating applications. The child's body should be wrapped in a piece of thick flannel wrung out of hot whiskey or brandy; a little warm water and wine may be thrown into the rectum; and a drop of ether, spirits of camphor, or sharp vinegar, should be applied to its nostrils and lips, and weak sinapisms laid on the soles of the feet. Under the influence of these exciting applications, the suspended functions of life usually return, in a gradual manner, until the action of the heart and lungs are fully re-established. To prevent the recurrence of the affection, recourse must be had to remedies calculated to correct the functions of the liver and alimentary canal. A few minute doses of calomel—that is, from one sixth to a fourth of a grain, given in the evening, and followed on the succeeding morning, by four or five grains of rhubarb, or a teaspoonful of castor oil, generally produces an excellent effect in such cases. Great care must also be taken to prevent the infant from over-distending its stomach with nourishment.

With regard to the proper time for tying the umbilical cord, writers have expressed different opinions. Baudaloque, Denman,

White and Dewees, maintain that "we can never safely depart from the rule, that '*the cord is not to be tied until the pulsations of the umbilical arteries have ceased.*" Mr. Burns, on the other hand, observes, that "when the child is vigorous and cries lustily, there is no occasion of delay in tying of the cord until it has ceased to pulsate." That very serious injury may result to infants from tying the cord, whilst it pulsates *actively*, even when the respiration is fully established, does not admit of a doubt; and, although the cord may, in general, be tied without the slightest unpleasant consequences in vigorous infants breathing freely, after its pulsation has become *decidedly feeble*,—yet, as a general rule, it is unquestionably safest to delay the tying, until the cord has entirely ceased to pulsate. When the cord is tied whilst pulsating strongly, the breathing, sometimes, instantly becomes irregular, catching and feeble, and the countenance turgid and livid. Some years ago, I witnessed a striking instance of the evil effects which may be produced by the premature ligature of the cord. The infant breathed freely and cried out lustily, as soon as it was born. I waited three or four minutes, until the cord pulsated feebly, and then tied it. As soon as the ligature was drawn, the breathing became catching, irregular, and in a few moments almost wholly suspended, and the lips acquired a deep livid hue. I immediately divided the cord below the ligature, but obtained only a few drops of blood from it; and it was with the utmost difficulty, and only in a very gradual manner that the action of the lungs and heart were fully re-established.

Injury may also result to the child, from too long a delay in putting a ligature on the cord, or separating it from the placenta. When the uterus contracts very powerfully soon after the birth of the child, the blood contained in the placenta, may be pressed out of it, as from a sponge, and engorge the vessels of the infant to a degree which may prove highly injurious and even fatal. I am convinced that I have seen several instances of alarming consequences from this cause, after the employment of ergot for hastening the labor. When ergot is given in the latter stage of labor, the womb is apt to contract with great energy upon the placenta, immediately after the expulsion of the infant; and it cannot be doubted that, when this takes place, the blood contained in the

placenta must be more or less powerfully forced into the vascular system of the infant. I have known an infant to breathe and cry strongly for a short time, and then, suddenly, on the occurrence of a strong uterine pain or contraction, to fall into an oppressed condition, with a turgid and livid countenance, and feeble, interrupted and suffocative respiration, and a state of apparent insensibility. When, after respiration has been established, and the cord remains united, phenomena of this kind supervene, the cord ought to be immediately divided, and the blood suffered to flow until the symptoms of oppression are removed.

CHAPTER II.

OF THE MECONIUM.

The fœcal matter formed in the bowels of infants, before birth, is called *meconium*, and consists of a dark green, yellowish, or party-colored residual substance of a viscid and semi-fluid consistence. When this recrementitious matter is retained in the bowels of the new-born infant, it seldom fails to give rise to intestinal irritation, and more or less general disorder of the system. Exhausting and painful diarrhœa, colic, mucous inflammation of the intestines, obstinate jaundice, convulsions, trismus, induration and enlargement of the mesenteric glands and consequent wasting of the body, disease of the liver, erysipelas with induration of the subcutaneous cellular tissue, not to mention other forms of distressing and dangerous disease, may, it is believed, arise from the irritation occasioned by meconial matter in the alimentary canal. The timely removal of this substance from the bowels, is therefore an object of no small degree of importance. Nature, in general, furnishes the appropriate purgative for this purpose, in the first milk or *colostrum*, secreted in the maternal breasts; and, in many cases, nothing more is necessary for the expulsion of the meconium, than the early application of the infant to its mother's breast. The small portion of fluid which the child, usually, obtains at the breast, during the first nine or ten hours, possesses a decidedly purgative character, and generally causes the entire evacuation of the meconial matter. As the colostrum is formed before the proper milk begins to be secreted, the child ought to be early put to the breast, in order to obtain this purgative fluid, before it becomes diluted and weakened by the milk. When the first suckling is delayed until the breasts are filled with the lacteous secretion, the bowels frequently remain unmoved, and recourse must be had to other means for removing the meconium. There

can be no doubt, that, in general, the colostrum is fully sufficient for effecting the expulsion of this substance from the bowels; and, as it was evidently intended for this purpose by the author of nature, it must be regarded as decidedly the most appropriate means for freeing the infant from this source of intestinal irritation and disease. The practice of at once resorting to purgative remedies for the removal of the meconium is highly reprehensible. Instead of putting the child early to the breast, and waiting for the operation of the congenial laxative prepared for it by nature, the almost universal custom is, to introduce some purgative substance into its stomach, such as castor oil, syrup of rhubarb, senna tea, magnesia, sweet oil, manna, or molasses, as soon as the infant is washed and dressed. When we reflect, that the stomach of the new-born infant has as yet never experienced any foreign impressions, and must necessarily be extremely delicate and susceptible, the impropriety of introducing such irritating articles into it, immediately after birth, and before the digestive powers have been brought into action, appears very obvious. The stomach is thus often thrown into a state of severe irritation and functional derangement, which if it does not lead to speedy death, never fails to give rise to a train of extremely harassing consequences. Long experience has fully convinced me, that the distressing dyspeptic affections—the colic, acidity—painful diarrhœa, and general sickly condition, so frequently met with during the first five or six months of infancy, very often have their origin in the gastro-intestinal irritation, caused by the purgatives employed for evacuating the meconium. The purge, given for this purpose, acting on the delicate and highly sensitive stomach, weakens, at once, its digestive energies; the very first nourishment that is taken, is, therefore, but imperfectly digested; more or less fermentation, consequently, occurs in the primæ viæ, by which acid and other irritatory matters are generated, and additional sources of gastric irritation furnished. Unless judicious dietetic and other remedial measures be immediately adopted, a train of painful dyspeptic and general irritative affections will ensue, and soon acquire an ascendency, which can seldom be wholly subdued during the period of infancy.

Although the undue retention of meconial matter in the bowels,

is certainly very apt to prove detrimental to the health of the infant, yet it is by no means necessary to resort at once, to the use of purgative remedies for its removal. It was undoubtedly the design of the Creator, that this office should be performed by the *colostrum;* and there need be no harm apprehended, from the delay, which a dependence on this purgative secretion may require. Instead of giving to the infant an artificial laxative, let it be early applied to its mother's breast before the proper milk is secreted, and in nine cases out of ten, adequate purgation will be produced, without the slightest risk of injurious irritation of the stomach and intestinal canal. When the colostrum or first milk fails to produce the desired effect, recourse should, unquestionably, be had to artificial means for expelling the meconium from the bowels; and for this purpose a teaspoonful of molasses diluted with a small portion of warm water, or a solution of manna, or a teaspoonful of cold-pressed castor oil, should be given and repeated until the requisite evacuations have been procured. Rapid and free purging, however, is improper. A moderate action of the bowels, procured by gentle means, is fully adequate, in a great majority of cases, to dislodge and remove the meconial matter in due time. It is of importance, however, to keep up a moderate degree of purgation until the meconium is completely removed; for the retention of even small portions of this substance, may ultimately give rise to very unpleasant consequences.

Sometimes, though very rarely, cases occur in which very great difficulty is experienced in exciting an efficient action of the bowels. In such cases purgative enemata ought to be employed, in conjunction with laxatives administered in full and repeated doses, until the requisite effect is produced. Dr. Dewees, relates a remarkable instance of intestinal torpor of this kind, in which, after frequent doses of castor oil and magnesia with injections of various kinds and the warm bath had been used without any advantage, relief was ultimately obtained from a grain of carbonate of soda administered every fifteen minutes until ten grains were taken. In a few very obstinate cases of this kind, I have succeeded well with a mixture of Ipecacuannha and rhubarb assisted by purgative enemata. Two grains of ipecac. with five grains of powdered rhubarb, may be given every hour until free evacuations are

produced. The warm bath will, in general, promote the operation of the purge, and exert a favorable influence on the general system, by its tendency to keep up a regular action of the cutaneous exhalents. The extraordinary torpor of the intestinal canal, which sometimes occurs immediately after birth, depends, probably, in most instances, on cerebral congestion; for I have frequently noticed that those infants who are born with a turgid and livid appearance of the face, and other manifestations of preternatural fullness of the vessels of the head, are much more apt to resist the purgative powers of the colostrum, and to require artificial purgations for the removal of the meconial matter, than such as are free from symptoms of cerebral congestion. Immersing the legs and lower portions of the abdomen in a bath, raised to as high a temperature as the infant can bear, without pain, at the same time that a piece of flannel wet with cold water is applied to the top of the head, frequently has an obvious effect in facilitating the operation of the purgatives that may be given in such cases. An instance which quite recently came under my notice has convinced me, that much advantage may sometimes be derived from this mode of management, where there is difficulty encountered from intestinal torpor in procuring the evacuations of the meconium. The infant had taken three teaspoonfuls of castor oil with ten grains of rhubarb in conjunction with the repeated use of injections without the desired effect. Thirty hours after birth no alvine evacuation had taken place. The little patient lay in a state of partial stupor; its abdomen was distended and evidently very sore to pressure. In this state the lower parts of its body were placed in warm water, while cold applications were made to the head. In less than five minutes after these measures were resorted to the bowels began to act, and four or five copious evacuations ensued in the course of three or four hours.

CHAPTER III.

ON THE TONGUE-TIE.

It frequently happens that the tongue of infants is so tied down, and restrained in its actions by a preternatural conformation of its frænum, that sucking is rendered extremely difficult, and, if it be not remedied, the power of articulating words, at a more advanced age greatly embarrassed.

In the majority of instances, the part which ties down the tongue consists of a thin transparent membrane, extending from the fleshy part of the frænum to near the extremity of the tongue. Dr. Dewees considers this transparent, membranous production as an adventitious formation, wholly distinct from the proper substance of the frænum. It appears to me, however, to be a mere membranous prolongation of, and perfectly continuous with the structure of the frænum. In some instances, instead of this membranous prolongation, the thick and fleshy frænum itself is extended forwards in the same way, so as to confine the tongue and embarrass its actions. When the tongue is in this condition, the infant is incapable of elevating it, or protruding it beyond the lips; sucking is performed with great difficulty, and attended with a peculiar "clucking" noise in the fauces. When the infant attempts to suck, the nipple is constantly slipping from its lips, from an inability to grasp it firmly with the tongue. It alternately seizes the nipple, and after a few imperfect efforts, lets it slip again, until it becomes fatigued and irritated with its fruitless exertions, and begins to fret and cry.

When the portion of the frænum which restrains the actions of the tongue in this manner, is *membranous*, it ought, of course, to be immediately divided. According to my own experience, a pair of small blunt-pointed scissors is the most convenient and safe instrument for dividing this membrane. Dr. Dewees, however, prefers a gum lancet for this purpose. The child must be taken

into a good light, and laid across the nurse's lap with its face upwards. In this position the operator should insinuate the extremity of the forefinger of the left hand, between the side of the tongue and the corresponding portion of gums, and push the tongue upwards, whilst with the thumb of the same hand the lower jaw is depressed. The frænum may thus, in general be exposed to view, and the stretched membrane divided by one stroke of the scissors or gum lancet. Crying often facilitates the operation considerably, by exposing the membrane freely and putting it on the stretch. There is seldom more than a few drops of blood discharged from the divided membrane. By carelessness and with improper instruments, however, very serious mischief has been done, even in cases of this kind. About twenty years ago I witnessed an instance, where a young physician, in endeavoring to divide the membranous portion of the frænum, with a pair of sharp-pointed scissors, pierced a blood vessel under the tongue, which occasioned an extremely alarming hæmorrage. Just as he was about clipping the membrane, the infant suddenly threw its head upwards, and plunged the points of the scissors in, under the tongue. Sharp-pointed instruments ought never to be used for this purpose. No one can be entirely secure against accidents of this kind, in the sudden and active struggles which infants are apt to make during the operation.

When the tongue is tied down, by the proper, fleshy frænum extending too near its extremity, nothing can, with propriety, be done towards remedying the evil. Dr. Dewees, has "never ventured to do any thing in cases of this kind." This variety of the tongue-tie is indeed very rarely so great, as to give rise to any serious difficulty of sucking; and the advantages to be gained from a division of the frænum, are by no means adequate to justify an operation attended with so much risk of alarming consequences. Very alarming and even fatal hæmorrage has been the result of this operation, and authors mention convulsions and "swallowing of the tongue," as occasional consequences.

CHAPTER IV.

OF THE INFLAMMATION AND SWELLING OF THE BREASTS OF NEW-BORN INFANTS.

New-born infants are liable to a singular inflammation and enlargement of the breasts, which though very rarely attended with any serious consequences when properly managed, has often been converted into a very painful and dangerous affection by the ignorant and rude officiousness of nurses and others. The common opinion among mothers and nurses, is that these swellings arise from the accumulation of milk in the infant's breast, and, "that it must be squeezed or milked out, that they may be cured." Every effort is accordingly made, by squeezing, sucking, pressing, &c. to extract the supposed fluid, and as no milk can be obtained, the inflammation which often follows this rude treatment, is usually ascribed to the retention of the milk in the breast, and considered as a direct proof of the correctness of this opinion. I have met with several instances, in which this preposterous and highly injurious practice, brought on violent inflammation, which soon terminated in extensive suppuration of the breast, and in one case—a female infant, both breasts were entirely destroyed.

These swellings come on immediately after birth; and it has been supposed, though I think erroneously, that they are generally formed before the infant is born. They are somewhat tense, elastic, and firm, and appear to consist of a moderate degree of inflammation of the cellular membrane with serous infiltration into this tissue. When the inflammation is aggravated, it extends itself to the mammæ, and the skin becomes purplish over the central parts of the tumor. Occasionally, though, indeed, very rarely, the inflammation, even under a proper course of management, becomes severe and continues for five or six days before it begins to subside. I have, however, never known a case of this kind to

terminate in suppuration and abscess, except where the inflammation was aggravated by rough handling in the commencement.

In moderate cases Dr. Dewees applies nothing more than "a piece of linen moistened with a little sweet oil;" and where the swelling and inflammation are considerable, he recommends the application of a bread-and-milk poultice, renewed every three or four hours. These are doubtless appropriate and useful remedies; but it has appeared to me, that in the ordinary cases of this affection, a weak solution of the muriate of ammonia in vinegar and water—in the proportion of a drachm of the ammonia, to four ounces of water with the same quantity of common vinegar, acts much more promptly and certainly in reducing the swelling and inflammation, than either sweet oil or emolient poultices. The solution ought to be applied warm, by moistening pieces of linen with it, and laying them over the affected parts. I have seldom used any other application than this one, even where there was a considerable degree of inflammation. When the swelling and inflammation become severe, a few leeches, applied to the parts, succeeded by warm emolient poultices, will in general prevent the occurrence of suppuration.

CHAPTER V.

OF INFLAMMATION AND ULCERATION OF THE NAVEL.

Inflammation and consequent ulceration about the navel is a frequent occurrence during the first nine or ten days after birth. This may arise from irritation occasioned by rude management in washing and dressing the navel, before the cord has been thrown off; or it may be the result of a slow and imperfect separation of the cord, in consequence of which it remains attached by a thin and firm filament and prevents the healing of the navel. Frequently, too, it arises from deficient attention to cleanliness, in the first washing of the infant; for if the white caseous matter, which is found deposited on its skin, be not carefully washed off from about the umbilicus, it soon acquires a very irritating character, and gives rise to inflammation and excoriation of the navel. This, I am well satisfied is by far the most common source of this disagreeable affection of the navel. Children who are not properly freed of this peculiar caseous deposition, where it occurs in abundance, almost invariably suffer more or less irritation and inflammation about the navel. Of the tendency of this white matter, to inflame and excoriate, the skin, when not properly removed, we often have abundant evidence on various parts of the body—particularly in the folds of the skin about the neck, joints, nates and groins.

When the navel becomes irritated and inflamed, it soon acquires a deep red, excoriated and fungoid condition, discharging a thin, offensive and purulent matter, and evidently causes much suffering and uneasiness to the infant. In some instances, the navel presents an elevated ulcerous surface, with an inflamed condition of the surrounding skin, and a copious discharge of thin irritating matter; in other cases, the central part of the navel shoots up a

kind of fungous excrescence, of a dark-red and excoriated appearance, with but little surrounding inflammation or actual ulceration. This fungoid tumor sometimes assumes a button-like form, with a narrow base, and a round expanded head like a cherry; in other cases, the tumor is broad at the base, tapering towards the top, or exhibiting nearly a cylindric form.

When the navel becomes excoriated or ulcerous and discharges matter, while the cord remains attached by a filament, the simple division of this slight connexion will often suffice to arrest the progress of the ulceration, and dispose the navel to cicatrize. Whenever the cord is so far separated as to retain only a simple filamentous connection with the umbilicus, the separation ought to be completed by clipping the filament with a pair of scissors, whether there be inflammation and ulceration or not; for if this partial connection is suffered to continue after the usual period of separation, it, of course, prevents the healing, and almost invariably causes severe inflammation and ulceration of the navel.

When the fungoid little tumor in the bottom of the umbilical cavity has a narrow base, it may, in general, be speedily removed by passing a ligature round the pedicle, and drawing it sufficiently tight to arrest the circulation, without cutting into its substance. A strong silk thread will answer very well for this purpose. In the course of a few days, the tumor, usually, drops off, after which the part should be dressed with saturnine ointment, spread upon lint. Should the fungus, however, shoot up again, it must be repressed by astringent applications, or destroyed with one of the milder escarotic remedies. I have found the root of the *sanguinaria canadensis* very finely powdered, an excellent escarotic in cases of this kind. A small portion of the powder should be put on the fungus, once or twice daily, and covered with lint spread over with a little lead ointment. When the surface and margin of the umbilical cavity are excoriated, and the discharge of matter is copious, advantage may be obtained from the occasional application of a solution of sugar of lead, or what is better, a weak decoction of oak bark.

In cases where the tumor is broad at the base, and where, of course, ligatures are inapplicable, recourse must be had to suitable astringents and escarotics. Dr. Dewees recommends "a

pretty strong solution of the nitrate of silver," applied by means of a camel hair pencil, "and repeated until the part heals." The nitrate of silver is an excellent escarotic where the surface of the tumor is ulcerated or raw and spongy. In some instances, however, these excrescences are of rather a firm texture, and covered with a fine membrane—and in such cases, this escarotic is always extremely slow in destroying the tumor. I have occasionally used a strong solution of the sulphate of copper, with a satisfactory result in instances of this kind. One drachm of the sulphate should be dissolved in an ounce of water, and applied twice daily by means of a camel-hair pencil or a dossil of lint. We may frequently reduce these tumors without any escarotic applications, by means of strong astringents constantly applied, as is often done with hæmorrhoidal excrescences. Very finely pulverized oak bark, or Aleppo galls, sprinkled on the tumors, will sometimes cause them to shrink, at the same time that it tends to subdue the surrounding inflammation and to arrest the purulent discharge from the umbilical cavity. In the last case of this kind which occurred to me, I directed the nurse to drop a pinch of oak-bark powder, upon the excrescence thrice daily, and to wash the parts carefully with lukwarm water, every morning and evening; and the result was perfectly satisfactory.

When the navel presents an elevated, ulcerous surface, we may often do much good by touching the ulcerated part very lightly with lunar caustic, and applying saturnine ointment, spread on lint, over it. If there is much inflammation of the navel and adjacent parts, a soft poultice made with lead-water and crumbs of bread, forms an excellent application. A solution of the sulphate of copper, in the proportion of ten grains to an ounce of water, may be applied with much advantage, when there is superficial ulceration, without much inflammation. It should be applied once or twice daily, and the part afterwards covered with lead ointment. Sprinkling the ulcerated surface with white lead, or with powdered oak bark or galls, will, in slight cases, frequently restore the parts to a healthy condition, without any other applications. I have seen prompt and very decided benefit derived, in a very aggravated case of ulcerated navel, from washing the part, twice daily, with a decoction of the wild indigo

root, (*baptisia tinctoria*). The best mode of applying this article, however, is in the form of a liniment, made by slowly simmering the coarsely powdered root in cream, and afterwards squeezing it through a thick piece of linen or flannel. This should be applied with a soft pencil or feather, three or four times daily; or a piece of lint may be moistened with it, and laid over the ulcerated surface. I have repeatedly applied this liniment, to excoriated and ulcerated nipples, and generally with great advantage.

Cleanliness is an important observance in cases of this kind. Whatever applications may be made, the parts should be carefully washed with lukewarm water, at least twice daily, and where the discharge is particularly offensive, or copious, the parts immediately surrounding the umbilical cavity should be washed or carefully wiped clean, with a soft piece of linen wrung out of warm water, repeatedly during the day.

CHAPTER VI.

OF THE JAUNDICE OF INFANTS.

Newly-born infants are liable to an icteric state of the skin which though generally of a very slight and transient character, requiring little or no attention, sometimes assumes a degree of violence and obstinacy which calls for prompt and active remedial measures.

In a great majority of infants, this yellowness of the skin comes on within three or four days after birth, unattended by any manifestations of indisposition; and after having remained stationary, for a few days, gradually disappears, without any unpleasant consequences. This peculiar discoloration of the skin is, generally, regarded as wholly distinct from jaundice, and altogether independent of hepatic derangement, or deposition of bilious matter under the cuticle. "It is difficult," observes Dr. Dewees, "to

say, to what this yellow tinge may be owing; certain it is, it cannot be attributed to the presence of bile, since neither the urine nor the white of the eyes assume the yellow hue." It may be doubted, however, whether either of these facts can with propriety be regarded, as "certain" evidence, that the yellowness in question, is independent of bilious matter, since a temporary secretion of the carbonaceous matter which during fœtal life is secreted by the liver, may it is presumed, take place into the rete-mucosum without showing itself either in the urine or in the eyes. Nor does the assertion, that the urine is always free of bilious matter accord with my own observations; for since my attention has been particularly directed to this subject, I have not met with one instance, where the urine did not acquire a slight bilious hue, about the time the yellowness of the skin was going off, although previously of a perfectly natural color. The liver appears to be the principal depurating organ, during the uterine stage of life. As soon as the infant is born, however, a large share of this office is transferred to the lungs and the skin. The skin at the same time, suddenly becomes highly engorged with blood, as is manifested by the redness and fulness which usually occurs a short time after birth.—It becomes the principal seat of sensibility and sensation, and its transpiratory function, is for the first few days, performed in a feeble and imperfect manner. It seems probable, therefore, that whilst these changes in the excretory functions are going on, the blood may become slightly charged with recrementitious matter of a bilious or carbonaceous character, and that in the irritable and congested condition of the skin to which we have just referred, a portion of this matter may be deposited on the rete-mucosum or cutis, without any actual morbid derangements either of the liver, or of the general system.

When the infant does not become restless and fretful and takes its nourishment freely, and the alvine discharges are manifestly colored with bile, this yellowness of the skin requires no particular attention, as it will pass off spontaneously, in the course, generally, of three or four days, without any unfavorable effects, either immediate or remote. But when the white of the eyes becomes yellow, the urine charged with bilious matter, the bowels costive, and the stools whitish or clay-colored, accompanied with an inclination to

vomit, or with actual vomiting, and an anxious and distressed expression of the countenance, the disease is evidently connected with more or less serious disorder of the biliary organs, and should be promptly opposed by a suitable course of remedial measures. When along with these symptoms, there is fever, and a swollen and tender state of the right hypochondriac and epigastric regions, the worst consequences are to be apprehended; for cases of this kind, frequently resist every curative effort that can be made, and proceed with increasing violence to a speedy termination in death, or assume a chronic character, with progressive emaciation of the extremities, and tumefaction and hardness of the abdomen, until the vital powers are consumed. Fortunately, however, these dangerous cases are not common. In by far the greater number of instances, the disease is not attended with any violent and disorganizing form of hepatic disorder, and, though manifestly dependent on biliary derangement, is of a comparatively mild and manageable character.

The exciting causes of infantile jaundice are, doubtless, very various, Mr. Baumes thinks that meconial matter unduely retained in the bowels, is frequently concerned in the production of the disease; and Mr. Gardien expresses the same opinion. Dr. Underwood does not believe that the meconium can have any part in producing jaundice, except, perhaps, by obstructing the orifice of the biliary duct, for which it seems to be well adapted by its peculiarly viscid and adhesive consistence. I am inclined to think, however, that this writer has not attached sufficient importance to this recrementitious substance as a source of jaundice, in newly-born infants. To whatever circumstance it may be ascribed, I am persuaded that this disease occurs more frequently where there is delay and difficulty experienced in purging off the meconium, than where this substance is easily and entirely evacuated during the first twenty-four hours. It is, indeed, not probable that the yellow color of the skin is, in any degree, derived from absorbed meconial matter; and it may well be questioned whether any portion of this recrement is ever absorbed into the circulation. The way, perhaps, in which retained meconial matter contributes to the production of infantile jaundice is, by exciting irritation in the intestines, and, in conjunction with other causes, particularly

the purgatives that may be employed for the removal of this substance, giving rise to mucous inflammation of the duodenum and consequent functional derangement of the liver, or obstruction to the flow of bile into the bowels. That a morbidly irritable or inflamed condition of the mucous membrane of the duodenum, is apt to give rise to jaundice is well known. "A curious pathological fact," says Dr. Johnson, "has lately been fairly established—namely, that irritation or inflammation of the mucous membrane of the duodenum, will sometimes produce jaundice, where no obstruction can be detected in the biliary ducts." Cases of this kind are always attended with excruciating paroxysms of pain in the region of the duodenum, an hour or two after taking nourishment, resembling the pain produced by the passage of a biliary concretion through the common bile duct. I have met with several cases of this variety of the disease, in adults, which, after all the usual remedies for jaundice had been ineffectually tried, were speedily cured, and without a single recurrence of the pains by an exclusive liquid mucilaginous diet, and the application of a blister to the epigastrium. It is highly probable, that the jaundiced appearance which occurs in yellow fever, depends, mainly, on the gastro-duodenal inflammation so universally connected with that disease. In relation to infantile jaundice, my own observations have satisfied me, that, in some instances at least, this disease is the immediate result of mucous inflammation of the upper portion of the intestinal canal. In a dissection which I made about two years ago, of an infant that had died in a state of deep jaundice, apparently in consequence of inflammation of the liver, I found the mucous membrane of the duodenum in a highly diseased condition. Some parts of it were of a uniform scarlet color,—others were softened to the consistence of jelly, and of a gray or ashy hue, and in several places it was entirely destroyed and removed, leaving the muscular tunic bare. The orifice of the bile duct was slightly tumified, but the duct was pervious throughout. The liver was much engorged with blood, but exhibited no other obvious marks of structural lesion. Improper artificial nourishment during the first two or three days after birth, and the exhibition of irritating purgatives for the removal of the meconium, are doubtless frequently concerned in the production of this dis-

ease. The gastro-duodenal irritation which is apt to be excited in this way, can seldom fail to produce more or less functional derangement of the liver; and when the duodenal irritation passes into a state of actual inflammation, jaundice may result, either from spasmodic closure of the mouth of the common bile duct, in consequence of the extremely irritable condition of the duodenum, or from sympathetic irritation with excessive sanguineous engorgement of the liver, and consequent functional torpor. In cases attended with a highly irritated or sub-inflamed condition of the duodenum, there is usually much sickness and frequent vomiting of a glairy fluid; the epigastrium is tender to pressure, and the little patient is affected with occasional paroxysms of violent screaming and agitation, particularly some time after taking nourishment.

In some instances the disease is unequivocally attended with inflammation of the liver. The right hypochondrium becomes tumid, tense, and tender to the touch. The fever is strong, the respiration short and oppressed, and almost every attempt to move or lift the infant, immediately increases its sufferings and causes it to scream out with anguish.

Very frequently, however, the hepatic derangement upon which the jaundice depends is entirely unconnected with inflammation. The liver may be in a state of inactivity from excessive sanguineous engorgement; or its torpor may depend on induration with or without enlargement, or on some other form of structional disorder. In cases of this kind there is, in general, but little or no febrile irritation. The infant is apt to fall into a drowsy and languid condition, with weakness of the digestive functions, acidity, vomiting, and flatulent colic pains. The disease usually assumes a chronic character, attended with progressive emaciation, and derangement of the alimentary canal. Instances depending on excessive sanguineous congestion of the liver, are usually attended with manifest indications of a general plethoric condition of the system. It has appeared to me that jaundice, from this cause, is most apt to occur in those infants, who are born with a turgid and livid appearance of the face and body, and an oppressed state of the brain—more especially where the vessels are not promptly relieved by abstracting blood from the divided cord.

Without doubt, too, infantile jaundice, may in some instances depend on obstruction to the regular flow of the bile, from spasmodic constriction of the biliary canals, wholly independent of any local or general inflammatory excitement. Mr. Gardien, observes that spasmodic constriction of the biliary pores may be occasioned by, the sudden exposure of the newly-born infant to cold air or water—the constringing impressions of which, may be sympathetically conveyed from the skin to the hepatic system. When we advert to the intimate relation which subsists between these two organs, and the extremely sensible and excitable state of the skin, immediately after birth, we can scarcely doubt that the disease may, be prod ced in this way.

Treatment.—It has already been stated that in the ordinary cases of yellowness of the skin—when the infant does not manifest any obvious indications of indisposition, and the alvine discharges continue to be colored with bile, no active treatment is required. The customary warm bathing for preserving a pure and healthful condition of the skin, and a proper attention to the state of the infant's bowels—promoting their action, when they are torpid, and restraining it when there is a tendency to griping and diarrhœa, is in general all that is required in cases of this simple character.

When the disease is not attended with an inflamed condition of the liver, though obviously connected with derangement of the biliary organs—that is, when the skin and eyes are yellow, the urine bilious, and the stools whitish or clay-colored, without any soreness or tenderness to pressure in the right hypochondriac and epigastric regions, much benefit may sometimes be derived from emetics. In cases of mere congestion and inactivity of the liver, or in hepatic torpor from any cause, the concussive operation of an emetic frequently proves highly beneficial by accelerating the circulation in the portal system, exciting the action of the liver, and relieving its congested condition, by determining the blood from the internal to the external parts of the body. A few grains of ipecacuanna should be given every fifteen or twenty minutes until vomiting is produced; and when the disease is obstinate, the emetic may be advantageously repeated, every other day, until the alvine evacuations acquire a bilious appearance. In all in-

stances, however, of a manifestly inflammatory character, attended with fulness, tension and unequivocal soreness of the region of the liver and stomach, emetics cannot be employed without considerable risk of injurious consequences. The bowels ought to be freely evacuated in the commencement of the treatment; and for this purpose calomel and castor oil appear to be the most suitable means. A fourth of a grain of calomel should be given every two hours, until two or three grains have been taken. If free purging does not ensue, the operation of the calomel must be promoted by castor oil, given in teaspoonful doses every hour, until the desired effect is obtained. After the bowels have been once freely evacuated, they must be kept in a loose state, by administering a fourth of a grain of calomel every morning noon and evening, with an occasional teaspoonful of castor oil, should the torpor of the intestines render an additional purgative necessary. Calomel is a valuable medicine in every modification of infantile jaundice, on account, both of its aperient effects on the bowels, and its specific operation on the biliary organs, and general capillary system. In conjunction with these remedies, the daily use of the warm bath, is often decidedly beneficial; and when the infant can bear it without manifest suffering, gentle frictions with the bare hand, over the region of the liver and stomach, repeated several times daily, frequently produces an obviously salutary effect in cases of this kind. It need scarcely be observed, that frictions of the abdomen would hardly fail to prove injurious in cases attended with hepatic inflammation or abdominal tenderness. It is only when the region of the liver and stomach may be pressed without causing the infant to cry or manifest increased distress and sufferings that frictions can be used with propriety—and when this is the case, they almost always prove decidedly beneficial.

When infantile jaundice is attended with a febrile condition, and symptoms indicative of hepatic inflammation—such as fulness, and tenderness in the region of the liver—a very scanty secretion of high-colored urine, absence of the respiratory motions of the abdominal muscles, frequent nausea and vomiting, and an expression of pain and suffering in the countenance, a treatment more decidedly antiphlogistic is required. Four or five leeches, if they

can be procured, ought to be applied to the right hypochondrium. The local abstraction of blood, by leeches, in cases of this kind, is of the utmost importance, and ought never to be omitted, where it is practicable. In violent cases, the application of a small blister to the region of the liver, will often procure very considerable relief. No injurious consequences need be apprehended from a vesicatory, at this early stage of life, if managed with proper care. I have in several instances, where the liver appeared to be in a state of inflammation, resorted to the application of a blister, with unequivocal advantage. The plaster should not be suffered to remain on the skin longer than about two hours. The skin generally becomes slightly inflamed by this time; and if the plaster be now removed, and a soft warm poultice laid over the part, a fine blister will be raised, without harassing the infant. The bowels must be freely evacuated with calomel, aided by castor oil. A half a grain of calomel should be given every two hours, until two or three grains are taken, and followed by a teaspoonful of castor oil, every two hours until active purging is produced. When the stomach is very irritable, however, and there is reason to apprehend the existence of a highly irritated or subinflammatory condition of the mucous membrane of the stomach and superior portions of the intestinal tube—that is, where there is frequent vomiting of a glairy fluid, with occasional fits of agitated screaming and manifest distress soon after taking nourishment into the stomach, together with tenderness and tension of the epigastrium, it will be better to employ minute doses of calomel and ipecacuanna without the castor oil, and promote their action on the bowels by laxative clysters. I have in a few cases employed these two articles, according to the formula given below,* with a very satisfactory result. A dose should be given every two hours, in conjunction with the administration of laxative enemata, until adequate evacuations have been procured. The same powders, or minute portions of calomel without the ipecacuanna, must afterwards be regularly given every morning, noon, and evening, until the alvine discharges become conspicu-

* R. Submuriat. Hydrarg. gr. iii: Pulv. Ipecac. gr. ii; Sacher. Alb. gr. xii. Mix and divide the whole into 12 equal parts.

ously bilious. No ill effects need be feared from ipecacuanna in this irritable and irritated state of the primæ viæ. When exhibited in very small doses, so far from exciting or irritating the stomach, it generally exerts a decidedly calming and anti-emetic influence, and almost always promotes, to an evident degree, the aperient operation of the calomel. In cases of this inflammatory character, some advantage may be derived from the application of a large warm emolient poultice over the upper part of the abdomen, and frequently renewed so as to keep it warm. In some instances the calomel fails to excite the action of the liver, and causes injurious irritation of the mucous membrane of the bowels, giving rise to frequent small turbid watery discharges, attended with severe griping and increased abdominal tenderness. When this occurs, we may sometimes obtain the desired mercurial influence on the liver, by applying a mercurial plaster over the region of this organ, or by the internal use of a quarter of a grain of Dover's powder in union with half a grain of finely powdered dry and hard mercurial mass, exhibited every morning, noon and evening. A fourth of a grain of Dover's powder, in conjunction with a grain of the bi-carbonate of soda, given every three or four hours, is an excellent remedy for allaying the intestinal irritation and exhausting diarrhœa which sometimes occurs in the advanced stages of the disease.

In general calomel and purgatives are the means upon which our main reliance should be placed in treatment of this malady. The bowels are usually very torpid, and considerable difficulty is often experienced in procuring the necessary evacuations. It is seldom, however, that any more active purgatives are required than the articles already mentioned, in conjunction with laxative enemata. Should this necessity occur, we may safely, and with almost certain success add from eight to ten drops of spirits of turpentine to the dose of castor oil. I have resorted to this mixture, in cases of this kind, with the happiest effect.

The vegetable alkalies have a very beneficial tendency in certain modifications of this disease. The bi-carbonate of soda, is especially useful in cases of a chronic character, unattended by symptoms of active abdominal inflammation. A grain of this alkali, dissolved in a teaspoonful of carbonated water, or a teaspoon-

ful of the common soda mineral water, (of the strength of sixty grains of soda to ten ounces of carbonated water,) given at intervals of two or three hours, is well adapted to do good, where there is a deficiency of bile in the bowels, by its direct tendency to prevent fermentation and the consequent generation of acid and other irritating substances in the primæ viæ, and by promoting the regular peristaltic action of the bowels. After the alvine discharges have become bilious, the regular exhibition of both the soda and calomel should be discontinued, and the bowels kept in a loose state by small doses of castor oil, or the occasional administration of an injection. In *chronic* cases of infantile jaundice, considerable advantage may, sometimes, be gained, from the use of the *extract of dandelion*, in union with bi-carbonate of soda. Ten grains of the extract, dissolved in about a teaspoonful of warm water, together with two grains of the soda, may be given three times daily. It generally keeps up a regular action of the bowels—excites the urinary secretion, and appears to produce a salutary effect upon the biliary organs, and general capillary system, as may be inferred, from the gradual subsidence of the abdominal fulness and tension, and the disappearance of the yellowness of the skin, under its use. In a case which I attended a few months ago, the disease gradually increased in violence under the use of small doses of calomel, and ipecacuanna. The abdomen became distended and hard, and the skin of a deep yellow color. The calomel was finally omitted, and ten grains of the dandelion with two grains of soda administered three times daily. In a few days after the use of this remedy was commenced, the disease began to abate, and gradually disappeared altogether.

In cases attended with severe flatulent and spasmodic pains of the stomach and bowels, three or four grains of assafœtida, dissolved in a few tablespoonsful of warm water, and injected into the rectum, will generally afford much relief. We may also administer two or three drops of sulphuric æther in a teaspoonful of *hop tea*, with decided benefit in such cases. The infusion of hops is, indeed, a most excellent palliative in the jaundice of infants. It does not interfere with the action of the necessary laxatives, and along with its anodyne effects, generally exerts a decidedly favorable influence on the digestive functions. When the disease

depends on engorgement and torpor of the liver, without structural lesion, Gardien recommends the use of the black oxide of iron, with the yolk of an egg. Two or three grains of the former, beat up with a yolk of an egg, given three times daily, is said to produce excellent effects, in some instances of this kind.

CHAPTER VII.

OF THE RETENTION AND SUPPRESSION OF URINE.

Some urine is probably, in most instances, secreted, and deposited in the bladder, before the infant leaves the womb; for, in the majority of cases, a discharge of urine occurs, within a very short time after birth. Sometimes, however, the kidneys appear to remain inactive, and little or no urine is evacuated for many hours after the birth of the infant. I have met with several instances where a period of upwards of twenty hours elapsed before a sufficient quantity of urine was secreted and collected in the bladder to excite an evacuation. It is of great consequence, in cases of this kind, to acertain whether the non-occurrence of the urinary discharges, depends on a suppression of the secretion from torpor or inactivity of the kidneys, or whether the urine though adequately secreted, is retained in the bladder in consequence of some obstruction to its discharge, or deficient contractile power of the bladder. When there is but little or no urine secreted during the first fifteen or twenty hours after birth, the infant seldom manifests any uneasiness that can be referred to this cause; but when the renal inactivity is protracted much beyond this period, the consequences may be very serious and even fatal. Cases of this kind are, indeed, extremely uncommon. I have seen but one instance of very protracted *ischuria renalis*, in a newly-born infant. The child was born about 10 o'clock in the evening. On the following morning I was informed that it had as yet voided

no urine. It appeared to be quite healthy, and free from uneasiness. I ordered a teaspoonful of weak parsly-tea, with two drops of sweet spirits of nitre every twenty minutes. In the evening, I found the child in a drowsy state, and restless. I assured myself that the bladder was empty, by the introduction of a very small catheter. The warm bath was ordered, and frictions over the abdomen and loins, with a mixture of juniper-oil, and tincture of squills. Internally three drops of sweet spirits of nitre, together with four drops of the vinegar of squills were given, every half hour in a teaspoonful of wild carrot-seed tea. Next morning the little patient was in a state of complete stupor—the respiration slow, weak and irregular, and the eyes insensible to light. On the following night it died. I was not permitted to make a post-mortem examination. In general, the action of the kidneys is readily excited, where the urinary secretion is slow, or suppressed, during the first nine or ten hours after birth. A few teaspoonfuls of parsly or wild carrot-seed tea, with two or three drops of sweet spirits of nitre, given every half hour, and the warm hip bath, (after the bowels have been freely evacuated,) are generally sufficient to excite the secretory action of the kidneys. Should these means fail to produce the desired effect, recourse may be had to friction over the loins and hypogastric region, with warm vinegar of squills, or a mixture of about a drachm of juniper oil with an ounce of sweet oil, or with the expressed juice of onions diluted with water; and internally, to the exhibition of a few drops of the vinegar of squills, a drop of spirits of turpentine in a teaspoonful of milk or four or five drops of the expressed juice of roasted onions, every thirty or forty minutes; in conjunction with warm bathing, laxatives, and if necessary laxative enemata.

When there is *retention* of the urine—that is when the urine is regularly secreted, and conveyed into the bladder, but cannot be discharged in consequence of a spasmodic constriction or mechanical obstruction of the urethra, or perhaps, deficient contractile power of the muscular coat of the bladder, the phenomena, consequences and appropriate mode of management are very different from those which belong to *suppression* of the urinary secretion. Instances of more or less complete *retention* of the urine, immediately after birth are by no means uncommon. Obstruction of

the urethra or of the neck of the bladder by viscid and inspissated mucus, is probably the most frequent cause of retention of the urine in newly-born infants. When by the gradual accumulation of the urine, the bladder becomes considerably distended, the infant begins to manifest pain and distress, which is obviously increased by pressure made with the hand upon the hypogastric region. The distended bladder may be more or less distinctly felt above the pubis; the infant is restless, its countenance has an expression of suffering and distress, and its legs are constantly drawn up, to relieve the pressure of the abdominal muscles. If the obstruction be not removed, the abdomen gradually becomes more and more enlarged by the distended bladder, and acquires, at last, a tense and shining appearance, with the superficial veins, very much enlarged and turgid with blood. If relief be not obtained, rupture of the bladder finally takes place, and death is the inevitable consequence. The bladder sometimes becomes enormously distended before ulceration or rupture takes place. Dr. Dewees gives an account of a very remarkable instance of this kind, in which Dr. Parrish drew at one time eighteen ounces of urine from the bladder. The child did not recover. A few years ago I was called to consult in a case of this kind. The attending physician was a very young man, and tampered with inefficient means until it was too late. Before I arrived the bladder had yielded to the distending force, and the urine was extravasated into the cavity of the peritoneum. Of this I satisfied myself by a post-mortem examination.

In some cases, after the bladder has become much distended, small portions of urine are, from time to time evacuated, although the quantity retained, is progressively increased; and this occurrence almost always misleads the nurse, and often even the medical attendant, and removes every suspicion of urinary difficulty. The urine is thus gradually accumulated, and the manifest distress and suffering is ascribed to other causes, until the bladder, at last, gives way, and the infant dies in great agony from peritoneal inflammation. I am persuaded that infants sometimes die in this way, who might easily be saved if the real cause of its sufferings did not thus escape the attention of the practitioner. "We have strong reasons to believe," says Dr. Dewees, "that

many have died of suppression (*retention*) of urine, though we were assured they had passed water—the same was insisted on, for awhile in the case (referred to above) just mentioned, and perhaps there may have been a small discharge, as always happens when the bladder becomes excessively distended." When the infant becomes restless and fretful, and persists in keeping its legs drawn up, and particularly when we are informed that its abdomen is swollen and hard, the region of the bladder should be carefully examined, and no reliance placed on the nurse's declaration, that the urine is regularly evacuated, if there is the slightest reason on examination, to suspect an accumulation of urine in the bladder.

The external urinary passage ought always to be carefully examined in newly-born infants. I was once called into the country, to visit an infant, which, I was told, had not discharged any urine since its birth. I saw it about forty hours after birth, and found it evidently in a state of very great suffering. The bladder was very much distended, and could be easily felt beneath the abdominal muscles. On examining the urethra, for the purpose of introducing a small flexible bougie, I found its orifice closed, by a thin semi-transparent membrane, about the tenth of an inch below the surface, or extremity of the passage. I divided it with a sharp-pointed bistory, and the urine instantly gushed out with much force. Sometimes the prepuce is entirely closed. I have seen two cases of this kind. In one there was a very small opening, scarcely admitting a pin's head, and altogether insufficient to admit of the discharge of the urine; in the other case, the closure was complete. In both, the difficulty was speedily removed by circumcision.

The common practice of exhibiting diuretics, or remedies calculated to increase the secretory action of the kidneys, in cases of *retention of the urine*, is always highly improper, as it cannot, in any way, aid in removing the obstruction, but must necessarily tend to aggravate the distress and danger, by rapidly increasing the fluid in the bladder.

When the inability to discharge urine, depends on *retention* of the secretion in the bladder, and the vesical distention and sufferings of the little patient are, as yet, not so great as to require prompt

relief, a trial may be made with the warm bath, purgatives, emolient enemata, and gentle frictions with camphorated oil, or tincture of hyosyamus, over the pubic region. Where the obstruction is slight, these measures will sometimes, remove the difficulty and bring on the urinary discharge. They should not, however, be long persisted in, if they do not procure some advantage before the symptoms become more urgent. The bougie and catheter are the proper means for giving relief; and the obstruction is but very rarely of such a character as to render the judicious employment of them necessarily abortive. The introduction of a small bougie will, sometimes, remove the obstruction and procure relief. But when the retention arises from a spasmodic constriction of the urethra, or sphincters of the bladder, or when the bladder has lost its power of contraction from over distention, the bougie can do little or no good, and recourse must be had to a proper sized flexible catheter. Great care and delicacy must be practised in the attempt to introduce such an instrument into the bladder of an infant. A very slight force will lacerate the urethra, and form an artificial passage into the cellular tissue of the perineum. I once knew a young surgeon, in attempting to introduce the catheter into the bladder of an infant, (male) push it through the membraneous portion of the urethra two or three inches before he discovered that the instrument was not in the natural passage. The child died. When the bladder has been greatly distended, and relieved by the catheter, its contractile power is apt to become temporarily impaired, so as to suffer the urine to re-accumulate to an extent sufficient to keep the infant in a state of constant uneasiness or distress, although a regular and apparently sufficiently copious discharge from the bladder takes place. Hence in instances of retention, where there has been great distention of the bladder, it often becomes necessary to use the catheter repeatedly, until the bladder regains sufficient power to evacuate itself, without artificial assistance. Sprinkling a little cold water on the lower part of the abdomen will sometimes excite the bladder into action in cases of this kind. The application of camphorated oil, by gentle friction over the pubic region, may also aid in restoring a proper tone to the muscular coat of the bladder.

When there is reason to believe that the retention depends on spasmodic constriction of the urethra, a drop of the muriated tincture of iron, given every twenty or thirty minutes, may be beneficial. In spasmodic retention of urine in adults, this article, sometimes affords speedy relief; and it would doubtless exert a similar beneficial effect in retention of the same character in infants. In all cases particular attention ought to be paid to the state of the bowels. The meconial matter should be completely evacuated, if the urinary difficulty occurs during the first few days after birth—and in all instances the bowels ought to be freely evacuated.

CHAPTER VIII.

OF DYSURIA—OR PAINFUL AND DIFFICULT MICTURITION.

Pain and difficulty in voiding urine is a frequent complaint among infants. It is particularly apt to occur during dentition, and sometimes acquires a very distressing degree of violence. The child may, in other respects appear perfectly well and playful, but the moment it begins to discharge urine, it becomes agitated with excruciating pains, and shrieks uninterruptedly and violently until the evacuation is completed, when it instantly becomes quiet and as well as usual. Not unfrequently this painful urinary affection goes on for many days, before its true character is detected—the vehement fits of screaming being usually ascribed to griping or transient colic pains. When an infant is observed to have occasional fits of violent shrieking and agitation, without any obvious cause, painful micturition may be suspected: and on proper enquiry it will, probably, be found that these spells of suffering, occur only when the infant is voiding urine—a coincidence which will, at once render the nature of the evil manifest. In many instances, however, the pain is much less severe. Instead of the occasional fits of excruciating suffering, the child manifests a very frequent desire to pass urine, which is voided in very small quantities and always with obvious distress and uneasiness. This difficulty sometimes continues for many months—particularly if the child be cutting teeth, and may ultimately lead to very distressing consequences.

These affections are almost always attended with an unnatural condition of the urinary secretion. In the majority of cases the urine contains a large portion of lithic acid; and occasionally it is highly charged with phosphatic sedimentous matter. These substances impart a peculiarly irritating quality to the urine;

and when they are copious, and the system is in an irritable condition, as it usually is during dentition, they may readily produce a considerable degree of irritation about the neck of the bladder, and give rise to pain and difficulty in passing urine. Children who are much affected with acidity in the primæ viæ, are most apt to experience urinary difficulties of this kind. The tendency of acid in the alimentary canal to increase the secretion of lithic acid by the kidneys is well known; and it is equally well ascertained that an excess of lithic matter in the urine, seldom fails to manifest itself by some irritation about the neck of the bladder, and more or less painful micturition.

Dentition, and a disordered state of the digestive functions constitute the principal remote causes of this form of urinary disease. The former by the general irritative condition of the system which it causes, strongly favors the development of the lithic acid diathesis; and, as has already been stated, the generation of acid in the alimentary canal, in consequence of feeble digestive powers, or the use of improper articles of food, appears to furnish the elementary materials, for the formation of lithic deposits in the urine. Intestinal irritation from worms, appears in some instances to give rise to painful and difficult micturition—though in cases of this kind the urinary deposits are usually of the alkaline variety. Ascarides frequently occasion considerable irritation about the neck of the bladder, and become the source of urinary difficulties.

Treatment. When a child becomes affected with pain and difficulty in passing urine, this secretion ought to be carefully examined, both in a recent state, and after it has stood for some time. If the sedimentous matter of the urine be of a red, or reddish color, remedies calculated to counteract the secretion of lithic acid by the kidneys will be indicated and will probably procure speedy relief. The proper treatment in such cases, consists in the employment of means suited to correct the digestive and intestinal functions, and to keep up a regular action of the cutaneous emunctories. The bowels should be freely evacuated with magnesia and rhubarb, and afterwards kept in a moderately loose state by the daily use of small doses of calomel and ipecacuanna.

A grain of the former, with a fourth of a grain of the latter, constitutes a proper dose for a child under five years of age. Where there is a prevailing tendency to acidity in the primæ viæ, much benefit may be obtained from the use of the sub-carbonate of potash, in union with a weak infusion of colomba. From two to three grains of the potash dissolved in a teaspoonful of weak infusion of colomba, diluted with a small portion of barley water, flaxseed tea, or some other mucilaginous fluid, may be given once, twice, or thrice daily, according to the urgency of the urinary affection. The diuretic and antilithic properties of the sub-carbonate of potash, renders it a peculiarly suitable medicine in cases of this kind. Small doses of magnesia, lime-water and milk, and the bi-carbonate of soda, also, frequently procure relief. When the general system is in a slightly febrile condition, as it often is during dentition, considerable advantage may be derived from tepid bathing, in conjunction with mild diaphoretic remedies; such as the *spirit. minderiri*, with the addition of a small portion of sweet spirits of nitre, and syrup of squills. Particular attention should be paid to the diet. When the tendency to the formation of acid in the primæ viæ is very great, beef or chicken tea should be in part substituted for the usual farinaceous nourishment, and all saccharine and acescent articles should be avoided.

When painful and difficult micturition is attended with a copious secretion of the phosphate of magnesia and ammonia—an occurrence by no means uncommon, a very different treatment is required. In cases of this kind, the urine is usually pale, rather abundant, depositing a whitish or yellowish white sediment, and peculiarly prone to become putrid when suffered to remain at rest. It is almost always attended with an irritable condition of the general system, and with obvious derangement of the digestive organs and irregularity in the action of the bowels. Aperients, mild tonics, opiates, and the vegetable acids, constitute the appropriate remedies in such cases. The bowels, in the first place, should be freely evacuated with rhubarb or caster oil.—Very small doses of Dover's powders, given two or three times daily, generally produce an excellent effect. A half a grain of this article, with a grain of powdered valerian, may be given every six hours, to a child between two and five years of age. The

occasional use of lemonade, or of water sweetened with lemon syrup, will sometimes assist very materially in correcting the urinary secretion. The diet should be of the mildest and most nutritious kind: considerable benefit may also be derived from the employment of muriated tincture of iron, in cases of this kind. I have known two drops of this tincture, given three times daily, to afford great relief in such a case. The diet should be mild and nutritious, and taken in very moderate quantities. Children who have passed through the period of primary dentition, may be allowed small portions of the tender and lean parts of beef, mutton, lamb, and chicken; but at an earlier age, the usual farinacious preparations, mixed with a little of beef or chicken tea, are undoubtedly the most proper. Magnesia and other articles of an alkaline character, are decidedly improper.

When pain and difficulty in voiding urine is not attended with a morbid condition of the urine either acid or alkaline, mucilaginous and slightly diuretic diluents, in conjunction with laxatives, and the occasional use of the warm bath, may be resorted to with a prospect of advantage. A weak infusion of the wild-carrot seed, or of parsley mixed with an equal portion of flax-seed or water-melon seed tea, will usually do well for this purpose.

In some instances, extremely painful micturition depends on an irritable or slightly inflamed state of the extremity or orifice of the urethra. This difficulty is almost wholly confined to female children. I have quite lately witnessed a case of this kind. The child (about two years old) suffered severe pain every time it passed urine. The affection had continued seven or eight days before the source of the urinary difficulty was discovered. The orifice of the urethra was slightly swollen, red, and so extremely sensible, that it could not be even lightly touched, without causing the child to shriek with pain. In cases of this kind, the pain and uneasiness usually continue for several minutes after the urine has ceased to pass off. The case just mentioned was speedily relieved by washing the inflamed and tender part with a strong solution of borax. The application of citrin ointment, weakened by mixing it with an equal portion of lard, seldom fails to reduce the inflammation in such cases. I have also used an infusion of galls, together with a watery solution of opium, with

an excellect effect in this variety of painful micturition. It should be applied with a dossil of lint. Merely covering the inflamed part with lard, or some mild ointment, will generally protect it from the painful impressions of the urine, and enable it to heal.

During dentition the urine sometimes becomes more or less deeply tinged with blood, without any difficulty or pain in voiding it. The appearance of blood in the urine, always excites considerable alarm; but where it is not attended with symptoms of irritation or inflammation in the urinary organs, it generally passes off without any unpleasant consequences. Small doses of the muriated tincture of iron, mild laxatives, and warm bathing, and mucilaginous drinks, seldom fail to remove it speedily.

It is of great consequence to attend to the urinary affections of infants, even though they may not appear to be of a serious character in their immediate effects. This is particularly true in relation to those instances of urinary difficulty that are attended with lithic acid, or phosphatic sediments. Dr. Prout observes, that "children in general, and especially the children of dyspeptic and gouty individuals, or who inherit a tendency to urinary diseases, are exceedingly liable to lithic acid deposits in the urine. If the urine be examined, it will always be found to be very unnatural, and frequently loaded with lithic acid; and should this prove to be the fact, the case requires immediate attention, as there is much greater risk, at this period of life, than at any other, of the formation of stone in the bladder." * In another place, this highly respectable writer states: every thing in our power ought to be done, "for preventing the effects of (lithic acid deposits in the urine) and eradicating the disease in early life; and perhaps, it may not be deemed superfluous, here, to insist upon the absolute necessity there is for attending to the subject, when children are concerned." In such cases, it should be constantly borne in mind, that by proper care, the formation of stone in the bladder, may almost certainly be prevented; but by inattention, this dreadful occurrence is as certainly likely to take place.

* Prout—Inquiry into the Nature and Treatment of Affections of the Urinary Organs. Chap. vi. s. ii.

CHAPTER IX.

OF ENURESIS, OR INCONTINENCE OF URINE.

Incontinence of urine—or rather a habit of discharging urine at night, while sleeping in bed, is a very common affection during childhood. Although very rarely attended with any particular uneasiness, or painful urinary irritation, it is always an extremely disagreeable occurrence, and the habit is apt to become so confirmed, that unless early counteracted by suitable measures, it often continues to the age of puberty, and occasionally, even to adult age. It is generally supposed that the discharge takes place involuntarily, without the least consciousness of its occurrence; and this is doubtless frequently the case. In the majority of instances, however, the discharge is a voluntary act—the result of an active effort of volition, under the fallacious conceptions of a dream. In children, this disagreeable affection is very often associated with an unnatural condition of the urinary secretion itself. In those cases, especially, where the discharge takes place in consequence of a voluntary effort excited by a lively dream, the urine, almost always contains an excess of sedimentous matter, particularly lithic acid, and its compounds, imparting to it an acrid and irritating character. "Hence," says Dr. Prout, "I have been led to infer, that in this species of urinary incontinence, the acrid properties of the urine are chiefly in fault; and that these, favored, perhaps, by the position of the body, and probably, also, by the morbid sensibility of the bladder, excite so vivid an impression on the imagination, as actually to lead to a voluntary effort to discharge the urine."

The urine is seldom discharged during sleep, except when the individual is lying on his back. Mr. Charles Bell affirms, that "incontinence of urine never takes place but while the boy is asleep upon his back." In this position the urine gravitates backwards, and presses immediately on the "sensible spot—the master-

spring of the muscles of the bladder, situated a little behind and below its orifice."

When children neglect to pass off the urine just before going to bed, the bladder is apt to become distended in the course of the night. The impressions thus made on the bladder, pass to the brain, and awaken a dream occupied with a desire to mictu rite, and the sphincter yields to the voluntary effort prompted by the desire.

That incontinence of urine is very frequently, perhaps always in the first instance, excited by an acrid condition of the urinary secretion, or by distention of the bladder, in the way just mentioned, admits of no doubt; yet in the majority of protracted cases, the recurrence of the discharge depends mainly on the influence of habit; and in many instances, this is doubtless the sole cause of its repetition.

Dr. Prout thinks that "some peculiar morbid condition of the urinary organs" constitutes the most frequent cause of those cases of nocturnal incontinence of urine, in which the discharge takes place involuntarily, and without any consciousness of its occurrence. Cases of this kind are almost always very obstinate in their course. They often continue for many years, and sometimes "even till late in life." It is by no means improbable, that this variety of incontinence sometimes depends on some obscure morbid state of the bladder; but it can scarcely be doubted, that in the majority of such cases, the recurrence of the involuntary urinary discharges, depends chiefly or entirely on the potent influence of habit. That the recurrence of the discharge in protracted cases, frequently depends solely upon habit, seems to be demonstrated by the character of the means, most commonly successful in arresting its continuance. We may often remove this evil by exciting a slight degree of irritation about the neck of the bladder; so that the moment the urine begins to flow, painful strangury occurs, by which the person is awakened, and the evacuation is prevented. By repeating this for some time, the habit is broken up, and the involuntary discharge ceases to recur.

I am entirely satisfied that this unpleasant complaint very generally *commences* in consequence of an unnatural condition of the

urine itself. When the urine becomes unusually irritating, its impressions on the bladder during sleep, when it becomes accumulated, are sufficiently strong to affect the sensorium commune in such a way as to excite a desire, and a consequent volition to micturate. It is not improbable that even in cases that are deemed strictly involuntary, and unperceived by the mind, the discharge takes place under an act of volition, which, however, is not remembered on waking. Persons who walk about while asleep, unquestionably exercise conscious volition, though wholly unable to recollect any thing about it when awake. Many things have been done during sleep, manifestly under the control of the will, and probably even under the guidance of the senses, of which not the slightest trace is left on the mind, in the waking state.

Treatment.—From what has been said above, it need scarcely be observed, that in prescribing for a case of this kind, particularly when of a recent character, the urine ought to be carefully inspected, as a preliminary step in the adoption of a suitable plan of management. Should the urine be found to contain much sedimentous matter, remedies ought to be employed for correcting the urinary secretion. If the lithic acid deposits predominate, small doses of magnesia, lime water, the sub-carbonate of potash, or of the bi-carbonate of soda, should be resorted to, in conjunction with laxatives and other means for improving the digestive and hepatic functions. In cases attended with phosphatic urinary deposits, remedies calculated to invigorate the digestive organs, together with opiates, vegetable acids, and acescent articles of nourishment will be proper. By such a course of management, recent cases may sometimes be completely arrested. But should the attempt to remove the evil, in this way, fail, it is always of much consequence to correct the urinary secretion, when it is found to be in an unnatural condition. "When the incontinence of urine in children is associated with gravel, or an excess of sedimentous matter, it is of the utmost consequence that this circumstance be attended to, and that remedies appropriate for counteracting the formation of these urinary deposits should be employed, before any other means are used to restrain the urinary incontinence;" for without this, all other remedies will be

useless (Prout). When the urine has been brought to a healthy or natural state, and the incontinence continues to recur; or in cases that seem to continue under the influence of an established habit, recourse must be had to remedies calculated to alter the sensibility of the urinary organs—more especially of the neck of the bladder. There is no article that has been so generally prescribed for this purpose, as the *tincture of cantharides;* and it is doubtless better adapted to produce this effect than any other remedy we possess. Its mode of operation in the case of this affection has already been explained above. By producing a slight degree of strangury, the person is awakened by the first efforts to urinate; and by thus repeatedly interrupting the discharge, the habit will finally be destroyed. From ten to fifteen drops, according to the age of the patient, should be given three times, in the course of twenty-four hours, and the dose daily increased by two or three drops, and continued until a burning pain is experienced at the neck of the bladder on passing urine. When this effect is produced, its use must be omitted, or continued in occasional doses, so as to keep up a slight degree of the urinary irritation. Should the strangury become too violent, suitable doses of laudanum must be given, at proper intervals, with emolient clysters—and the free use of mucilaginous diluents, such as flax-seed, or mellon-seed tea, barley-water, or a solution of gum arabic, and the warm hip-bath. Blisters applied over the sacrum, are sometimes equally beneficial.

Incontinence of urine in children sometimes depends on a morbidly irritable state of the bladder. The patient is during the day more or less harassed with a frequent desire to urinate, and the discharge is always accompanied with considerable uneasiness, and sometimes with much pain. These cases are usually associated with a morbid condition of the urine—sometimes with an excess of lithic acid, and occasionally with phosphatic deposits. Instances of this kind must be managed in the way stated above. The use of cantharides, or of other remedies calculated to irritate the neck of the bladder, would be highly improper in such cases. An irritable state of the bladder may, however, occur, without any morbid appearances in the urine, and give rise to urinary incontinence. Here, the remedies, proper for counteracting the secretion of the lithic acid, or phosphatic sediments would, probably,

prove injurious. In such cases recourse must be had to the warm bath—cooling laxatives, opiates, particularly Dover's powder, the application of a stimulating plaster over the sacrum, and a mild and digestible diet.

When incontinence of urine is attended with irritation of the rectum by ascarides, means should be used to remove these annoying little worms out of the bowels. I once attended a little girl who was for several months much troubled with uneasiness on passing water, and scarcely a night passed, without a discharge of urine during sleep. I at length learned that she was also greatly annoyed by ascarides. By the use of aloetic injections a large mass of them were brought away from the rectum, and the urinary difficulty and incontinence disappeared, for eight or nine months, when they returned, and were again removed by the same means.

Whatever means may be employed for the cure of nocturnal incontinence of urine, care should always be taken to accustom the patient to sleep upon his side or the belly. In this position the urine gravitates towards the fundus of the bladder, and does not rest upon the sensible spot, referred to above; and the patient is therefore not so apt "to be excited to dream of making urine, and to exert a voluntary effort, to urinate, as when he lies on his back." Children should always be required to empty the bladder just before going to bed, and when they awaken at night they ought to be taught to rise and pass off the urine. By a careful attention to these things, the occurrence of the disorder may generally be prevented.

CHAPTER X.

OF DENTITION.

The development and progress of the teeth through the gums, takes place in a very gradual manner. The germs of the teeth present themselves in the form of small follicles, containing a pulpy substance, attached to, or continuous with the fascicle of vessels and nerves which penetrate the cells or alveoli in which they are placed. The period at which these germs first make their appearance in the fœtal jaws has not been satisfactorily determined. It is sufficiently ascertained, however, that the first traces of ossification, very rarely occur previous to the fourth month; and it is equally uncommon to find the commencement of this process delayed beyond the middle of the fifth month. At birth, the development of the primary teeth is already considerably advanced. The whole crown is formed, but the root is still imperfect, consisting of a short and thick tubular projection, with very thin sides.

The number of these primary teeth is twenty—namely, four incisors or cutting teeth, two cuspid or eye teeth, and four grinding teeth in each jaw. Between the appearance of the first and the last of the primary or milk teeth, several years usually intervene. The first seldom protrude through the gums before the fourth month, and the last generally make their appearance about the end of the second year. The two middle cutting teeth of the lower jaw, are usually the first that make their appearance. In the course of three or four weeks afterwards, the corresponding incisors of the upper jaw protrude through the gums. These, in a few weeks more, are succeeded by the lateral cutting teeth of the lower jaw; and in a short time afterwards, the lateral incisors of the upper jaw also pierce the gums. In the course of

from about two to four months after the eight cutting teeth have made their appearance, the anterior grinders of the lower jaw "elevate their white surfaces above the gums," leaving vacant spaces between them and the two lateral incisors, for the cuspids or eye teeth. Soon afterwards, the corresponding grinders of the upper jaw also make their appearance. The cuspids or eye teeth next come out, those of the lower jaw preceding the upper ones. Finally, the second grinders pass through the gums, and terminate the process of primary dentition.

Although the general progress and order of dentition is such as has just been stated, yet great diversity occurs in different individuals, both in relation to the time at which the teeth protrude through the gums, and the order or succession of their appearance. In some instances, the first incisors appear as early as the second month, and in others, they do not make their appearance until the seventh or eighth month. The usual period of their appearance, however, is about the fifth or sixth month.—The irregularities, in this respect, are sometimes very great. Infants have been born with one or more well-formed teeth protruded. Van Swieten mentions cases of this kind, on the authority of Pliny, Marcellus Donatus, Colombo, &c.; and Haller and Voigtel refer to a great number of similar instances. I have myself seen an infant furnished with two well-shaped incisors, as early as the fourth week after birth. The instances of very tardy dentition are sometimes equally remarkable. I have a child now under my care, which has, as yet, not a single tooth, although upwards of eleven months old. Van Swieten mentions an instance, in which the first teeth did not make their appearance until the child was upwards of nineteen months old; and many cases of much greater delay in the appearance of the teeth, are recorded by Haller, Voigtel, and other writers.

With regard to the order in which the teeth are protruded, deviations from the ordinary course, as stated above, are by no means uncommon. In some instances, the two lateral cutting teeth of the lower jaw, make their appearance before the middle ones. Sometimes the incisors of the upper jaw precede those of the lower; and occasionally the eye teeth come out before the lateral cutting teeth. It is rare, however, to find the eye

teeth advanced through the gums before the first grinders, although, occasionally, this takes place. Instances are sometimes met with in which all the incisors pierce the gums almost simultaneously.

Although a process of physical development, and, therefore, strictly in accordance with the regular progress of nature, dentition is, nevertheless, almost invariably attended with more or less obvious deviation from a healthy condition of the system. The progress of the teeth through the gums is usually accompanied with a manifest increase of the general irritability of the system. The mouth is generally very hot, and the saliva secreted in great abundance. In many instances diarrhœa occurs; and in female infants, a slight mucous or leucorrhœal discharge from the vulva, is not uncommon. The infant evidently experiences an unpleasant tickling sensation in the gums, as may be inferred from the eagerness with which it bites upon hard substances, and the evident gratification it derives from having its gums firmly pressed and rubbed with the point of a finger. The sharp margin of the gums gradually expands and becomes flatter, and, in difficult cases, inflamed and swollen, as the teeth approach the surface. The infant manifests an irritable and fretful temper; slight exciting causes are apt to give rise to febrile irritation, and one or both cheeks are often flushed, more especially towards evening and after a full meal. When asleep, the child frequently starts as from sudden fright, and the expression of the countenance undergoes repeated changes.

The general and local disturbances accompanying dentition, are, however, often of so slight a character, as to require no attention, or to escape notice altogether. This is most apt to be the case in children whose constitutional habit is healthy, and who have been nourished with mild and appropriate food, and in whom the advance of the teeth through the gums is attended with a free secretion of saliva, and moderate loosness or diarrhœa. These evacuations are, in general, decidedly salutary. The free discharge of saliva has a direct tendency to relieve the irritable and congested capillaries of the gums and mouth, and to derive the blood from the brain, and moderate its irritative condition. The diarrhœa may prove beneficial, by "determining the circu-

lation from the head to the intestines, and particularly by its effects in lessening the quantity of blood in the system, and diminishing the strong action of the heart and arteries."

Even the most favorable instances, however, are attended with an increased susceptibility to the injurious influence of irritating or exciting causes; and hence all diseases, whatever may be their cause or origin, are apt to assume a more violent character during dentition than at other periods. There can be no doubt that many complaints, which at other periods would have terminated favorably, often acquire a fatal violence from that irritable and irritative condition of the system, which attends difficult dentition. From this circumstance, as well as from the direct tendency of dentition to originate violent affections, the period during which this process is going on, is justly regarded as one of the most perilous stages of life. It has been computed that one tenth, at least, of all the deaths which occur during childhood, may be fairly ascribed to dentition; and it does not appear to me that this is an exaggerated estimate.

When the gums become inflamed, swollen, and painful, and the secretion of saliva scanty, with torpor of the bowels, the whole organization, generally, sympathizes strongly with the local affection, and the nervous system especially is liable to great and dangerous irritation. Indeed, when from the influence of previous morbific causes, the system has become feeble, and unnaturally irritable, the most alarming consequences sometimes result from the irritation of the advancing teeth, before any signs of irritation and inflammation are discoverable in the gums.

Among the various circumstances which are apt to render dentition difficult and dangerous in its consequences, a deranged or dyspeptic state of the digestive organs, from errors in diet, is probably the most common and pernicious in its tendency. Children who are nursed exclusively at the breast, are, in general, much less apt to suffer inconvenience or disease, from dentition, than those who are either wholly, or in part, nourished with artificial food. When the digestive organs are habitually disordered, from the use of inappropriate articles of food, the risk of serious consequences from dentition is always very considerable. The general system, usually, becomes enfeebled and morbidly irritable,

by a continued course of improper nourishment; and in this condition the local irritation of the advancing teeth is not only peculiarly apt to give rise to general irritative affections, but by its reaction on the stomach and bowels, adds also greatly to the disordered state of these organs, and ultimately, often produces violent and highly dangerous affections. In robust and healthy children, the use of stimulating articles of nourishment and drink is calculated to do much injury, in this respect, independent of its tendency to derange the digestive organs, by increasing the phlogistic condition of the system, and promoting the occurrence of febrile and inflammatory affections, from the local irritation in the gums. A close and contaminated atmosphere, more especially when aided by high temperature, has a decided tendency to increase the difficulty and morbid consequences of dentition.—Children who reside in populous cities, or who are much confined to close and ill-ventilated apartments, are much more liable to unpleasant consequences from teething, than those who enjoy the pure and salubrious air of the country. The tendency of inactivity, impure air, and high atmospheric temperature, to increase the irritability of the system, and predispose it to the injurious influence of irritating causes, is well known. Dentition can seldom go on without giving rise to considerable disturbances in the system, where these causes are in full and continued operation during the process. The practice of keeping the heads of infants very warm, by flannel caps, or "sleeping on very soft pillows, which nearly envelop their heads," may do injury during dentition, by favoring the determination of blood to the head, and thereby increasing the liability to inflammatory irritation of the brain, &c.

The morbid, sympathetic effects of difficult dentition are very various. In robust, full, and otherwise healthy infants, the general disturbances, usually, consist in slight febrile irritation, particularly towards night, attended with a frequent, quick and sharp pulse; a very warm and somewhat dry skin, more or less costiveness, increased thirst, flushed cheeks, dull and heavy eyes, and a fretful and irritable temper. Cases of this kind are seldom accompanied with a copious secretion of saliva; on the contrary, the free discharge of this secretion, or the supervention of moderate diarrhœa,

almost invariably mitigates the general irritative condition, to a very obvious degree. In some instances, the brain sympathizes so strongly with the local affection, as to give rise to the usual phenomena of incipient arachnitis or acute dropsy of the head. In cases attended with this state of cerebral erethism, the child generally sleeps with its eyes half open, a circumscribed flush frequently appears on one or both cheeks, the eyes become slightly injected, and unusually sensible to light; the eye-brows are often contracted into a peculiar frown, accompanied with a discontented and anxious expression of the countenance; and the child is extremely fretful and irascible; when asleep, it often starts suddenly and screams out violently, or moans as if in pain; it is frequently observed to raise its hands and press them against the forehead; vomiting is apt to occur on rising suddenly from a recumbent to a sitting or erect posture, or after taking stimulating articles of nourishment; and the bowels are almost invariably in a disordered condition, being either torpid, or disturbed with griping, colic-pains and diarrhœa. The pulse is frequent, quick, and contracted—the temperature of the skin variable, the hands and feet being, at times, remarkably cool, whilst the head and body are preternaturally warm. Cases of this kind are always attended with considerable danger. When neglected or mismanaged, particularly in relation to the diet, they are apt to terminate in fatal oppression of the brain, from effusion into its cavities and upon its surface, or disorganization of its structure.

In some instances of difficult dentition, attended with an irritated condition of the brain, a remarkable swelling occurs on the hands and feet, which as the case advances, generally becomes associated with symptoms of alarming and frequently fatal nervous irritation. This swelling "has a considerable degree of roundness and elevation, and looks like that sort of tumor which might rise, on the same parts, from a blow or contusion. It seems to arise suddenly, as it has, generally, this roundness and elevation, from the time of its first attracting observation." When first observed it has somewhat of a mottled, lived, and purplish color, resembling the chilled hand of a full and healthy child after exposure to a cold and frosty atmosphere. It feels cold, at least it has no inflammatory heat and does not appear to be morbidly

sensible, or to give any pain to the child when handled. It does not pit on pressure, but rather gives the sensation of firmness and resistance. The swellings are confined to the anconal aspect of the metacarpus of the hands, and the rotular aspect of the metatarsus of the feet, terminating abruptly at the carpus and tarsus. The duration of these tumors is very various in different cases. Sometimes they disappear in three or four days—at others they continue for many weeks without either increase or diminution; and occasionally they disappear and return again, at short intervals for a number of weeks. In some cases these swellings pass off without any unpleasant or alarming consequences. More frequently, however, symptoms of a much more formidable nature ensue—consisting of a peculiar spasmodic affection commencing in the flexors of the hands and feet, and gradually extending itself until it terminates in general convulsions or tetanic spasms of the whole body. The reader is referred to the chapter "On Convulsions," in this work, where this very singular affection is fully described under the name of *Pedo-carpal Convulsions of Infants.**

The occurrence of convulsions from difficult dentition is very common. When they come on suddenly, and are attended with a full and flushed countenance, they are in general, much less dangerous, than when they are preceded, for some time, with symptoms of active cerebral irritation, and accompanied, with a pale and contracted aspect of the countenance. Cases of the former kind generally depend on simple irritation and vascular turgescence of the brain; whereas the latter are often connected with slow meningeal inflammation, effusion, or disorganization of some portion of the brain. When the child remains in a state of stupor or partial insensibility, with its eyes half open and turned up under the upper lids, for a considerable time after the paroxysm has subsided—and particularly when along with these symptoms, the respiration is very irregular with an occasional deep moaning sigh, and a very slow or extremely rapid and small pulse, the chances of a favorable termination are always extremely slender. When on the other hand the infant, soon after emer-

* Notes on the Swelling of the Tops of the Hands and Feet, &c. By Geo. Kellie, M. D. Edinburg Medical and Surgical Jour. vol. 12. p. 449.

ging from a fit, takes notice of surrounding objects, and breathes freely and regularly, without any particular manifestations of sensorial torpor and drowsiness, the probability of a favorable result, will be very considerable. Nothing tends more strongly to favor the occurrence of convulsions during dentition, than gastric or intestinal irritation, from the use of improper articles of nourishment, or from overloading the stomach. Children who are under the influence of difficult dentition, seldom enjoy a perfectly healthy state of the digestive organs, even under the most careful and judicious dietetic management. The stomach during this process, is often morbidly irritable, and hence errors in diet are much more apt to produce injurious consequences during this, than at any other period of life. So far as my own observations enable me to form an opinion, I am inclined to think that, the majority of instances of convulsions, usually ascribed to the sole irritation of dentition, are in fact excited by improper or immoderate alimentary ingesta. When the diarrhœa which frequently accompanies dentition is suddenly arrested by astringents, opiates &c. the liability to convulsions is always much increased, more especially in robust and plethoric infants. The same thing occurs, when from cold, or some other cause, the salivary secretion is suddenly checked or suspended, and the bowels remain costive. In general, convulsions are much more apt to occur during the eruption of the first grinders and eye-teeth, than while the incisors are making their way through the gums. This may arise, in part at least, from the circumstance that during the cutting of the incisors, children are as yet usually nourished exclusively at the breast; whilst during the latter stage of dentition, when the grinders and eye-teeth are advancing through the gums, they are generally weaned, and therefore much more exposed to gastro-intestinal irritation from improper articles of food.

Various eruptions on the skin are among the most common morbid consequences of difficult dentition. Of these, the *crusta lactea* is by far the most disagreeable and unmanageable. That this affection is intimately associated with dentition, is manifest from the fact, that it very rarely makes its appearance previous to the commencement of dentition, and never, I believe, after the process has been completed. Excoriations behind the ears, and

the various species of strophulus—particularly the strophulus confertus or tooth rash, are, also, very common during this period of infancy. The Strophuli are almost invariably accompanied with derangement of the digestive organs, and diarrhœa; but the two former affections, namely crusta lactea and excoriations about the ears are generally attended with a strong appetite and considerable torpor of the bowels.

Infants are also liable to a peculiar croupy affection during dentition, which is evidently of a spasmodic character, and dependent on cerebral irritation. In some instances, the singular swelling of the hands and feet mentioned above, becomes associated with occasional attacks of this croupy affection, about the time that the disease is assuming a distinctly spasmodic character. This form of croup, which has been aptly called "cerebral croup," is most apt to come on at night or early in the morning. It is attended with extremely difficult respiration and the hoarse and sonorous cough of ordinary croup. The attack is always very sudden, and generally of short duration, seldom continuing beyond fifteen or twenty minutes, and often not above a minute or two. I attended a child about three years ago, which, during the eruption of the eye teeth, was seized with an attack of spasmodic croup, almost every night, for six or seven weeks. As soon as the eruption of the eye-teeth was completed, the croupy affection ceased to recur. Under the head of croup, this singular malady is more circumstantially described. Slow and difficult dentition is sometimes attended with a very troublesome spasmodic or "nervous" cough, which comes on in sudden and violent paroxysms, at irregular and sometimes remote intervals. The breathing during the fit, is oppressed and suffocative; and the cough usually continues until the contents of the stomach are thrown off. At night the child is generally very restless, and the breathing peculiarly irregular, being now, extremely hurried and short, and then, slow, interrupted, sighing and moaning. In several remarkable cases of this kind—one of them in my own family,—the urinary secretion was unusually small, and frequently voided with evident pain. The cough generally continues to recur, until the teeth are all cut. I have never known it to continue after this process was completed. In many cases of spasmodic cough during diffi-

cult dentition, the principal irritation is evidently located in the stomach. In these instances, the epigastrium is distended, the stomach and bowels disordered and the alvine evacuations glairy and bilious. The fits of coughing are most apt to occur a short time after taking nourishment, and they usually continue until the greater part of what was received into the stomach, is thrown off by vomiting. There is seldom much saliva secreted in cases of this kind, and the tongue, generally, presents a bright red color along the edges and point, with a coat of thin white fur along its middle.

In some instances, of painful dentition, the urinary organs sympathize strongly with the local irritation in the gums. This is most apt to be the case, when the digestive powers are weak, and the primæ viæ habitually charged with acidity. The connection between habitual acidity in the stomach and bowels, and urinary difficulties, has already been pointed out in the chapter on "*Dysuria.*" The urine, in such cases is often loaded with an excess of lithic acid, or its compounds, and, on this account frequently so irritating, as to give rise to severe burning pain in the neck of the bladder and urethra on being voided. Occasionally, however, an opposite condition of the urine obtains. The urinary deposits are alkaline or earthy, and the urine is secreted in great abundance, assuming the character of diabetes insipidus. This latter condition of the urine, is seldom attended with any manifestations of febrile irritation; the hands and feet are usually cool, the system relaxed and languid, and the countenance pale and expressive of distress or suffering.

Fever, as has already been stated, is perhaps the most common sympathetic affection of difficult dentition. It seldom, however, assumes a vehement character, unless there are other sources of febrile irritation present. It is generally slow, irregular, changeable, intermitting or remitting—presenting the usual phenomena of chronic irritative fever, from slight local affections. The majority of instances of fever that occur during dentition, are excited, or at least greatly promoted by other causes. In that irritable state of the system, which usually attends the progress of the teeth through the gums, a slight accession of other sources of febrific irritation, will give rise to fever.

Management.—Throughout the whole course of dentition particular care should be taken to avoid every source of undue excitement or irritation. Even the most regular and mild cases are usually attended with an increased susceptibility to the influence of exciting or irritating causes. The stomach and bowels, especially, are apt to acquire an increased predisposition to the injurious operation of causes of this kind. Slight errors in diet are apt to disorder the digestive organs, during this period; and the occurrence of gastro-intestinal irritation is always peculiarly unfavorable to the easy progress of dentition. In all instances, therefore, the diet ought to be as simple and unirritating as possible. If the nurse furnishes a sufficient quantity of wholesome milk, nothing but this congenial nourishment ought to be allowed during the first period of dentition—that is until all the incisors at least, are protruded. Weaning should never be effected during the active progress of dentition. In general the most favorable period for weaning, is soon after all the incisors have made their appearance. Should it become necessary to resort to the use of artificial nourishment, in addition to that obtained at the breast, nothing can be more appropriate than the simple mixture of milk and water mentioned in the chapter "On the Nourishment of Infants." All solid articles of food ought to be rigidly avoided—more especially during the primary stage of dentition. After all the incisors have made their appearance, the child may occasionally take small portions of oatmeal gruel, crackers grated and dissolved in warm milk and water, barley water, and liquid preparations of arrow root, tapioca, or sago, provided the general and local irritation be not considerable. Moderation as to quantity also, is an important requisite to the proper dietetic management of infants during dentition. A full diet may do harm by increasing the general plethora and febrile tendency of the system, or by oppressing the digestive organs and giving rise to a disordered state of the stomach and bowels. The great objects to be kept in view, while dentition is going on, is to guard against every thing which may have a tendency to render the child feeble and morbidly irritable, or increase the fulness and inflammatory diathesis of the system.

Regular exercise by gestation in the open air, has an excellent

prophylactic tendency during dentition. When the weather is sufficiently mild and dry, the infant, if free from fever, ought to be daily exercised in the fresh and open air, by carrying, or riding it in a carriage. Inactivity and confinement to an impure and stagnant atmosphere are decidedly unfavorable to the easy and undisturbed progress of dentition. Children who enjoy suitable exercise, in the salubrious air of the country, almost always, pass through this period, with less inconvenience and danger than those who are confined to the contaminated atmosphere of populous cities. It is to be observed, however, that exercise is not recommended in cases attended with distinct fever, or with a decided tendency to secondary inflammations. It is to be regarded as a preventive measure—as a means for *avoiding* the occurrence of morbid irritability, and irritation, rather than for removing them when once developed. With this view, much benefit may unquestionably be derived from it. When aided by the influence of a salubrious air, it tends, in no small degree, to fortify the general powers of the system, and to prevent that feeble and irritable condition, which is so apt to occur during difficult dentition, and so favorable to the occurrence of alarming irritative affections.

Care should also be taken to avoid, as much as possible, every thing that may cause a preternatural determination of blood to the brain. The head ought to be kept cool. During warm weather, no caps should be worn; and at night, or when sleeping, the head should be suffered to remain uncovered. A very soft and large pillow of feathers, so as to cause it to lap round the infant's head, is particularly improper. The head must also be carefully secured from the direct rays of the sun when the child is carried out into the open air. A light straw hat, is decidedly the best covering for infants during the warm seasons. During cold weather caps, made of very thin materials may be worn within doors; and when the child is taken out, its head should be further protected against the cold, by a thin cloth cap, while the feet are kept as warm as possible by thick flannel stockings and shoes.

Costiveness must be obviated by enemata, and the occasional administration of a mild purgative. Much care is required, however, lest, in the anxiety to remedy this state of the bowels, a

more serious one be not substituted, by harsh and repeated purgations. I am certain that I have seen much harm done in this way. At no period of life, perhaps, are strong purges, so apt to give rise to intestinal irritation, as during the active progress of dentition. Habitual costiveness during dentition, is very generally attended with a deficient secretion of bile. The stools frequently present a whitish or clay-colored appearance and the urine is usually loaded with bilious matter. In cases of this kind, a small portion of calomel should be given every third or fourth evening and a moderate dose of castor oil or magnesia on the following morning. From one to two grains of calomel, will in general. suffice for this purpose. During the intermediate periods purgative enemata ought to be administered, so as to procure at least two free evacuations every twenty-four hours. Small doses of epsom salts dissolved in some bland and slightly mucilaginous fluid forms an excellent laxative in cases attended with febrile irritation. In the employment of calomel during dentition great care should be taken, that it be not carried to the extent of inflaming the gums, or producing a general mercurial action on the system. I have witnessed several highly distressing instances of extensive ulceration and sloughing of the gums and cheeks, in consequence of the incautious employment of calomel, while the system was under the influence of dentition.

If moderate diarrhœa occurs, it ought not to be checked or arrested, unless the child be in a very feeble condition from previous sickness. But even in this case, it should always be subdued in a gradual and gentle manner. Its tendency, as has already been stated, is in general, decidedly favorable, both by moderating the general febrile disposition of the system, and by counteracting the preternatural flow of blood to the head. When suddenly arrested by opiates or astringents, the local and general disturbances seldom fail to acquire a more severe and dangerous character. Convulsions, fever, and inflammatory affections of the brain, are among the evil consequences which are apt to result from the injudicious interference with the diarrhœal affection. In many instances, however, the diarrhœa assumes so violent a character, as to exhaust and disorder the system to a very dangerous extent. In cases of this kind, remedial assistance is indispensable. When-

ever the system is obviously debilitated and relaxed by this affection, measures should be adopted to moderate its violence. Unless the necessity of prompt and energetic measures be decidedly indicated, the excessive action of the bowels ought to be moderated in a gradual manner; and when the complaint can be reduced to a mild state, no attempt should be made to arrest its course wholly. Small doses of ipecacuanna, in combination with prepared chalk and minute portions of calomel, have, in general, succeeded better, in my hands, in cases of this kind, than any other remedy. A powder composed of a fourth of a grain of ipecacuanna, one sixth of a grain of calomel, and four or five grains of prepared chalk, should be given every three or four hours until the diarrhœa is sufficiently moderated. By continuing the exhibition of two or three doses daily, the complaint may generally be kept in a sufficiently moderate state, until the advancing teeth are protruded. I have rarely known a violent case of diarrhœa wholly arrested during the active progress of dentition, without an obvious increase of the general and local irritation. In cases of decidedly difficult dentition, attended with an irritated state of the nervous and vascular systems, it is generally extremely difficult to manage the diarrhœa without either suffering mischief from the exhausting effects of the bowel complaint, or aggravating the general and local irritative affections by giving it too great and sudden a check. A striking example of the correctness of this observation occurred to me not more than ten days ago. The infant was cutting the first molares, with considerable difficulty, though nothing of a dangerous character occurred except a diarrhœa, which in a short time became extremely violent and prostrating. I prescribed the above powders of ipecac, chalk and calomel, which had the effect of moderating the complaint considerably, though not to a sufficient extent. As this remedy did not seem to do any further good, I advised a decoction of the root of geranium maculatum in milk. This was given, and the bowel complaint was soon entirely arrested. In about ten hours after the complaint was thus stopped, a violent paroxysm of convulsions occurred, which terminated in a torpid or comatose condition; and although an active purgative and repeated enemata were administered, a second fit of convulsions ensued and terminated the life of the little sufferer.

The child's mouth ought to be washed out with fresh water every morning. This is always very grateful, and tends to moderate the uncomfortable heat and irritation of the mouth. The practice of putting some hard substance into the child's hands, to press and rub its gums with, is proper, and should never be neglected. A piece of smooth coral, ivory, orris root, or firm-grained wood may be used for this purpose. The substance ought to be smooth or polished, and of such a size and shape as to enable the child to hold it firmly with the hand, and prevent its slipping back into the fauces or throat. An ivory ring, about an inch and a quarter in diameter, is an excellent contrivance for this purpose. The ring may be suspended round the child's neck, so as to be always within its reach. This practice has been condemned by some writers, on account of its supposed tendency to harden the gums, just as the soles of the feet and palms of the hands are indurated by much walking and manual labor. This apprehension is, however, entirely unfounded. The tendency of compression and friction is rather to promote the absorption of the gums, than to consolidate and render them more resisting to the advancing teeth. Indeed the instinctive and apparently irresistible propensity which all children manifest to press and rub their gums firmly, upon every thing they lay hold of; and the very obvious relief and gratification which they derive from it, may be regarded as a sufficient warranty that the practice is not only harmless, but decidedly beneficial and desirable. Friction and pressure manifestly moderate the painful sensations of the gums; and they may do good, also, by promoting the free secretion of saliva, and thereby diminishing the heat and irritation of the mouth.

From time to time, the gums should, in all cases, be carefully inspected; and when found to be in an inflamed and swollen condition, they ought to be promptly and freely divided with a lancet, even though no unpleasant consequences be produced by the local irritation. When the gums are in this condition, a slight, additional exciting cause, will be apt to give rise to dangerous affections. An error in diet, an accidental derangement of the digestive organs, or a slight cold, may bring on an attack of convulsions, of fever, or of profuse and exhausting vomiting and purging. By a timely division of the inflamed and swollen portion of the

gums, the liability to consequences of this kind, will be much diminished. During the actual presence of these and other affections depending on difficult dentition, a division of the gums should, on no account, be neglected, if they are manifestly distended, or in a state of inflammatory irritation. The diseases of dentition appear to depend, mainly, on the distention of the membrane investing the crown of the teeth, and pressure upon the pulp, nerves and vessels at the bottom of the socket, in consequence of the resistance which the advancing teeth experience, from the tension and firmness of superincumbent gums. By dividing the gums, this pressure and distension is moderated, and if no other exciting cause be present, speedy and important relief will frequently ensue. Little or no advantage, however, can be expected from this operation, so long as the edge of the gums is sharp and wholly free from inflammation. It is not necessary, indeed, that there should be distinct swelling and inflammation present, to render this measure proper or useful. If the part over the advancing teeth is expanded, or thickened and tense, relief may be expected from the operation, although no decided marks of inflammation be present—in other words, if the teeth have approached near the surface, and unpleasant or alarming sympathetic affections occur, it will be proper to divide the gums freely. "Under every circumstance, of indisposition arising from dentition, the lancing of the gums ought never to be omitted. As soon as the gum is lanced, and the membrane is divided, the tooth obtains an increased room, the pressure is immediately taken off from the socket, and the cause of the irritation is removed" (Fox).

In reply to the objections that have been urged against the propriety and usefulness of this operation, I offer the following remarks from the writer just quoted. "It is very surprising, that notwithstanding the manifest advantage, which attends the lancing of the gums, in cases of painful dentition, there are persons who entertain strange prejudices against this safe and important source of relief. But the uniform experience of its good effects, and no instance of its doing harm ever having occurred, should produce an unanimous consent for adopting it. Some persons object to the operation, on account of the pain which it will occasion to the child, not considering that the inflammation produced by the re-

sistance of the gum to the tooth, is far more acute, than dividing the gum with a sharp instrument. Others suppose that the formation of the teeth is injured, and that they are more liable to decay; but neither of these circumstances can occur; for at the time the tooth is about to pass through, the enamel is completely formed, and no injury can be done to the formation of the fang, which is always continued for some time after the appearance of the crown."

"When it is necessary to lance the gums sometime before the teeth are quite ready to appear; they unite, and in this case the cicatrix has been said to impede the progress of the tooth, presenting a greater resistance than the gums, in their natural state; but it is now certainly known that a newly formed part, or cicatrix, always gives way sooner to the process of absorption than the surrounding parts, and hence the passage of the tooth is facilitated. The hemorrhage which is occasioned by the operation, is scarcely ever considerable, but is always beneficial: the vessels become unloaded, and the inflammation is always soon diminished."

Under an idea that the cicatrix may impede the protrusion of the tooth, some advise that the division of the gums should be made at the side near the edge, rather than directly over the crown of the advancing teeth. This, however, is not only unnecessary, but unfavorable to success. The incision should be made in the direction of the gums, and immediately over the crown of the teeth. A single incision will be sufficient for the incisors; but when the molares are near protruding, and the gum is swollen and tense, a crucial incision may be advantageous. Mere scarification can afford but little advantage. The gums must be freely divided, down to the teeth. The principal difficulty arises from the distension of the firm membrane stretched over the teeth; and unless this be divided along with the gums, the operation will fail to procure the full benefit which it is capable of affording.

When *convulsions* occur during dentition, the gums should be immediately divided if they exhibit any signs of inflammation or distension from the advancing teeth. Some writers recommend this operation in all instances of convulsions, while the process of teething is going on, whether marks of irritation or distension of the gum be present or not. "The advantages of this operation

are so great," says Underwood, "that whenever convulsions take place about the usual period of dentition, recourse ought always to be had to it, though by an examination of the gums there be no certain evidence of the convulsions being owing to such a cause. At any rate the operation can do no harm, even at any period; and should the shooting of teeth be only an aggravation of the true cause of the disease, lancing the gums must be attended with advantage." I am, however, convinced from experience, that cutting down through the gums, at so early a period, is always entirely useless; and I have known very troublesome and even alarming hemorrhage to occur from a deep incision, while the teeth were yet far from protruding, and the gum wholly free from the enlargement or distention which accompanies the advanced stage of dentition. It is not necessary, however, that there should be obvious inflammation and swelling present, to render this operation proper, or likely to afford benefit. Whenever, from the fulness of the gum, it appears that the tooth is near the surface, a free incision should undoubtedly be made, if convulsions or other alarming affections supervene. For a full account of the mode of managing convulsions from dentition, the reader is referred to the chapter "On Convulsions."

Should the child become affected with cutaneous diseases, while under the influence of dentition, the utmost caution ought to be observed, in the employment of external remedial applications. This is particularly important, in relation to discharging sores behind the ears, and scabby eruptions about the head. The application of astringent, drying, or repelling substances, may lead to the most violent and dangerous consequences. Indeed these affections, like the copious secretion of saliva, may have a favorable effect, by deriving the irritation and preternatural flow of blood, from the brain and other internal organs. If the external affection be suppressed, the sympathetic irritation will not be subdued, but only transferred to some other part of the system. If it falls on the brain, as it often does, convulsions, or meningitis (dropsy of the brain) may be the result; if on the lungs, severe pneumonic or cynancheal affections may be the consequence; and, if the stomach and bowels receive the introverted irritation, rapid and unmanageable diarrhœa or cholera, will probably ensue. This is no

imaginary view of the evil consequences that may result from an improper meddling with eruptive affections of a scabby or humid character, about the head, during dentition. I have witnessed some very striking examples of this kind, in the course of my practice. An instance occurred to me about eight months ago. During the active progress of dentition, a scabby and discharging eruption occurred on the cheeks, forehead, and behind the ears. I directed simple means, merely with the view of moderating the irritation and keeping the parts clean, and urged the impropriety of applying any thing calculated to dry up or remove the disease. The mother nevertheless, could not content herself with seeing the infant's face in so disagreeable a state, and, of her own accord, used astringent washes and other means, to remove the affection. In about a week after these applications were used, I was again called to prescribe for the child. The eruption was now almost entirely removed; the little patient was feverish and extremely restless and fretful. Suitable remedies were resorted to, but in opposition to all my efforts, the disease rapidly increased, and terminated in fatal coma, paralysis, and convulsions. See the chapters on "*Crustea Lactea*" and on "*Sore Ears*," for further directions on this subject.

The application of blisters behind the ears, or on the back of the neck, is often of essential service in the diseases that arise from difficult dentition. When symptoms of cerebral irritation supervene—such as great fretfulness, flushing of the cheeks, a warm and dry skin, starting and restlessness during sleep, and unusual sensibility of the eyes to the light, the timely application of blisters behind the ears, or on the back of the neck, may prevent the development of inflammation in the brain or its meninges, or obviate an attack of dangerous diarrhœa, convulsions, &c. &c. In violent and obstinate diarrhœa, from dentition, I have often derived unequivocal advantage from this practice. Whatever is calculated to diminish cerebral irritation, or to lessen the determination of blood to the brain, may be usefully applied, in the sympathetic diseases of dentition; for, with the exception of eruptive affections, they are almost always dependent on, or at least connected with and aggravated by, cerebral irritation. In the sudden convulsive affections, which are so apt to occur during dentition,

immersing the feet and legs in warm water, and applying a cloth soaked with cold water to the head, is, in general, more certain and prompt in procuring relief than any other remedy we possess. The simultaneous application of cold to the head and warmth to the feet, has a powerful tendency to diminish sanguineous congestion and inordinate excitement in the brain. These two applications should always go together when the brain is in an irritated and congested condition. The propriety of keeping the bowels in a loose state during dentition, has already been mentioned. When violent affections supervene, or when there are indications of the approach of serious sympathetic disorders from dentition, and diarrhœa does not attend, great benefit may frequently be obtained, from active purgatives. By stimulating the bowels in this way, and directing the circulation and excitement upon them, the brain will be relieved, and the diseases depending on its irritated condition either prevented or mitigated.

When the gums become ulcerated, before the teeth are protruded, they should be lanced, and touched occasionally with a solution of sulphate of copper, or of the nitrate of silver. Four grains of either of these articles, dissolved in an ounce of water, and applied with a dossil of lint, forms an excellent application in cases of this kind. A decoction of the root of *coptis trifoliata*, (golden thread), has frequently done much good in my hands, in ulcerated gums.

CHAPTER XI.

OF THE DIABETES OF INFANTS.

Diabetes is, probably, a much more frequent disease during infancy than is generally supposed. Since it was first noticed by Moreton, in his Phthisiologia, it has received but little attention, from writers on the diseases of children. Mr. Venables, however, in his recent work on diabetes, has contributed some interesting and valuable information on the diabetic affections of children; and it is from this source, principally, that the following observations are drawn.

Infantile diabetes seldom occurs after the second year of age. Dr. Dewees states that "all the children he has seen affected with it, were under fifteen months old." It does not, however, seem apt to come on during lactation; for, according to the observations of Mr. Venables, its appearance previous to weaning is extremely uncommon.

In the commencement of the disease, the child loses its usual playful and active disposition, and, although no obvious malady be discernible, it soon becomes dull, languid and fretful, with an uneasy and anxious expression of the countenance. In a short time, its flesh begins to waste; and as the emaciation gradually increases, the skin becomes dry, harsh, and so flabby, that "it seems, at length to hang loosely about the body." During the early stage of the disease, "the bowels are regular, and little or no deviation from the natural and healthy appearance of the alvine discharges is to be noticed." The tongue, too, exhibits a natural appearance, in the beginning, but in the advanced stage of the disease, it always becomes more or less conspicuously covered with a coat of white fur, or thick transparent mucus. After the disease has made considerable progress, the bowels begin to act irregularly, and the alvine discharges acquire an unnatural, and, generally, bilious appearance. The skin becomes uniformly dry and very

warm; and emaciation goes on with increasing rapidity. The pulse is at first somewhat accelerated, becoming small, quick, hard and wiry, as the disease advances in its course. The abdomen, gradually becomes more and more distended, and tense,—a symptom which in connection with the progressive emaciation, "frequently leads to the supposition of mesenteric disease." In the advanced stage of the complaint, the brain generally becomes more or less affected. "Headach, vertigo, and temporary delirium occasionally attend, and when a fatal termination takes place, the patient usually dies comatose and sometimes apoplectic." A considerable degree of fever, generally prevails during the latter periods of the disease; and in cases of long continuance, anasarca, and even general dropsy have been known to occur. "The most remarkable occurrence, however, although it frequently escapes observation, is the inordinate discharge of urine. This discharge increases in quantity so gradually, that it is not usually noticed. By the time it has become more remarkable, great thirst prevails, and hence it is neglected or unnoticed, because parents and friends conceive an excessive discharge of urine and an excessive consumption of fluid as naturally associated." The qualities of the urine vary in different cases. In some instances the urine is perfectly limpid, without any sedimentous matter, or deposit; in others "it is milky, or like a mixture of chalk and water." Occasionally the urine is transparent, and "of a pale straw color;" and Mr. Venables saw a case in which it was of a green color. It appears, frequently, to contain a considerable portion of coagulable serum; and when the proportion of the coagulable matter is great, and the urinary discharge very copious, "the emaciation is always rapid and extensive."* Mr. Venables does not mention the occurrence of a saccharine condition of the urine, in infantile diabetes. In the case related by Moreton, the urine was very perceptibly sweet: I have myself witnessed three very distinctly formed cases of infantile diabetes, in all of which, the urine, though extremely copious, was perfectly insipid.

There is reason to believe, as is observed by Mr. Venables, that

* A Practical Treatise on Diabetes; with Observations on the *tabes diuretica*, or Urinary Consumption, especially as it occurs in Children, &c. By R. Venables, M. B. &c. p. 5–16.

many cases that have been regarded as instances of dropsy in the head, marasmus, and mesenteric disease, were in reality cases of diabetes. I am the more persuaded of the correctness of this observation from the error which I committed myself, in this respect, in the first case of this kind I witnessed. The child appeared to me to be laboring under mesenteric disease, and after having treated the case as such, for three or four weeks, the mother casually observed, that the little patient passed a great deal of urine. I now directed my attention to this circumstance, and soon satisfied myself that the quantity of urine discharged was truly excessive. In the course of twenty-four hours, three pints of urine were collected, and much was discharged at night, as well as during the day, that could not be collected. The urine was clear, and of a pale straw color, but I neglected to ascertain whether it contained any coagulable matter. The infant was but fifteen months old. Infantile diabetes is, indeed, very rarely recognized, in its incipient, or early stage; "and when it has made considerable progress, it simulates so many other diseases, that the real character of the complaint is not developed till its history is either wholly lost, or so confounded with symptomatic or secondary affections, that it can no longer be unravelled." Too little attention is, in general, paid to the urinary secretion, in the diseases of children. In maladies of a protracted character, attended with emaciation, and a general irritative condition, the urine ought always to be carefully inspected. There can be no doubt that serious derangements of this secretion often occur in children, without being suspected. I was quite recently called into consultation, in the case of a child about eighteen months old. It appeared languid, and was much emaciated; its bowels were irregular, the stools slimy and mixed with green bile, and it was evidently harassed with constant thirst. In this case the urinary secretion, on proper inquiry, was found to be preternaturally copious. It could not indeed be regarded as an instance of diabetes; but the quantity of the discharge was such, that it could not fail to contribute materially to the exhaustion and emaciation of the little patient, and manifestly required particular attention in the remedial management of the case. The urine in this patient contained a considerable portion of sedimentous matter of the phosphatic variety. From what I have obser-

ved in relation to the urinary affections of children, I am induced to think, that infantile diabetes is frequently attended with an excess of the earthy phosphates in the urine. This state of the urinary secretion, says Prout, "frequently occurs in sickly children, in whom the functions of the digestive organs are deranged;" and it is well known, that where this condition of the urine prevails, "symptoms very analogous to those of diabetes are apt to supervene." From the connection which is known to exist between an *excess of urea* in the urine, and the symptoms usually denominated *diabetes insipidus*, in adults, there can be no doubt that a similar state of the urine is sometimes present in the diabetic affections of infants. This disease may, moreover, be associated with an albuminous or coagulable condition of the urine, since this state of the secretion is sometimes attended with profuse diuresis, at a more advanced age. These circumstances are worthy of notice; and when properly estimated, may aid considerably in instituting a proper course of treatment; for it cannot be doubted that these different conditions of the urine require corresponding modifications of remedial management.

Treatment. In the treatment of this affection, much will of course depend, on the character of the urinary secretion. In cases attended with a saccharine state of the urine, recourse must be had to those means which experience has ascertained to be most beneficial in diabetis mellitus. Instead of the usual farinaceous or milk diet, the nourishment should consist principally of the lighter and more digestible kinds of animal food. If febrile symptoms attend, it may be beneficial to apply six or seven leeches to the lumbar regions. Mild aperients, and the occasional use of the warm bath, will be proper. Opiates are often decidedly beneficial in this affection—more especially in the form of Dover's powder. To a child between one and two years old, a grain of this anodyne mixture, with, or without three or four grains of powdered uva ursi may be given two or three times daily. In the diabetes of adults, Mr. Latham used opium and the carbonate of iron with decided advantage; Mr. Venable speaks very favorably of the effects of phosphate of iron, in this complaint. *Magnesia*, given in small and repeated doses, has proved

serviceable; and Richter mentions a case of diabetes, in a child, which yielded to a course of emetics.

It is but very rarely, however, that the urine is sweet in the diabetic affections of infants. In the ordinary forms of the disease, mild laxatives, in alternation with Dover's powders and uva ursi, will often procure relief. Small doses of the bi-carbonate of soda, in union with two or three grains of the carbonate of iron, may be resorted to with a prospect of advantage. When the urine deposits a whitish sediment, hyoscyamus, or laudanum, with uva ursi will sometimes prove beneficial. In one of the cases referred to above, I prescribed a solution of the extract of hyoscyamus, in the proportion of one scruple to an ounce of water, in conjunction with infusion of uva ursi, with manifest advantage. Five drops of the narcotic solution, with a teaspoonful of the uva ursi tea, were given three times daily. Dr. Dewees cured several cases by "keeping the bowels freely open, and putting a quantity of the spirits of turpentine upon the clothes of the chidren, so as to keep them in a terebinthinate atmosphere. I have seen much good done in a case of this disease, by a turpentine plaster laid over the region of the kidneys. When the disease has advanced so far as to be attended with much intestinal disorder, and a tumid and tense state of the abdomen, considerable benefit would probably be derived from the internal use of small doses of balsam copaiva, or spirits of turpentine, with an occasional mercurial laxative. In this aggravated state of the disease the diet should consist of the simplest and blandest farinaceous preparations. Where the digestive powers are good, and there are no manifestations of intestinal irritation, beaf tea or weak chicken broth, mixed with the usual farinaceous nourishment, or a portion of milk, will generally prove most beneficial. The gums should always be attended to, and if they are swollen and the teeth are near protruding, they ought to be divided or scarified with a lancet. When the child is fretful, and evidently harassed by painful sensations about the head and gums, small blisters laid behind the ears will sometimes procure much relief, and aid materially in removing the diabetic affection. In every variety of this disease, it is of much consequence to promote the action of the cutaneous emunctories. The warm bath, and frictions with

dry flannel, repeated at proper intervals, are very suitable remedies for this purpose.

CHAPTER XII.

OF THE ERYSIPELAS OF INFANTS.

Infants are liable to a peculiar erysipelatous inflammation, of a very obstinate and dangerous character. It usually comes on within a few days after birth, and occurs but very rarely after the fourth or fifth week. Dr. Dewees mentions two cases, which came on at a much later period—one after the third and the other after the sixth month. I have witnessed but one instance of its occurrence after the eighth week, and not more than three after the third week. Richter states that children have been born with blotches of erysipelatous inflammation so far advanced as to exhibit vesications and spots of gangrene. I saw a fatal case, about ten years ago, which had come on within five or six hours after birth.

The inflammation generally commences, on the lower parts of the body, particularly about the nates, groins, and umbilicus, in the form of a small red blotch, and gradually spreads, irregularly, over the abdomen and along the back and inside of the thighs. The inflamed part is firm and extremely painful to the touch, presenting a swollen, dark-red or purplish surface of irregular shape. Generally, towards the end of the first day, large but thinly scattered vesicles appear, having inflamed livid bases, tending sometimes rapidly to sphacelus. In some instances vesication does not occur until the disease has continued for several days; in others, the vesicles make their appearance, soon after the inflammation is established. Occasionally no vesication occurs throughout the whole course of the inflammation. When the inflamed part vesicates early, the disease generally spreads very

rapidly and soon acquires an extremely dangerous condition. The tendency to gangrene in infantile erysipelas is, indeed always very considerable, except, perhaps, in those mild cases, which remain free from blistering—a form of the disease, however, which is unfortunately, not often met with. The disposition to sphacelus is particularly great, when the inflammation is seated on the abdomen; when it affects the extremities, it is more apt to terminate in ulcerative suppuration of the subcutaneous cellular structure, but this occurs also, frequently, on the body, particularly about the nates and loins. The pus formed is generally very thin, of a greyish color, and frequently somewhat acrid and sanious. It travels along through the meshes of the cellular membrane, under the skin and between the muscles, until this tissue (the cellular) is almost entirely destroyed in the affected part. Small portions of the skin, finally slough off, and give exit to the confined matter, which is, usually, mixed with flocculi and shreds of sphacellated cellular membrane. Symptoms of intestinal and hepatic disorder, are seldom wholly absent in infantile erysipelas.

The discharges from the bowels are usually frequent, griping and of a grass-green color. In some cases, however, there is constipation, with colicky affections, and frequent ejections of acid fluid from the stomach. The whole surface of the body, often presents a slightly jaundiced appearance, and the urine is usually manifestly imbued with bilious matter.

Great diversity occurs, in relation to the violence and duration of this malady. In some instances, the inflammation passes off, in two or three days, without any very unfavorable consequences. Cases of this mild character are however very rare. Sometimes, although the inflammation is not extensive, it successively invades almost every part of the body. In its erratic passage over the surface of the body, it sometimes travels on by a continuous extension in one direction while the parts previously affected are freed from the inflammation. Occasionally, however, it leaps as it were, from one place to another, disappearing from the part it occupies, and reappearing speedily in some other and perhaps remote part of the body. In some instances the skin surrounding the inflammation, to the distance of nearly an inch from its mar-

gin, is peculiarly firm to the touch, and cannot be pinched up or moved over the subjacent parts, as may be done in a healthy state of the body.

Meckel, in examining the body of an infant that had died of this disease, found the umbilical vein, together with a considerable extent of the surrounding peritoneum strongly inflamed; and this fact, led him to believe, that inflammation of this vein, occasioned by rude management, in cutting and tying the umbilical cord, constituted the primary cause of this malady. Osiander gives an account of a fatal case, which commenced in the genitals of a male infant soon after birth. The inflammation spread itself rapidly over the whole abdomen. On dissection, he found the umbilical vein full of thick yellow pus, from the navel to the vena-porta, with other traces of inflammation in the adjacent parts. Inflammation of the umbilical vein, might, perhaps, account for the occurrence of erysipelas in the parts surrounding the navel; but even where the umbilical vein is found to be inflamed on post mortem examination, the correctness of this pathology must be very doubtful, since it is impossible to say, whether, the inflammation of the vein was primary, or the result simply of an extension of the erysipelas, from the external surface along the vein. Nevertheless, the fact, that in a very large majority of instances, the disease comes on either before or soon after the extremity of the cord is cast from the navel, leaving this part in a tender and irritable condition, together with the circumstance that the erysipelas almost always makes its first appearance on the lower parts of the body, seems to favor the idea, that this dangerous affection is frequently in some way or other connected with umbilical irritation. In some peculiar states of the system, the slightest injury of the skin is apt to give rise to erysipelatous inflammation in adults; and it is not improbable, that a similar predisposition, in co-operation with irritation about the umbilicus may be a common source of infantile erysipelas. It may be said that as this disease sometimes occurs long after all irritation about the umbilicus has passed off, this mode of accounting for its occurrence cannot be correct. It certainly cannot be presumed, that all, or perhaps even a majority of the cases are produced in this way; yet it is by no means improbable, that in some instances, at

least, irritation about the navel, in conjunction with a peculiarly depraved or irritable condition of the system, constitutes the exciting cause of the disease. It is worthy of notice, that in those cases which occur at an advanced period, after the navel has acquired a perfectly firm and healthy condition, the inflammation almost always occurs on the extremities or about the head and shoulders. Irritation and functional disorder of the liver and alimentary canal has also been referred to as the primary source of infantile erysipelas. There can be no doubt, that derangement of the biliary and digestive functions frequently co-operate with other causes in the production of this malady. Symptoms of functional disorder of the liver, and digestive organs, are seldom wholly absent in this affection, and require especial attention in prescribing for its cure. We can, however, hardly ascribe much influence to hepatic and intestinal derangements as exciting causes of this affection, since functional disorders of the digestive and biliary organs are very common throughout the whole period of infancy, whilst infantile erysipelas occurs but seldom, and is, in a great measure, confined to the first three or four weeks after birth. This latter circumstance justifies the presumption, that there is something peculiar to this early stage of infancy, to which the principal agency in the causation of this malady must belong. The disordered state of the biliary and intestinal functions, is perhaps, in many instances, an effect rather than a cause of the morbid condition upon which the erysipelatous affection depends. Its unfavorable influence on the disease, however, cannot be doubted, and a principal part of the remedial treatment consists in restoring the healthy action of the liver and alimentary canal. Breathing an impure atmosphere, has a very decided tendency to favor the occurrence of this disease. It is on this account, that the disease is so much more apt to occur in lying-in, and foundling hospitals, than in private habitations. Dr. Underwood says, that he rarely met with infantile erysipelas in private practice, but repeatedly in lying-in Institutions. It has, indeed, often prevailed endemically, in crowded and ill-ventilated hospitals.

It does not appear that infantile erysipelas differs in any essential point from the erysipelas of adults. It occurs under all the modifications, as to its phenomena and progress, that it is known

to assume at a more advanced age. In some instances, though very rarely, it continues for fourteen or fifteen days, with but little vesication, and no cellular suppuration. In general, however, vesicles appear very early; and in such cases, the tendency to suppuration and gangrene, is usually very great. In the majority of instances, the cellular tissue about the inflamed part becomes much infiltrated with serum. When deep incisions are made into the affected parts after death, a large portion of thin fluid issues, and the skin exhibits a firmer and thicker structure than in the natural state. In the commencement, the febrile reaction is sometimes of a high inflammatory grade; but when vesication begins, it often speedily assumes a low and typhoid character, and in many cases, the tendency to sinking is manifest as soon as the inflammation is established. The approach of suppuration is always attended with an obvious failure of the vital energies; and the instances of recovery after this has taken place are extremely uncommon.

Treatment.—Though, in the commencement, often associated with an active grade of febrile excitement, infantile erysipelas rarely admits of very decisive antiphlogistic measures. An obvious tendency to prostration often occurs almost as soon as the inflammation makes its appearance, the fever being of a typhoid character from the onset of the malady. Occasionally, however, the fever is of a high or synochal grade, and in cases of this kind direct depletion may be resorted to with much propriety. I have met with but one instance in which it appeared to me, decidedly proper to abstract blood. The infant was unusually robust; and the pulse and general appearance of the little patient, indicated a high degree of febrile reaction. The inflammation occupied the upper part of the right thigh, groin and illiac region, and had not vesicated at the end of the third day. After the use of some purgatives, I directed four leeches to be applied around the inflamed part, and the result was unquivocally beneficial. If leeches can be procured, they ought always to be used, in preference to venesection, at this early stage of infancy. It is proper to observe, that, when leeching is resorted to in this affection, the leeches should always be applied to the sound skin, surrounding the inflammation. Leeching is most apt to prove

beneficial, where the erysipelatous inflammation is of an erythematous character—that is, superficial, with but little swelling and infiltration of the subjacent cellular tissue. "A trifling abstraction of blood, will be sufficient to effect every useful purpose, where this measure is indicated." It will very seldom be proper, to apply more than four leeches of the ordinary size; and, in the majority of such instances, two or three leeches will be quite sufficient. When the inflammation spreads rapidly, and is attended with vesication, the leeches should be applied to some remote part, as a general depletory measure, if the condition of the system indicates the propriety of bleeding. I am not disposed, however, to urge the employment of bleeding, whether general or topical, in infantile erysipelas, for although it may doubtless do good in some cases, yet I am entirely satisfied, that an active antiphlogistic treatment is attended with much risk of irremediable injury, even in cases that seem to warrant its adoption.

The milder antiphlogistic means--more especially laxatives, and diaphoretics are almost always decidedly indicated in the early stage of the disease. From the constant and intimate sympathy which subsists between the skin, and the mucous membrane of the alimentary canal, there can be no doubt, that intestinal irritation from acrid fœculent matter and morbid secretions must tend to support and aggravate the external erysipelatous inflammation. One of the first remedial measures, therefore, should be to evacuate the bowels freely. For this purpose, a grain of calomel, followed some hours after, by a teaspoonful of castor oil, generally answers very well. If difficulty occurs in procuring free evacuations, laxative enemata should be resorted to in conjunction with the use of internal purgatives. After the bowels have in the first place been well evacuated, they should be kept in a loose state, by small doses of calomel in combination with rhubarb, or with ipecacuanna. A mixture of calomel, ipecacuanna, and bi-carbonate of soda forms a most excellent aperient in this disease. A powder consisting of a fourth of a grain of calomel, the same quantity of ipecacuanna and one grain of the bicarbonate of soda, rubbed up with a few grains of white sugar, should be given every three or four hours, or at longer intervals, so as to procure three or four alvine discharges in the course of

about twenty-four hours. The ipecacuanna promotes the laxative operation of the calomel, and tends to keep up the action of the cutaneous exhalents, whilst the soda counteracts the formation of acid in the primæ viæ. Mr. Lawrence, recommends the use of a mixture of James's powder and calomel, and there can be no doubt of its being very well adapted for this purpose. One sixth of a grain of the former with a fourth of a grain of the latter may be given three or four times daily. Calomel can seldom be omitted with propriety in the treatment of the early stage of infantile erysipelas. The liver is, probably, always more or less disordered in this disease; and calomel is doubtless often beneficial, by its operation on the biliary organs, independent of its aperient effects on the bowels. The stools, generally, present a grass-green appearance; and I have seen an instance in which they were black and viscid, like meconial matter, for several days. It is necessary, however, to proceed with caution in the use of calomel at this early period of infancy. When given very freely, it is apt, at this tender age, to give rise to dangerous irritation of the stomach and intestinal canal. Throughout the whole course of infantile erysipelas our principal aim should be to restore the regular action of the liver, alimentary canal and of the skin. Should the small doses of calomel and ipecacuanna fail to keep up the requisite action of the bowels, an occasional dose of castor oil, or of magnesia, should be used; and to promote the regular action of the cutaneous exhalents, warm or tepid bathing may be resorted to with a prospect of advantage. In the erysipelas of adults, attended with symptoms of biliary derangement, Desault, strongly recommends the use of *emetics*, and from a case which came under my notice, about eight years ago, in an infant nearly four weeks old, I am inclined to think, that the occasional use of *emetic* doses of ipecacuanna, would often prove serviceable in the early stage of infantile erysipelas. In the child referred to, pretty active vomiting was unintentionally excited by a dose of calomel and ipecacuanna on the third day of the disease; and the erysipelatous affection almost immediately assumed a more favorable appearance. When the skin is very dry and warm, some benefit may be derived from the use of mild diaphoretics. From fifteen

to thirty drops of the following mixture* will usually answer very well for this purpose.

Where the tendency to visication and gangrene, is obvious, or where the attending fever is of a low and typhoid character, tonics must be employed at the same time that the bowels are kept in a loose state by the aperients already mentioned. The necessity of resorting to the use of tonics, is especially urgent, when the inflammation is about terminating, or has already terminated in suppuration or gangrene. Experience has shown that the *sulphate of quinine* is decidedly the most valuable tonic we possess in cases of this kind. To an infant within the first month the sixth of a grain of this article, may be given every two or three hours. It may be advantageously united with a suitable portion of the extract of hyoscyamus—a combination which I have found peculiarly beneficial in the typhoid erysipelas of adults. The tenth of a grain of this extract may be given to an infant, two or three times daily. Should diarrhœa occur after suppuration has taken place, it must be immediately checked. For this purpose minute doses of Dover's powder, in union with prepared chalk, is probably the most suitable remedy. The fourth of a grain of Dover's powder, with two or three grains of chalk, mixed with mucilage of gum arabic, should be given every three or four hours until the bowels are quiescent. One or two drops of laudanum, also, given at proper intervals, will often suffice for this purpose. To support the system, where there is a tendency to prostration, some writers speak very favorably of the employment of the carbonate of ammonia. I have used it in conjunction with quinine, with manifest advantage in a case of infantile erysipelas. Ammonia may in general be given earlier, without risk of increasing the inflammation, in cases attended with considerable fever, than quinine. When the circumstances are such as to render it doubtful whether stimuli and tonics should be employed or not, the carbonate of ammonia ought to be selected, if it be concluded to resort to such remedies. The diaphoretic tendency of this article, renders it more eligible in diseases of a typhoid character, attended with local inflammation, than, perhaps, any other article of the kind

* ℞. Spirit Minderiri ℥i. Vin. Antimonii, gtt. xxv. Syrup Lemonis ℥ii. M. ft.

we possess—more especially where the propriety of such remedies may be doubtful. One of my medical friends has informed that, he had in two instances of infantile erysipelas derived unquestionable benefit from the internal use of *spirits of turpentine*. He gave three drops of it, every four hours, to an infant about six weeks old. In the erysipelas of adults I have in several instances, prescribed the turpentine, and, as it appeared to me, with a very good effect.

Various opinions have been expressed with regard to the propriety or usefulness of attempting to subdue or restrain the erysipelatous inflammation by local applications. Bateman asserts, that external applications, "are in general unnecessary if not prejudicial," in the early stages of the disease; and the same remark is made by some other writers of respectability. The weight of good testimony, however, is decidedly in favor of external applications to the affected part; and my own experience has convinced me, that very important advantages may often be obtained from a judicious management of this class of remedies. Cooling applications, such as cold water—lead-water and other soothing means, were formerly much resorted to in the treatment of erysipelas. Experience however, has not sustained the character of such applications as in general suitable remedies in this variety of inflammation. There evidently exists a close analogy between erysipelatous inflammation, and the inflammation caused by a scald or burn. In both, the inflamed capillaries appear to be in a debilitated and passively distended condition, requiring applications of an exciting character. In the erysipelas of adults, *blisters* often produce highly beneficial effects, and by proper management they may doubtless be used with equal advantage in the erysipelas of infants. Dr. Dewees, seems to place considerable reliance on them in the treatment of this affection. I have not resorted to blistering in more than one case, and in this instance it had a very good effect. The blister should be large enough to extend beyond the inflamed part, so as to vesicate a portion of the surrounding sound skin. After the plaster is removed, the blisters should be opened, and the vesicated surface dressed in the usual way, or what I should prefer, with weak mercurial ointment. When the erysipelas is seated on one of the extremities, a blister round the limb,

on the sound skin, will frequently arrest its progress in that direction. Blistering is most apt to prove useful, when the febrile excitement is moderate, the tongue moist, and the skin somewhat hot and tense.

Of late years, the mercurial ointment has been a good deal employed in erysipelatous inflammation; and Dr. Dewees speaks favorably of its use in the present variety of the disease. In one instance under my care, its effects were obviously beneficial; but in the last case I witnessed, it did no good whatever. It should be applied, by spreading it on pieces of linen, and laying them over the whole of the inflamed part. Dr. Dewees directs, it should be applied only to the inflamed margin, and a portion of the surrounding sound skin, after the vesicles have opened, and the part has become covered with a crust of concrete serum. A weak solution of corrosive sublimate, also, has been frequently employed in this country, as a local application in erysipelas, and I have, in some instances, known it to produce very excellent effects. Three grains of the sublimate to an ounce of water, forms a solution of proper strength for this purpose. Pieces of linen moistened with it, should be laid over the inflamed part, and renewed from time to time, as they become dry, until the inflammation assumes a pale color. The external use of the nitrate of silver, also, will occasionally procure decided benefit in this disease. I have more frequently succeeded in subduing erysipelatous inflammation with this application, than with any other remedy I have employed. The solution, in the proportion of five or six grains to an ounce of water, should be applied over the whole inflamed surface, by strips of linen, in the way just mentioned. In employing this remedy, the persons about the patient should be informed, that it will give a black color to the skin; for without such premonition, the discoloration of the skin will be apt to be mistaken for mortification, and excite great apprehension and anxiety of mind.

A lotion composed of sugar of lead and sub-carbonate of ammonia—one drachm of each, and a pint of water, is highly recommended by Dr. Peart, as a local application in this disease.—Some of the English surgeons speak very favorably of an oint-

ment formed of equal parts of ceratum calaminæ, ceratum saponis, and unguentum plumbi acetatis.

The practice of making free incisions through the inflamed skin, and subjacent cellular and adipose structures, has recently been greatly extolled as a means for arresting the progress of phlegmonous erysipelas. Mr. Lawrence declares, that "these incisions are followed, very quickly, and sometimes almost instantaneously, by relief, and a cessation of the pain and tension; and a corresponding subsidence of the inflammation almost always ensues. In twenty-four hours, the redness has usually disappeared, and the skin itself is found wrinkled from the diminution of the general inflammatory tension. The immediate relief, although very desirable to the patient, is, however, of less consequence than the decided influence of the practice in preventing the further progress of the disorder; and this important result has never failed to occur within my experience, when the case has been a proper one for the practice, and the state of the patient has admitted of its being fairly tried." The incisions ought to be made in the early stages of the complaint, with a view rather of preventing the ultimate consequences of the inflammation, by giving exit to the blood and extravasated serum, than of evacuating the puss and sloughed cellular membrane. "It is when the action is beginning, has commenced, or is at its acme; when the heat is burning, the thirst ardent, the tension great, the pulse active, the pain acute, and the texture engorged with blood, that incisions are most apt to prove beneficial." Mr. Lawrence recommends one long incision, extending from one boundary to the other of the inflamed part. Mr. Hutchinson, on the contrary, thinks it better to make a number of smaller incisions—about an inch or an inch and a half in length, through the skin and subjacent cellular structure. Mr. Lawrence and others have restricted this practice to phlegmonous erysipelas; but it appears from the experience of Dr. Dill, that it may be extended with advantage to other modifications of this disease.

I am not aware that this practice has ever been tried in the erysipelas of infants. It is not improbable, that it might be resorted to in many cases of this kind, with much advantage. Infantile erysipelas often presents a well-marked phlegmonous char-

acter; and in such cases, if the situation of the inflammation were favorable, I should be much disposed to try the effects of the practice.

When suppuration has taken place, an opening should be made into the most depending part of the cavity, so as to give free exit to the purulent fluid and sloughed cellular structure. If the matter is suffered to remain confined, it will make its way between the muscles and tendons, destroying the cellular tissue as it proceeds, until the patient sinks under the general irritation and exhaustion which it produces. When a portion of the inflamed part becomes gangrenous, and offensive ulcers occur, the charcoal poultice is perhaps the best application. A poultice made of crumbs of bread, and a strong decoction of oak-bark, with a small portion of yest, forms a valuable application, where the ulcers assume a phagedenic character.

CHAPTER XIII.

INDURATION OF THE CELLULAR MEMBRANE AND SKIN. SKINBOUND.

In private practice, this remarkable and very dangerous malady is but seldom met with; but in lying-in and foundling hospitals, it is of very frequent occurrence. In the *Hospice des Enfans Trouvés*, at Paris, 645 cases took place from 1808 to 1811;* and in 1826, there were 240 instances of it in the same institution.† On an average, one out of every twenty-five infants admitted into this hospital, become affected with this disease; and of those who are affected, not above twelve out of a hundred usually recover. In a vast majority of instances, the disease comes on within the first nine or ten days after birth. Mr. Billard states, that "nearly all the cases that occurred in 1826, in the abovenamed institution, were in children of from one to eight days old, and some were affected from birth." Cases, nevertheless, sometimes occur at a much more advanced period of infancy. Mr. Andrews has recorded a remarkable instance, which occurred in a child eighteen months old; and I have seen a case in a child between the sixth and seventh month of age.

In some respects, the disease is evidently closely allied to infantile erysipelas; and in others, it often manifests an obvious affinity to the convulsive affections. It usually commences on the lower parts of the body, particularly about the pubic region, and on the inner aspect of the thighs, and gradually spreads, becoming more or less conspicuous in different parts, until, in violent cases, the whole surface of the body becomes affected. The affected part is firm and incompressible to the touch, resembling the hardness and tension which occurs in *phlegmasia dolens*. The skin adheres so firmly to the indurated cellular tissue, that it cannot be pinched

* Casper. Characteristick der Franzœsischen Medicine, p. 505. † Billard, Archives Generales de Medicine, Fev. 1827.

up or moved even where it is usually most loose. In some instances, it presents a yellowish or wax-like appearance, and in others, it is of a pale red or purple color. Those parts that are reddish or purple, are generally considerably swollen; yet the swelling does not pit, although firmly pressed on with the finger. When the skin has a pale yellowish appearance, the tumefaction is, in general, very slight; but the firmness and tenseness of the part is even greater than where there is lividness. The affected parts of the skin, whether pale or purple, are remarkably cold to the touch, and the surface generally is dry and harsh. The countenance is pale and contracted, and the little patient almost constantly "makes a peculiar kind of moaning noise," and appears to be unable to make a full inspiration and to cry out, from the restrained action of the thorax. Deglutition is generally very difficult, and sometimes wholly impossible. In some cases, tetanic spasms supervene, in the latter stage of the disease; the jaws become locked, and the head and trunk are sometimes rigidly bent backwards. The pulse is usually small, irregular and rapid; and the bowels are almost always disordered—the discharges being sometimes of a bright green, and others of a whitish or clay-colored appearance. The urine is generally freely secreted, although, in some instances, the reverse takes place.

Mr. Billard asserts, that there are two distinct varieties of this disease. He considers one variety as depending wholly on the infiltration of coagulable serum into the cellular structure. Cases of this kind are characterized by considerable tumefaction of the affected parts, with a deep red or purplish color of the skin. The other variety, attended with a wax-like appearance of the skin, and but very little swelling, depends upon a hardening of the subcutaneous adipose substance without, and with but little serous infiltration into the cellular structure. The parts where the adipose hardening, and consequent tightness of the skin, are usually most conspicuous, are the cheeks, the thighs, the calves of the legs, and the back. On dissection, in cases of this kind, the adipose substance is found as firm and condensed as suet, and the skin contracted and firmly adherent to it.

The variety of the disease which arises from serous infiltration, is, according to Mr. Billard's observations, "nothing else than true

œdema, altogether of the same nature with that which occurs in adults, affected with disease of the heart, or great blood-vessels." The hardness of the skin, he thinks, "is entirely owing to its being much less loose in early infancy than at a maturer age, and consequently yielding less readily to the pressure of the extravasated fluid." In making incisions into the indurated part, an abundance of serous fluid flows from the cellular structure; and Mr. Billard affirms, that when this is done at an early stage of the disease, the skin soon loses all its hardness.

Very little of a satisfactory character has been brought to light with regard to the exciting or remote cause of this formidable complaint. It has been ascribed to the influence of cold, soon after birth; but its endemic occurrence in certain hospitals, does not favor this opinion. It is evident from this fact, that foul or deteriorated air must have a considerable agency in the production of the disease. In private practice, it is most commonly met with among the poor, who live in crowded and filthy habitations. Children who are nourished with artificial food, appear to be much more liable to the disease, than those who are nourished at the breast. In the Foundling Hospital in Paris, there are always a number of fresh nurses; and it has been observed, that whenever there is a deficiency of wet nurses in the institution, and the children are chiefly or entirely confined to artificial nourishment, the disease is most common. These facts, in connection with the circumstance, that the bowels are often much disordered, before the occurrence of the external affection, would seem to indicate that intestinal irritation, in co-operation with that depraved and irritable state of the system, which is apt to arise from breathing a contaminated air, constitutes a principal source of this malady. The causes of this disease differ, probably, very little from those which give rise to infantile erysipelas. This affection is often attended with a condition of the skin very analogous to erysipelas; and we frequently find erysipelatous inflammation associated with considerable induration of the subcutaneous cellular tissue, for some distance beyond the inflamed margin. It occurs sometimes in the progress of other diseases—particularly in protracted affections of the bowels, accompanied with biliary disorder. The case related by Mr. Andrew was

preceded by a feverish and restless state, accompanied with diarrhœa. The last case but one which I witnessed, was preceded for upwards of two weeks with loose and griping stools, a general irritated state of the system, and an obstinately dry skin. Hardening of the cellular structure and skin is frequently accompanied by a jaundiced appearance of the surface. M. Billard states, that in the Parisian foundling institutions, "the most common accompanying disease, is jaundice."

On post mortem examination, the cellular tissue is generally found thickened, condensed, engorged with serum, and often of a dense, reddish, and granular appearance, "not unlike a portion of hepatized lung." In many cases, the adipose substance is peculiarly consolidated, with more or less infiltration into the cellular membrane. The lymphatic glands are frequently found indurated and enlarged, more especially those of the mesentery. Out of ninety cases examined by Mr. Billard, there were twenty that presented a decidedly morbid condition of the liver; and fifty, in which there was inflammation of the alimentary canal. In all the cases, there was "a very remarkable general congestion. The venous blood especially predominated in the different tissues." Mr. B. thinks that this congestion does not depend on mechanical obstruction in any point of the circulation, but is due to "a general superabundance of blood in the system, or a kind of congenital plethora." From the remarkable and unconquerable dryness of the skin, there is evidently "some derangement of the capillary circulation;" and this morbid inactivity of the cutaneous exhalents, in conjunction with a general plethoric and irritative condition of the system, constitutes, perhaps, the immediate cause of cellular infiltration and tension of the skin.

Treatment.—Although an extremely dangerous affection, this singular malady is not so entirely beyond the control of remedial treatment as was formerly supposed. Out of 645 cases which occurred in the Hospice des Enfans trouvés, from 1808 to 1811, there were 78 cured; and the proportion of recoveries has of late years been considerably greater. Mr. Billard thinks that the opinion respecting its fatality, has arisen, in a great degree, from

the circumstance of its being very frequently associated with other diseases of a dangerous character.

The *aqueous vapor bath* is decidedly the most valuable remedy that has hitherto been recommended for the cure of this affection. As soon as the disease makes its appearance, the infant ought to be subjected to the vapor bath; and this should be repeated every three or four hours, until the skin becomes moist and soft, and the tightness and hardness has disappeared. The heat of the vapor should not exceed 105°; the most comfortable and salutary temperature being from 98 to 100°. When the child is taken out of the bath, it should be wrapped up in warm and dry flannel, and laid in its bed. The simple application of warm flannel immediately to the skin, and frequently renewed, will sometimes bring on a gentle perspiration, and reduce the local œdema.* If no suitable apparatus for applying the vapor be at hand, the infant should be laid in its bed, and hot bricks wrapped up in wet pieces of flannel, placed a short distance from its body under the covers, supported by hoops or some other contrivance, so as to leave a free space for the accumulation of the vapor. Richter speaks very favorably of the effects of blisters in this complaint. When early applied to the affected parts, they may remove the sanguineous engorgement of the sub-cutaneous structures, and arrest the progress of the induration. The only instance of recovery which has occurred in my practice, was effected by the vapor bath, and blistering. The induration commenced on the anterior surface of the left thigh and groin. An epispastic was applied over the whole surface of the affected part, and suffered to lie about three hours, when it was substituted by a large emolient poultice. The tumor and hardness of the part were obviously diminished by the blistering, and they did not extend beyond the limits which they occupied when the blister was applied. As the liver and bowels are generally more or less disordered, minute doses of calomel, in union with ipecacuanna, as recommended in infantile erysipelas, may be employed with occasional advantage.—Some writers, indeed, look upon calomel as a remedy of indis-

* In the foundling hospital at Florence, this disease is treated by the application of external heat, made by keeping the infant wrapped up in warm flannel, in conjunction with stimulating frictions.

pensable importance; and there can be no doubt, that when the disease is attended with prominent disorder of the liver, its influence will often be highly salutary. In those cases that are accompanied by a jaundiced appearance of the skin, mercurials are especially indicated, and can never with propriety be wholly neglected. It appears to me not improbable, that free incisions through the skin and subjacent cellular tissue would prove beneficial. The engorgement of the subcutaneous capillary vessels ought, perhaps, be removed in this way, and exit given to a portion of the infiltrated serum—effects which could hardly fail doing good, in certain cases of this complaint. The tepid or warm bath, which has been much recommended by some German writers, appears to be much less beneficial than dry warmth, or the vapor bath; and it is even asserted, that warm bathing has frequently proved injurious.

CHAPTER XIV.

OF THE CORYZA OF INFANTS.

This disease was first described by Underwood, under the name of *coryza maligna*—an affection, which, he says, "is not only far more severe, but of a very different character," from the complaint which passes under the name of the "snuffles." Dr. Denman, who, afterwards, published a more ample and circumstantial account of this malady, speaks of it as "a new and very peculiar affection." It appears to occur but very seldom; and it is doubtful whether it has ever been observed in this country. I have met with one case, which appeared, in many respects, to accord with the descriptions given of this complaint by Underwood and Denman; but it was, probably, nothing more than an aggravated case of the common coryza from cold. It was at first supposed, that it never occurred in infants over a month old; but Underwood states, that he has seen instances of it at a much more advanced age.

The disease is characterised by a purulent discharge from the nose, acquiring in some instances, a sanious character, attended with complete stoppage of the nostrils, and great difficulty of breathing, especially during sleep. The infant appears pale and languid, and a singular purple streak encircles the margin of the eyelids, which Mr. Denman was disposed to regard as pathognomic. There is usually "a general fulness about the throat and neck externally," which comes on soon after the purulent discharge from the nose commences. After these symptoms have continued for some days, the tonsils and fauces present a tumified and dark-red appearance, "with ash-colored specks upon them," terminating, in some cases, in extensive ulcerations. As the disease advances, the infant declines rapidly in strength; and the breathing, often, becomes so difficult, that an attendant "is re-

quired to watch the little patient, in order to open its mouth as often as it may be requisite to prevent suffocation." The disease usually continues two or three weeks, and when it does not terminate in death, is very apt to leave a state of chronic indisposition, attended with much disorder of the alimentary canal.

This appears to be a very dangerous affection. Denman states that of eight cases which he witnessed in the course of about a year, two, only, recovered. Dr. Underwood, however, observes that the cause of its frequent fatality, when it was first noticed, arose, rather from the true nature of the disease having been imperfectly understood, than from any positive difficulty in controlling its progress by remedial management. The disease appears to consist in a peculiar inflammatory affection of the mucous membrane of the nasal cavities, extending backwards to the fauces and, in some instances, descending into the stomach and bowels, giving rise to painful and exhausting diarrhœa. The alvine evacuations are frequently of a peculiar bluish or green color, particularly after the employment of repeated purges. Mr. Hunter and Mr. Home examined the body of an infant that had died of this malady; but the only morbid appearance they discovered was a dark-red and highly injected state of the lining membrane of the nose.

Treatment.—According to the experience of Dr. Denman, the employment of laxatives so as to keep the bowels freely open, and remove from them the acrid matter which descends into the stomach from the nose, constitutes "the grand means of cure." If this be not constantly attended to, painful and rapidly wasting diarrhœa almost invariably arises from the irritating fluid that is continually passing into the stomach. The free use of mucilaginous drinks, also, will be beneficial in this respect. Harsh purgatives, however, are highly improper, as they could scarcely fail to produce almost as much irritation as the irritating cause which they are intended to remove. "One or more teaspoonfuls of castor oil should be given, every day, so as to procure three or four motions daily. It is remarkable, that even weak infants endure purging better under this complaint than under any other, unless it be the fever caused by painful dentition" (Underwood).

The employment of mild clysters also will be proper,—more especially, when the lower part of the rectum becomes considerably irritated. Dr. Denman states, that he often derived much benefit from small doses of opium, or the syrup of white poppies. There can be no doubt of the great propriety of using narcotics in this affection, for it is evidently attended with an irritative state of the general system, without a very active inflammatory condition, or a tendency to high febrile excitement. Dover's powders, given in small doses, would, probably, have a very beneficial effect, by allaying the morbid irritability and disposing to general diaphoresis. When the disease continues for several weeks, and "the infant becomes pallid and very feeble, a recourse to the decoction of oak bark has at once removed the snuffling, and given vigor to the infant in the course of a few days." The sulphate of quinine would, doubtless, be a useful remedy in cases attended with much debility and exhaustion. The disease sometimes assumes a chronic character, and continues four or five weeks, and occasionally for several months. Such cases are apt to be attended with occasional attacks of spasmodic respiration, "as if the infant were dying." This symptom, "as well as the snuffling often recurs some time after the child seemed to be cured:" and even the purulent discharge from the nose, may recur from time to time, after the disease appears to have been wholly subdued. In cases of this kind, Underwood, besides purging, recommends fomenting applications to the bridge of the nose; and "afterwards to apply some aromatic liniment." The application of a few leeches to the root of the nose would, perhaps, be beneficial in the early as well as in this advanced stage of the disease. There appears to be some risk in using vesicatories in this affection; for Underwood observes, that "the parts on which blisters had been laid in the beginning, and which had been apparently healed, often sphacelated towards the conclusion."

CHAPTER XV.

OF THE APHTHÆ OF INFANTS. THRUSH.

This is one of the most common diseases of infancy. It is characterised by a peculiar eruption of minute pustules, giving rise to a whitish incrustation of the tongue, and lining membrane of the mouth and fauces. The aphthæ sometimes make their appearance without any previous symptoms of general indisposition, or disorder of the alimentary canal. Much more frequently, however, symptoms of disorder of the stomach and bowels, associated with manifest languor and drowsiness, precede the occurrence of the aphthous affection. The aphthæ usually appear, first, on the inner surface of the angle of the lips, and about the tip of the tongue, in the form of white specks, resembling small flakes of coagulated milk. From these parts, the eruption spreads, more or less rapidly, until, in some instances, a continuous aphthous crust is formed, over the whole surface of the tongue, mouth and fauces. In many cases, however, the eruption is much less extensively diffused, the aphthæ occurring only on the tongue, and central parts of the cheeks; and we occasionally find them scattered in small patches with intervening spaces, over the lining membrane of the mouth and surface of the tongue. In these mild cases the infant seldom experiences any particular uneasiness or disturbance from the local aphthous affection; but when the eruption is extensive, it rarely fails to give rise to more or less suffering and disorder in the system. In cases of this kind, there is, generally, much thirst, restlessness, languor, acid and flatulent eructations, loose, green, and griping stools, drowsiness, pain, and difficulty of sucking, and a copious flow of saliva and mucus from the mouth. The skin is usually dry and harsh; and, in the severer instances of the disease, a slight degree of febrile irritation often occurs. The stomach and bowels are almost always prominently disordered in such

cases. The infant is apt to vomit after taking any thing into its stomach, and the milk is generally thrown up, in the form of firm coagula. Profuse watery diarrhœa frequently ensues, and the little patient is greatly harassed by sour and offensive eructations, griping and colic pains, and tenesmus from the extremely sensible and excoriated condition of the margin of the anus. Under these symptoms emaciation and loss of strength go on rapidly; the child's countenance becomes pale, sunken, and expressive of much suffering and uneasiness. The difficulty of swallowing increases, and at last sometimes becomes altogether impossible. The abdomen is always sore to the touch, in cases of this violent character, and frequently much distended and tympanitic. If the disease is not arrested, the infant, at length, dies in convulsions, or in a state of stupor and insensibility, resembling the last stage of hydrocephalus, or from exhaustion.

In mild forms of the disease, the aphthous eruption continues of a white or yellowish color throughout; but in severe cases it soon acquires a dark brownish color, and instead of being soft and humid, as in the ordinary instances, it often becomes dry and harsh, as the disease advances. It is generally believed, that the aphthæ frequently extend from the mouth, throughout the whole tract of the alimentary canal. Dr. Dewees is disposed to doubt whether such an extension of the eruption does ever occur. He is inclined to believe that it never passes lower down than to the cardiac extremity of the œsophagus. In examining the body of an infant that had died from aphthæ, he found "the whole tract of the œsophagus literally blocked up with an aphthous incrustation to the valve of the cardia, where it suddenly stopped. Not a trace of aphthæ was discovered below this place." I have myself had an opportunity of examining the body of an infant, that had died of this disease. In this case, the aphthæ were very distinct through out the whole course of the œsophagus. The stomach and bowels presented nothing that bore any resemblance to this eruption; but there were decided marks of inflammation in the mucous membrane of the small intestines, with a vast number of minute superficial ulcerations, and larger patches of softening of this tissue, throughout the colon, and lower part of the rectum. The mucous membrane of the alimentary canal, doubtless, always becomes

more or less diseased in the severer forms of this malady. It is probable, however, that the minute pustules, which give rise to the aphthous incrustation on the more dense mucous membrane of the mouth and œsophagus, terminate speedily in superficial abrasion, or ulceration, in the delicate mucous tissue of the stomach and bowels. In the case which I examined, these minute ulcerative points were very obvious in several portions of the large intestines. The excoriation of the anus, which is generally regarded as an evidence that the aphthous affection has passed throughout the whole extent of the alimentary canal, arises, perhaps, solely from the irritation produced by the acrid discharges from the bowels. Tenderness and excoriation of the anus is by no means an uncommon consequence of acrid diarrhœal discharges.

The duration of this affection is very various. In slight cases, the aphthæ disappear in a few days, without any unpleasant consequences. In some instances, the aphthous eruption continues for several weeks, without becoming very severe, or causing any material deviations from health. Sometimes, the aphthous crust falls off, and is soon succeeded by another one; and these separations and renewals of the eruption, may occur three or four times, in the course of the malady. "The oftener the crust is renewed, the worse it becomes, for each new eruption is usually thicker and less white, than the preceding one." When the crust falls off, it exposes a smooth, red and slightly excoriated surface. The cavity of the mouth is always unnaturally hot, and the affected parts are, in general, very sensible and painful when pressed on or touched.

Infantile aphthæ very rarely occurs a second time in the same infant—at least as an idiopathic affection. It may, indeed, recur frequently, at every stage of life, as a symptomatic effect of other diseases—particularly in the advanced stages of protracted maladies attended with irritation of the alimentary canal. But it is extremely doubtful, whether these secondary or symptomatic affections are identical in their character, with the usual aphthœ of infancy.

Some writers affirm that the disease is very rarely, if ever, attended with fever; whilst others declare that the occurrence of febrile irritation in this complaint, is very common. Hecker di-

vides the aphthæ of infants into three varieties. His second variety, which he affirms is very common in Germany, is always attended with decided febrile symptoms; and he thinks that the disease is closely allied in its nature, to the exanthematous fevers. It commences with manifestations of lassitude, restlessness, drowsiness, and much thirst. The child seizes the nipple eagerly, but immediately leaves it again, and cries, as if the effort of sucking gave it much pain. The cavity of the mouth is hot, dry, red, and very sensible. The child is apt to vomit; frequent watery, green, and painful alvine discharges occur, and the urine becomes scanty, the pulse is accelerated, and the skin preternaturally warm and dry; the voice becomes rough and slightly hoarse; and finally, after these symptoms have run on for three or four days, the aphthous eruption makes its appearance. Dr. Hecker asserts, that when the disease occurs epidemically, it almost always assumes this febrile character, assuming, in some degree, the regular progress of an exanthematous fever. According to my own observations, the ordinary simple cases of the disease are invariably without the slightest manifestations of fever. When the eruption is extensive, however, and there is much disorder of the alimentary canal, slight febrile symptoms are certainly often developed. I am at present attending an infant severely affected with this complaint. The aphthous crust extends over the whole surface of the tongue, mouth, and fauces, and from the manifest pain on swallowing, probably passes down to a considerable distance into the œsophagus. This child is in a decidedly febrile condition; although before the aphthous eruption appeared, its general health seemed to be good. The febrile symptoms that occasionally attend the ordinary forms of the disease, depend, probably, chiefly on the inflammatory irritation which is apt to occur in the alimentary canal, and are wholly accidental.

In hospitals, this disease sometimes assumes a highly dangerous character. In the French foundling institutions, it is said to carry off a great many infants. In these malignant cases, the aphthous crust soon becomes thick and of a dark brown color. When it falls off, it leaves a number of yellowish-brown ulcers, of a corroding character. The diarrhœal discharges are green, and extremely acrid, and the vital powers sink very rapidly. Is the aphthæ

or thrush of infants a symptomatic or an idiopathic affection? The general opinion appears to be, that it is altogether symptomatic—occurring as an accidental consequence of gastro-intestinal disorder. Dr. Dewees, expresses himself in a very ambiguous, or rather contradictory manner, on this point. In the beginning of his chapter on this disease, he says, "that this affection is one of a symptomatic kind—rarely, perhaps never, idiopathic;" yet in a subsequent paragraph, he observes, "the opinion so commonly credited, of its being a symptomatic affection, is very questionable;" and then goes on to give a number of "facts," which he says have "lately" led him "to question the sympathetic origin of aphthæ." Nevertheless, the very next paragraph commences in these words: "This *symptomatic* affection is not confined to early infancy." The fact is, the arguments which led the Doctor to doubt the correctness of his opinion, that the disease is purely symptomatic, would have convinced him of its entire erroneousness, if he had not viewed them through the medium of a contrary sentiment long and thoroughly entertained. It takes a powerful battery of "facts" to knock down an opinion that has become firm by age. For my own part, I am well satisfied that the disease, as it occurs in early infancy, is of a peculiar and strictly idiopathic character; although an aphthous affection of the mouth may, and often does, occur at every stage of life, as a symptomatic or secondary phenomenon of other forms of disease, or morbid conditions of the digestive organs. We see this often, in the last stage of phthisis pulmonalis, and in nearly all protracted diseases of a febrile and exhausting character, as they approach a fatal termination. It is, also, frequently observed in children, as an attendant on other maladies; particularly such as are attended with disorder and inflammatory irritation of the alimentary canal.

If the aphthæ of infants were a purely sympathetic affection, depending on disorder or irritation of the alimentary canal, it could of course never take place without the previous occurrence of gastro-intestinal disorder. Cases, however, do occur, in which no obvious signs of derangement of the digestive or intestinal functions can be noticed. Dr. Dewees states that he has seen two instances, in which the alimentary canal "was in the most perfect order; and I have, certainly, witnessed several cases which

were entirely free from any manifestations of disorder of the stomach and bowels. It may be presumed, too, that were the disease symptomatic in its origin, derangement of the alimentary canal would be much more frequently associated with aphthæ, than it is known to be. At every period of life, from early infancy to advanced age, disorder and irritation of the stomach and bowels occur very frequently, and pass through every grade of violence, without giving rise to aphthæ. Mere disorder or irritation of the alimentary canal, is very rarely productive of aphthous eruptions in the mouth, unless it be connected with a chronic form of febrile irritation, and general exhaustion. In infantile aphthæ, however, the child often appears to enjoy good health, up to the time when the aphthæ make their appearance; and in mild instances, there is frequently no material indisposition during the continuance of the aphthous eruption. This, I believe, never occurs in the aphthous affections which take place at a more advanced age. These cases are always, unequivocally, connected with serious general maladies, and seldom occur, until the diseases of which they are symptomatic phenomena, have acquired a highly dangerous, if not a necessarily fatal degree of violence. The circumstance, however, which seems most clearly to shew that infantile aphthæ is a peculiar idiopathic affection, is the fact, that infants who have passed through the disease, very seldom become affected with it a second time, although the stomach and bowels may become repeatedly disordered, and remain so, during the subsequent period of infancy and childhood. We often see infants affected with aphthæ, previous to the third month, with very little disturbance in the alimentary canal; yet they will not become affected with it again, although they may afterwards be repeatedly and long harassed by disorder of the stomach and bowels. The circumstance, too, that this affection is almost wholly confined to the age of infancy, would appear to indicate that there is an essential peculiarity in its character and mode of origin. If it were an accidental sympathetic phenomena of gastro-intestinal irritation, without any specific peculiarity in its nature, we should expect to meet with it at every period of life, instead of seeing its occurrence almost entirely restricted to a particular stage of childhood. The occasional appearance of this infantile malady in an epidemic

manner, is also manifestly opposed to the idea of its being a purely symptomatic affection. In some foundling hospitals in Europe, it has frequently prevailed endemically for a season; an occurrence which could not, with the slightest plausibility, be ascribed to any disorder of a symptomatic character. In mild cases, the aphthous affection may often be speedily removed, by local applications to the mouth, alone; and occasionally, even severe instances will yield to remedies of this kind, without the employment of any thing for improving the general health, or correcting the morbid condition of the alimentary canal (Dewees.) From a view of the foregoing considerations, the idiopathic character of infantile aphthæ can, I think, hardly be doubted. It is very manifest, however, that disorder of the stomach and bowels, contributes very materially to the production of this disease, either by creating a predisposition to it, or by exciting the latent tendency in the infantile system to its occurrence.

Feeble and sickly children scarcely ever escape this disease; and they are much more apt to become severely affected with it than those who are of a robust and healthy habit of body. Whatever is capable of disordering the stomach and bowels, may be regarded as an exciting cause of the disease. Unwholesome and indigestible nourishment, and over-distention of the stomach, during the early stage of infancy, almost inevitably lead to the occurrence of aphthæ. Bad and old milk, and thick farinacious preparations sweetened with brown sugar or molasses, are especially apt to give rise to the disease. Inattention to keeping the infant's mouth clean by occasionally washing out the sordes with a soft piece of linen and fresh water, and particularly the nauseous practice of permitting the child to suck portions of food tied up in a piece of cloth in the form of a nipple, contributes greatly to the production of the aphthous eruption. Breathing an impure and deteriorated air, also, appears to have a decided tendency to favor the occurrence of this malady. Children who are kept in crowded and ill-ventilated apartments, or who are suffered to sleep much under the bed-clothes, are especially liable to become affected with it. The occasional great prevalency and fatality of the disease in foundling institutions, doubtless arises, in part, from this cause. When improper nourishment co-

operates with foul air, the disease is apt to acquire a highly dangerous character. It has been supposed that the apthæ of infants is often propagated by a specific contagious virus. Dr. Good is of this opinion, and refers, as some of the German writers do, to the excoriations, which frequently occur on the nurse's nipples, when the nursling is affected with aphthæ. There is evidently a very acrid and irritating fluid discharged from the minute pustular eruption, which occasions the aphthous crust; and when the nipples are tender, they can scarcely fail to become more or less inflamed and excoriated, by the impressions of this acrimonious secretion. In hospitals, where several infants often suckle the same nurse in succession, it is not improbable that the occurrence of the disease may sometimes be favored in this way. The natural predisposition to the disease, appears to be much stronger in some families than in others. In my own, consisting of eight children, this affection has never occurred, although all of them suffered from the usual stomach and bowel complaints of infancy.

Treatment.—As the alimentary canal is almost invariably more or less deranged in the aphthæ of infants, a principal object in the treatment must, of course, be to remedy the disordered condition of the stomach and bowels. In general, the ejections from the stomach are sour, and the alvine evacuations of a grass-green color. When this is the case, magnesia, with small portions of rhubarb and powdered valerian, will generally prove very beneficial. I have more frequently derived decided advantage from this mixture, than from any other mode of administering magnesia. From three to four grains of magnesia, with two grains of rhubarb, and one grain of powdered valerian, should be given every two or three hours, until the bowels are freely evacuated. If there is much general irritability and restlessness, the tepid bath, followed by a drop or two of laudanum, should be employed after the magnesia has operated on the bowels. The mucous membrane of the intestines is apt to become highly irritated in severe cases, after the aphthous eruption has continued for some days. The alvine evacuations, in such instances, become very frequent, small, watery, with occasional streaks of blood, and painful; and the margin of the anus red and extremely sensible. In cases of

this kind, a large emolient poultice over the abdomen, in conjunction with the internal use of minute portions of Dover's powder, with a solution of gum arabic as drink, has frequently proved highly beneficial in my practice. Dr. Dewees speaks very favorably of the *oil of butter*, when the bowels are much irritated. "The oil of butter is prepared by putting a lump of perfectly sweet butter into a cup, and pouring on it a quantity of boiling water, and agitating it well with a teaspoon, that it may be deprived of its salt—the oil is then skimmed off, as it is wanted. A teaspoonful may be given three or four times daily." I have used this oil in a few instances, but it did not appear to answer quite so well as a pretty thick solution of gum arabic, given in teaspoonful doses at short intervals. Magnesia, and other purgative remedies, seldom fail to do harm in cases attended with much intestinal irritation. In a few instances of extremely obstinate aphthæ, accompanied with frequent irritating stools, and an excoriated state of the anus, I have procured marked benefit from a very weak solution of the nitrate of silver. Incompatible as the article may seem to be with a highly irritated state of the mucous membrane of the bowels, it nevertheless often exerts a very soothing effect on this tissue, when under peculiar forms of irritation. I have given about half a teaspoonful of a solution of a grain of this article to two ounces of water, every four hours, to infants between two and six months old, with unequivocal advantage, and without the slightest aggravation of the sufferings of the patient. In cases attended with much acid in the stomach, without a great deal of intestinal irritation, or diarrhœa, lime-water, with a weak infusion of peruvian bark, usually produces an excellent effect. When the acidity of the primæ viæ is accompanied with free diarrhœa, without any symptoms of inflammatory irritation of the bowels, prepared chalk, in union with minute portions of Dover's powder, generally proves decidedly useful. From four to six grains of the chalk, with the fourth of a grain of Dover's powder should be given every two or three hours, until the diarrhœa is checked, and the discharges assume a more natural color. I have given powdered borax internally in aggravated cases of infantile aphthæ, with very decided advantage. There is nothing in this article that forbids its internal employment.

The Germans use it frequently in this way; and I have, myself, often resorted to it, in bowel complaints, with evident benefit. In the present disease, I am persuaded that it may be given internally, with peculiar advantage, in the severer forms of the complaint accompanied with frequent irritating diarrhœal discharges. I have been in the habit of applying large fomenting poultices over the abdomen, in cases of an aggravated character; and I am satisfied that this application is capable of doing much good. When the disease runs on for a long time, and the little patient becomes much exhausted, mild tonics and stimulants should be employed to support the system. Weak wine whey—infusion of cinchona, or a weak solution of quinine, in moderate portions, may be resorted to for this purpose.

If the infant is not weaned, it should receive no other nourishment than its mother's milk. If it is nursed with artificial nourishment, nothing but the most bland alimentary preparations ought to be used. A solution of gum arabic, cow's-milk and water, barley-water and weak chicken or beef tea, form proper articles of food for this purpose. If the child is nourished at the breast, an attention to dietetic regulations on the part of the mother, is believed to be of considerable importance. She ought to avoid the ordinary articles of vegetable food, as they favor the generation of acid in the primæ viæ. All kinds of spirituous and fermented drinks, too, have an unfavorable tendency, and ought to be particularly avoided. The more digestible meats, soft-boiled eggs, rice, stale bread or crackers, fresh butter, with weak tea or coffee, constitute appropriate articles of nourishment in cases of this kind.

Local applications are generally highly serviceable, and in slight cases, are, by themselves, often sufficient to remove the disease in a few days. Borax is a familiar remedy with nurses and mothers, as well as with the profession, for this purpose; and it is doubtless the most valuable article we possess, as a local remedy in this affection. It may be used in the form of powder or solution. If the former is employed, two or three grains of it, mixed with a small portion of pulverized loaf-sugar, must be thrown into the mouth every two or three hours. If the solution be used, a drachm of the borax should be dissolved in two ounces

of water. This may be applied to the mouth, with a soft linen rag, tied to the extremity of a pliable piece of whalebone or wood, or with a soft feather. The powder, however, is the most convenient mode of applying this remedy. In making local applicat tions, care should be taken that the aphthous crust be not rudely rubbed off. This always causes much pain to the infant; and is calculated to increase the inflammation and keep up the disease. The practice of forcibly rubbing off the aphthous eruption with a piece of linen, on the point of a finger—so common with ignorant nurses, is extremely reprehensible. Nothing can be gained by this rude and painful treatment, and much mischief may readily result from it to the little patient. When rubbed off in this way, the crust is, almost always, soon renewed in an aggravated form, and the irritation in the mouth is generally much increased. So long as the aphthous incrustration remains white, the borax may be deemed the most efficient local remedy. When the eruption assumes a yellow or brown color, however, it frequently fails to do any decided good. In such cases, Dr. Dewees generally employs "the armenian bole, in fine powder, with loaf sugar," small portions of which mixture, are, from time to time, thrown into the mouth, as directed above for the borax. "Should this fail," he says, "to give pretty speedy relief, and particularly if the mouth be very red, livid or ulcerated, we then have recourse to a weak decoction of bark." A half ounce of powdered bark, boiled about thirty minutes, in half a pint of water, forms a proper decoction for this purpose. "About the third of a teaspoonful of this is put into the child's mouth, every hour or two." I do not doubt that these remedies are capable of procuring much relief in cases of this kind. Instead of the armenian bole, however, I prefer using a weak solution of the nitrate of silver, in the proportion of a grain to an ounce of water, and applying it with a soft piece of linen fixed to the end of a thin piece of whalebone. Nothing need be apprehended from the introduction of a small portion of this fluid into the stomach. On the contrary, its effects on the morbid condition of the mucous membrane of the alimentary canal, are often decidedly salutary in cases of this kind. A decoction of oak-bark, par-

ticularly where there is much diarrhœa, will sometimes produce a very good effect as a local remedy.

As the acrid alvine discharges are very apt to inflame and excoriate the parts about the anus, constant attention should be paid to keeping these parts as clean as possible. The nates should be frequently washed with tepid milk and water, or with flax-seed tea; and after they are carefully dried, fresh lard should be applied over the irritated parts, to afford them some degree of protection against the impressions of the acrid evacuations. When the inflammation and sensibility of these parts become very severe, they should be occasionally, washed with a weak solution of sugar of lead, mixed with proper portions of a watery solution of opium.

CHAPTER XVI.

ULCERATION OF THE MOUTH.

Children are liable to an ulcerative affection of the mouth, which is evidently, entirely distinct in its origin and character, from the ordinary aphthous eruption. It consists, in a number of small ash-colored and excavated ulcerations, with elevated edges, situated about the frœnum, and along the inferior margin of the tongue, the gums, and on the cheeks. The ulcers usually begin in the form of small, red, slightly elevated and painful points. At first they are superficial, and occasionally even somewhat raised above the surrounding skin; but in the course of a day or two, the edges rise up, and the ulcerated surface becomes considerably excavated. When the ulcers appear on the upper surface of the tongue, which, however, occurs but seldom, they are generally quite superficial, appearing more like excoriations than actual ulcerations.

The disease commences with slight symptoms of febrile irritation. The child manifests some degree of lassitude and restlessness. The skin becomes warmer and dryer than natural, the pulse somewhat accelerated and sharp, the bowels usually costive; there is generally much thirst; the tongue is coated with a thin white fur, over which, a thick layer of transparent slime is pread, and there is a constant profuse discharge of saliva and mucus from the mouth. The mind and body are peculiarly irritable. The child is generally exceedingly fretful and uneasy, "especially when it is about to take the nipple, which it frequently seizes, and then lets go, with a whining cry as if in pain." The febrile symptoms usually continue for two or three days, and often much longer, before the ulceration commences. After the ulcers are formed, however, and the slavering is profuse, the fever generally subsides. In some instances the ulceration of the gums and

cheeks becomes very extensive. In cases of this kind, a slow, exhausting fever is apt to occur, which generally renders the management of the complaint very difficult. I have met with two cases of this disease, in which the gums were almost entirely destroyed. In one of them, the whole inferior maxilary bone was at length deadened and separated, and was removed by Dr. McLellan. These aggravated instances of the complaint, are fortunately not common, and the disease is, in general, easily managed when early attended to.

This affection is almost always associated with weak or disordered digestive functions, and a bloated and torpid state of the bowels. Children whose breath is offensive, with a variable appetite, and a tumid and hard state of the abdomen, are most liable to this complaint. The irritation of dentition, doubtless, contributes, in some degree, to the production of the disease; but the primary source of the complaint, appears to be located in the alimentary canal.

Treatment.—Purgatives are highly useful remedies in this complaint. The bowels should be freely evacuated, though not with harsh or very active purges. A small dose of calomel, followed, in the course of four or five hours, by a suitable dose of castor oil, will answer this purpose very well. The oil without the calomel, or a proper dose of magnesia, should be repeated daily, until the febrile symptoms are subdued. Even where no fever is present, mild laxatives are highly useful, more especially, if the abdomen be full and somewhat tense. I have known much benefit derived, from the use of a few mild emetics in cases of this kind. When the breath is offensive, and there is a tendency to nausea and vomiting, the exhibition of an ipecacuanna vomit, will frequently do much good. In a case of a severe character, which I saw, about a year ago, I ordered five grains of ipecacuanna, with two grains of calomel. Active vomiting was induced, and three or four alvine evacuations followed. On the following morning, the child's mouth was evidently better; and it continued to improve rapidly. The tepid bath, and gestation in the open air, if the weather be mild, will often aid considerably in arresting the local ulcerative affection. After the operation of a purgative,

the general irritability of the system should be allayed, by a few drops of laudanum, or one or two grains of Dover's powder. In using calomel in this affection, great care ought to be taken, lest it affect the gums—an occurrence, which could hardly fail to impart a dangerous character to the ulcerations.

When the febrile irritation is subdued, much advantage may be procured from local applications. A solution of the sulphate of copper, mixed with a portion of honey, will generally soon improve the appearance of the ulcers, and hasten their healing. Ten grains of the sulphate should be dissolved in about three teaspoonfuls of water, to which four teaspoonfuls of honey must be added. This solution must be applied to the ulcers, once or twice daily, by means of a strong camel's hair pencil. Dr. Dewees advises the addition of two drachms of powdered bark, and a drachm of powdered gum arabic to this solution; but I have not found it to answer better, than the simple solution I have mentioned. Touching the ulcers, with a solution of the nitrate of silver, also, is an excellent local remedy. In several very severe cases, I obtained more decided benefit from this application than from the sulphate of copper. In slight instances of the disease, a strong decoction of oak bark, with a small portion of alum dissolved in it will generally suffice to arrest the progress of the ulcers, and dispose them to healing. I have derived evident benefit, in cases of this kind, from the internal use of small portions of powdered charcoal.

The diet should be particularly attended to. If the child is still nourished at the breast, its mother's milk is doubtless the best nourishment. If it has been weaned, however, nothing but the simplest and mildest articles of food should be allowed. If, however, the child has been previously, almost exclusively nourished by farinaceous aliment, it will in general be useful to change it, in part, for beef or chicken tea, or very light and simple broths. Solid food must on no account be allowed; more especially salted meats or fish.

Dr. Underwood has described a variety of ulceration of the mouth, under the name of *Aphtha gangrenosa*, which appears to differ materially from the preceding affection. It seldom oocurs in children under two years old, and has been but rarely noticed after the ninth year of age. It usually commences with a swollen

spongy and dark-colored condition of the gums, attended by "great tenderness of the inside of the cheeks and mouth." In the course of a day or two, small dark-colored ulcers appear on "the gums, the inside of the lips and upon the tongue;" and occasionally, ulcers of the same appearance occur on the tonsils and uvula. "As the disease proceeds, the cheeks become slightly tumefied, and are very tender when touched; and there is often an unusual redness upon that portion of the skin which covers the lower jaw." The tongue is covered with a thick yellowish brown fur, becoming darker as the disease advances, and the teeth are apt to become covered with a black sordes. The breath becomes extremely offensive after the ulceration has made some progress. There is usually a very copious flow of saliva from the mouth. There is from the commencement of the complaint considerable febrile irritation. The child becomes languid and feeble, the pulse small and quick, and the skin very warm and dry; the appetite is impaired, but the little patient often sleeps well, and at times appears cheerful and disposed to amuse itself with play. The disease may continue for a period of from two to five or six weeks.

Dr. Dewees says that this variety of ulceration of the mouth, occurs only, when children are cutting teeth, particularly when a number of back teeth, are about making their appearance at the same time; and this accords entirely, with my own observations. It is a disease of the gums, arising from cutting the last of the first set of teeth—it therefore never attacks after this process (primary dentition) is completed; or at least not until the teeth of the second dentition are about to appear. The gums at first swell and become dark red and very tender. In the course of two or three days, "the parts of the gums immediately over the teeth about to be protruded give way by ulceration to a greater or less extent" (Dewees.)

This disease, though of an alarming appearance, is by no means a dangerous affection. In children of a sickly and scorbutic habit of body, however, it sometimes becomes very troublesome, and resists, for a long time, the usual remedial applications in diseases of this kind. The swollen parts of the gums ought to be divided down to the advancing teeth; and the child's mouth

frequently washed with a strong decoction of peruvian bark. I have used a solution of the chlorite of lime, with a most excellent effect in several severe instances of this affection. I dissolved a drachm of the chlorite in six ounces of water, and applied it with a soft piece of linen tied to the end of a probe. A decoction of oak bark too, with or without a small portion of alum forms an excellent application.

CHAPTER XVII.

OF COLIC.

There are very few infants who do not suffer more or less from colic pains. In many instances, indeed, they are so slight and transient, that they require no particular remedial attention. Very frequently, however, they become extremely harassing, recurring often, and with great severity, during the first five or six months of infancy. In some cases, these painful attacks occur several times daily, at uncertain intervals; and in others, they come on at regular periods, assuming a distinctly periodical progress.

In slight cases of colic pains, the infant suddenly becomes very fretful, draws up its legs towards the abdomen, and whines or cries for a few moments and then resumes its usual quiet condition. After a very short interval of rest, another attack, of the same kind occurs, and again soon subsides; and thus, it will go on, with alternate spells of crying and quietude, until a volume of wind breaks from the stomach or bowels, or a thin fœcal discharge takes place, when entire relief ensues. In many cases, however, these manifestations of suffering are much more vehement and distressing. There is excessive, long-continued and unappeasable screaming, forcible drawing up of the legs, or violent kicking, flushing of the face, and various writhings of the body

with a distended, tense and tympanitic state of the abdomen. In the majority of instances, these attacks are associated with habitual symptoms of indigestion and disorder of the bowels—such as acid eructations, flatulency and diarrhœa. The stools are frequently of a grass-green color, or slimy, and occasionally mixed with portions of imperfectly digested food. In some cases, however, the alvine discharges are neither too frequent nor of an unnatural appearance, although the infant almost daily experiences severe paroxysms of colic. The breath often has a peculiarly acid smell, and when vomiting occurs, which, however, is not often the case, the milk, if the child is nourished at the breast, is thrown off in dense coagulated masses. When the colic pains come on frequently, and are attended with prominent symptoms of indigestion and diarrhœa, the general health of the infant almost always suffers obvious derangement. The child becomes pale, feeble, and fretful, and does not thrive. Sometimes, however, the appetite remains good, and although the child suffers frequent and very severe attacks during a period of two or three months, yet no inroads appear to be made on its general health, and it goes on thriving, as if it were in every respect perfectly healthy. This is most apt to occur in those instances, where the paroxysms of colic recur at regular intervals, or in a periodical manner. This form of the complaint, is seldom connected with any decided manifestations of indigestion; and instead of being attended with loose and griping stools, it is very generally accompanied by constipation or slowness in the action of the bowels. Dr. Dewees states, that the paroxysms, usually, occur between four and six o'clock in the afternoon; but in this respect, I have not noticed any particular uniformity in the cases that have come under my own observation. I have known the attack to occur, regularly at a particular period in the forenoon; and I have recently prescribed for a case in which the paroxysms, uniformly came on between one and two o'clock every night.

There evidently exists a very material difference between these periodical cases, and the ordinary irregular form of the complaint. The latter appear to depend on a dyspeptic condition of the alimentary canal, and are manifestly greatly under the influence of diet and other causes capable of producing weakness or irritation

of the digestive organs. The immediate cause of the colic pains, in the majority of cases, appears to consist in violent flatulent distention and irritation of some portion of the bowels. That this is the case seems very obvious from the drum-like distention of the abdomen which usually occurs during the paroxysm, and from the relief which almost always follows the free discharge of wind from the bowels. The foundation for this painful affection is frequently laid during the first two or three days after birth. The extremely reprehensible practice of filling the infant's stomach with artificial food immediately after birth, before nature furnishes the appropriate nourishment, is, I am persuaded, a very common source of this distressing complaint. The child's stomach is thus often, in the very beginning of life, thrown into a state of irritation and feebleness—so that even the congenial nutriment afforded by the maternal breasts, will pass into the bowels in an imperfectly digested state, and give rise to acid and flatulent distention of the intestines. The exhibition of active purgatives, for the removal of the meconium, also, is well calculated to originate this complaint. After the digestive organs have once been brought into a state of irritation or functional derangement, the mildest and most appropriate nourishment, will not be properly digested; and this state of things must almost necessarily continue until the digestive energies have acquired a considerable degree of development; for the acid and flatus which are generated in consequence of the weakened condition of the stomach tend continually to keep up the deranged state of the digestive functions. Thus when the delicate stomach of the new-born infant is overloaded with any of the usual alimentary preparations, it can scarcely escape being, in some degree, weakened and irritated. The very first nourishment which the child afterwards draws from its mother's breast, will, probably, not be duly digested. Acid and wind will, therefore, be generated. These morbid products become additional causes of irritation and disorder of the digestive organs; and thus the complaint, generating as it were its own cause, may go on, for many months, however mild and fitting the nourishment may be. I know from repeated experience, that infants who receive no aliment, or only small portions of suitable nutrient fluids, until the appropriate nourishment is supplied by the maternal

breasts, will, in general, be much less liable to colic and griping pains, during the first two or three months of infancy, than such as are gorged with food, in the usual way, soon after birth. When the digestive organs are thus early disordered, the colic pains usually commence within three or four days after birth. The stools become frequent, green, watery, or curdled, and very painful, and in most cases, aphthæ supervene, before the end of the second week. In general, errors in diet, constitute the ordinary source of the colic, and griping in infants. Overdistention of the stomach, especially with artificial food; or administering nourishment at such short intervals that the stomach is constantly kept in a state of repletion and exercise, is particularly apt to give rise to these harassing complaints. Even the most appropriate articles of food, will not prevent the occurrence of colic and griping, if they are very frequently and superabundantly administered, so as to deprive the digestive organs of the requisite and regular intervals of rest. Not unfrequently, very painful disturbance of the alimentary canal, arises from a bad state of the mother's or nurse's milk. Mental disturbance in the nurse sometimes exerts the most extraordinary influence in this respect, by the changes which it causes in her milk. A few years ago, I met with a very striking instance of this kind. I was called to an infant about five months old, extremely harassed with colic pains. Most violent and protracted paroxysms of screaming and agitation occurred, three or four times daily. Its bowels were disordered, and frequent ejections of acid, fluid mixed with coagula of milk, took place from the stomach. The child was nourished exclusively at its mother's breast. I was told that these attacks first came on, about two weeks before I saw the little patient, and soon after the mother had unexpectedly heard of the sudden death of her husband at sea. Previous to this distressing occurrence, the infant appeared to be perfectly healthy. I advised immediate weaning, and the use of two parts of cow's milk with one part of warm water, for its nourishment. In less than twenty-four hours after the child was put on the exclusive use of this food, it was almost entirely freed from its painful attacks; and in a few days more, appeared to be as well as it was, previous to the first accession of the complaint. The children of nervous, fretful, and ill-tempered

women are much more liable to colic and other forms of gastro intestinal disorder, than those of placid and equanimous mothers. Protracted grief, sorrow, or despondency in the nurse, often gives rise to very severe and continued colic pains in the suckling, which nothing but weaning or a change of the nurse is capable of preventing.

Even physical pain in the nurse, when long-continued and harassing—such as tooth-ach and neuralgia, may occasion very obstinate and severe disorder of the alimentary canal in the nursling. Dr. Dewees relates a very curious instance of this kind. In the second week after birth, the child began to experience moderate attacks of colic; which gradually increased, in violence and frequency, until they became extremely severe and protracted. No relief could be obtained, except from laudanum, given "in large and constantly increasing doses." The fluid thrown from the stomach was sour; and the alvine evacuations were griping, thin, and often green. There was much emaciation. "In this situation did things continue, until the child was five months old, by which time it was (without a figure) nothing but skin and bone." In one of his visits the Doctor noticed the mother applying her hand very suddenly to her face and pressing it firmly. On being asked the cause of her doing so, she stated that she had been for a long time much tormented with tooth-ach. The Doctor advised her to have the tooth immediately extracted. "This was accordingly done; and from that day the child began to recover, and in a short time was perfectly restored to health."

Inattention to proper dietetic regulations, and consequent disorder of the digestive functions, on the part of the mother or nurse, may also give rise to such alterations in the milk, as will occasion colic pains and griping in the infant. Under the head of weaning, several other circumstances, in relation to the mother have already been mentioned, as sources of more or less serious disturbance in the stomach and bowels of infants. Of these a deficiency in the quantity of milk furnished by the breasts is a very common indirect cause of this painful affection in infants. To supply this deficiency, artificial nourishment must, of course, be resorted to: and in doing so, the child's stomach is apt to be overloaded with inappropriate articles of food.

Colic pains and griping may also proceed from the influence of cold—particularly from inattention to proper changes of the child's wet and cold linen, and from insufficient clothing and warmth about the abdomen and inferior extremities.

It has already been observed above, that the periodical form of this complaint, appears to differ very materially both in its character and mode of origin, from the ordinary cases of irregular flatulent colic. It is seldom associated with a dyspeptic condition of the digestive organs; and the beneficial influence of dietetic regulations, is certainly much less obvious in cases of this kind, than in the usual instances of the complaint; nor are those remedies which are generally relied on for preventing the generation of acid and wind in the primæ viæ, or for removing them, capable of procuring any decided advantage in these periodical cases. These attacks continue to recur regularly, for several months; their recurrence usually ceasing spontaneously, "as soon as the child reaches the age of three months." Dr. Dewees thinks that cases of this kind, depend, probably, "upon some constitutional peculiarity, over which we have but a temporary control." It appears to me likely that they do not differ from the gastralgia of adults —a form of neuralgic affection, which frequently assumes a periodical character, and which, like the present complaint, can seldom be materially influenced by the ordinary remedies for colic and griping pains. The attack in cases of this kind, generally comes on suddenly, and after having continued with occasional transient remissions for an indefinite period, varying from a few minutes to one or even two hours, it ceases as abruptly as it came on. From a close attention to several instances of this form of the complaint, I have been led to suspect that the pain, in such cases, is generally seated exclusively in the stomach. The pain is not aggravated by taking food or drink into the stomach; and in one instance, which came under my notice, the sufferings were almost always obviously mitigated, by administering a few teaspoonfuls of thin arrow root, barley water, or of a mixture of milk and water. During the attack there is usually a good deal of flatulent noise in the abdomen, attended with epigastric distention, and eructations of air, which, however, possess neither acidity nor fetor. The digestion is nearly always good, and sometimes

even more rapid than in a perfectly healthy condition of the stomach and bowels.

The colic of infants, as has already been observed, is by no means a dangerous, though always an extremely distressing affection. Nevertheless when the flatulent distention becomes very great, it may so weaken the muscular coat of a portion of the intestines, as to give rise, ultimately, to habitual costiveness of a very troublesome and unmanageable character. In some cases a highly irritated or sub-inflammatory condition of the mucous membrane of the bowels is excited in the progress of the disease, giving rise to painful and exhausting diarrhœa, a hard and tumid state of the abdomen, derangement of the digestive functions, and a general irritable and irritated condition of the sanguiferous and nervous systems. These consequences, however, rarely ensue, except where errors in diet are habitually committed, or where harsh and irritating purgatives and other medicines are frequently employed.

Treatment.—In the ordinary cases of infantile colic, associated with derangement of the digestive functions, or with habitual acidity and flatulency of the primæ viæ, judicious dietetic regulations are all-important remedial measures,—without which the most appropriate remedies will, at most, procure but temporary palliation. When there is reason for believing that the mother's milk is unwholesome, an effort should be made to ascertain the cause of its faulty condition, which may, perhaps consist in habitual improprieties in diet, or in some accidental and removeable disorder on the part of the mother. Should the first be the case, proper dietetic measures should be immediately adopted by the mother or nurse, and every thing that tends to promote the generation of acid in the alimentary canal carefully avoided. If, notwithstanding a judicious regulation of the mother's diet, the infant continues to be harassed with frequent attacks of colic, some advantage may occasionally be obtained by applying it to the breast at long intervals, and substituting small portions of suitable artificial nourishment—such as very thin arrow-root, barley water, or a mixture of equal parts of cow's milk and water. When the child has been partly nourished by artificial food, in consequence of a deficient secretion of milk, we may sometimes derive much benefit from a

change of the artificial portion of nourishment. A striking instance of the advantage that may occasionally be obtained in this way came under my observation a few weeks ago. The infant about two months old was almost constantly in a state of alarming torment. The mother did not furnish sufficient milk for its sustenance, and it was regularly fed with a mixture of equal parts of cow's milk and water. Arrow-root, barley-water, tapioca, and sago, in suitable preparations were successively tried, but without the least benefit. A mixture of weak chicken-tea and a very thin preparation of arrow-root, in the proportion of one part of the former to two parts of the latter, was finally resorted to. By the use of this nourishment, the complaint was soon very obviously mitigated; and under the additional influence of small doses of magnesia and powdered valerian, yielded almost entirely in the course of nine or ten days. As the error often consists more in the *excess*, than in the quality of the food, particular attention ought always to be paid to this point.

Infants who are partly nourished by artificial food, are particularly liable to be injured by over-feeding. I have repeatedly known great benefit derived from a mere reduction of the quantity of nourishment habitually taken by the infant—and particularly by lengthening the intervals between the meals so as to avoid the injurious practice of taking fresh food into the stomach before that which was previously taken has been fully digested and passed into the intestines. There are but few cases of flatulent colic that may not, in some degree be benefited by a judicious management of the diet. Frequently, however, the relief obtained from measures of this kind is but small, and recourse must be had to other means for correcting the disordered condition of the stomach and bowels, and especially to temporary *palliatives* for mitigating the violence of the attacks.

Magnesia by its antacid and purgative effects, is one of the most useful remedies we possess for the management of this complaint. When there is a prevailing tendency to generate acid in the primæ viæ, small doses of this article, given two or three times daily, almost always produce an obvious abatement in the frequency and violence of the attacks. I have generally given it in union with small portions of powdered valerian root, and when

the bowels are torpid, with the addition of a few grains of rhubarb. Three grains of magnesia, with two grains of powdered valerian, may be given twice or thrice daily, until the acidity in the stomach is removed. If this do not keep up a sufficient action of the bowels, the proportion of magnesia should be occasionally, increased, or a few grains of rhubarb added to the powders. Valerian is an excellent auxiliary to the magnesia, in cases attended with weakness of the digestive powers. I have used a solution of the bi-carbonate of soda in an infusion of valerian root, with very obvious benefit, in cases attended with much acidity. Twenty grains of the bi-carbonate of soda may be dissolved in two ounces of valerian infusion,* to which two or three drachms of ginger syrup may be added. A teaspoonful of this solution may be given several times daily, to an infant of from one to three months old. With the view of invigorating the digestive organs, and thereby impeding the formation of acid and flatus in the alimentary canal, small doses of a very weak infusion of colomba or of quassia may be resorted to with a prospect of considerable advantage, in cases associated with general feebleness and relaxation and a dyspeptic condition of the stomach. When the complaint is accompanied by thin, green and acid diarrhœal discharges, some advantage may be gained from the occasional administration of very small doses of calomel, either by itself or in union with minute portions of ipecacuanna. A frequent employment of this article, however,—particularly when given in full doses, is by no means advisable. Some years ago, I administered, in several cases of this complaint attended with constant acidity, flatulency, and diarrhœa, a mixture composed of five grains of prepared chalk, three grains of the powdered root of simplocarpus fœtida (*skunk cabbage*) and two of rhubarb, every morning and evening for five or six days in succession, with unequivocal benefit. The difficulty of procuring the powdered skunk cabbage in our shops, has since that time, prevented me from giving it again; though I am inclined to believe, that it possesses very excellent powers, both as a palliative, and as a means for invigorating

* The infusion should be made by macerating one ounce of the valerian root in a pint of warm water, for about twenty-four hours.

the depressed digestive energies of the stomach. When costiveness prevails, this article may be given in union with magnesia, in the way mentioned above, or with valerian.

In cases attended with frequent watery, green, or curdled and sour stools, accompanied with violent griping, antimonial emetics are strongly recommended by Armstrong. When the abdomen is not tender to pressure, and the little patient is free from febrile irritation, an occasional emetic dose of antimonial wine, followed by suitable doses of Dover's powder, will sometimes do much good in such cases. An instance of the usefulness of this practice, came under my notice about six months ago. The infant, about five months old, was extremely harassed with frequent small diarrhœal discharges of a watery and grass-green character; and each evacuation was preceded by excessively severe and protracted griping, as was evident from the child's vehement and unappeasable screaming. An antimonial vomit was given in the morning, followed after its operation by a grain and a half of Dover's powder. The disease was manifestly mitigated by these remedies; and by repeating them three times in the course of about a week, and employing, afterwards, small doses of prepared chalk and Dover's powder, in conjunction with the occasional application of rubefacient embrocations to the abdomen, the bowels were brought to a pretty healthy condition, and the little patient freed of his sufferings. In general, however, emetics are not appropriate remedies in infantile colic, except in cases where the morbid excitement is concentrated on the large intestines, and the stomach is in a languid or inactive condition. As a mere palliative, an emetic dose of *ipecacuanna*, will sometimes procure considerable relief when administered during, or at the commencement of the paroxysm, by expelling the wind and thus removing the distressing distentions of the stomach and duodenum. A repetition of emetics, however, could hardly fail, in the ordinary cases of the complaint, to disorder the digestive functions, and to favor the occurrence of inflammatory irritation in the stomach and bowels. The application of a large warm poultice over the abdomen, having previously rubbed the skin with hartshorn liniment, or, with the common camphorated mixture, will often assist materially in subduing the complaint, when it is accompanied with much intestinal

irritation, manifested by frequent small, thin and acrid or very fœtid evacuations.

As a temporary palliative for lessening the violence and duration of the attacks, Dr. Dewees, relies chiefly on the following mixture,*—which, he asserts "rarely fails to give instant relief, and sometimes even effects an entire cure." Twenty drops of this mixture should be given when the child is in pain, "and if not relieved in half an hour, ten drops more are to be administered." I have found this remedy, to procure prompt relief in some instances, but it has not been so uniformly beneficial, in my hands as the following preparation. Dissolve one drachm of camphor in an ounce of sulphuric æther. Take thirty drops of the solution, twenty grains of magnesia, six drops of laudanum, and mix them together with an ounce of fennel-seed tea. Of this mixture a teaspoonful may be given, to an infant from two to six weeks old; and if sufficient relief be not obtained in half an hour, about half a teaspoonful more should be administered. I have frequently procured prompt relief by administering two or three drops of the simple ethereal solution of camphor, in a teaspoonful of sweetened water, and I am satisfied that we have not a more efficient palliative, for relieving the distressing pains attending this complaint. When remedies of this kind must be frequently employed, camphor is, in some respects preferable to opium, unless diarrhœa and much intestinal irritation be present, in which case opiates in some shape or other can hardly be entirely dispensed with. In cases associated with diarrhœa and griping, the camphor may be advantageously given in union with laudanum. Two drops of the solution of camphor with half a drop of laudanum may be given three or four times in the course of a day, when the pains are violent and of protracted duration.

Gentle frictions with dry flannel or with the bare hand over the epigastric and umbilical regions, sometimes aids considerably in procuring the expulsion of the confined flatus. The introduction into the rectum, of a soap suppository during the colic attack, frequently produces copious discharges of wind and fæces, with great relief to the little sufferer. When costiveness prevails, lax-

* ℞. Magnes. calcinat. ℈i. Tinct. assafœtidæ gtt. lx. Tinct. opii. gtt. xx. Aq. fontan. ℥i. M.

ative enemata, with the addition of twenty or thirty drops of tincture of assafœtida, are appropriate and often very efficient means of temporary relief.

In the periodical form of the disease, dietetic regulations rarely afford any decided advantage. The diet should nevertheless be carefully attended to; for there can be no question as to the injurious tendency of errors in this respect. The abovenamed palliatives may be resorted to with temporary benefit; but the relief obtained by remedies of this kind, is seldom so prompt and considerable in the present as in the common irregular form of the complaint. When employed at all, they ought to be given, "the instant the paroxysm is about to commence;" for when the colic is once fully developed, it very rarely yields in any obvious degree, to remedies of this character. The only article that I have found, capable of occasionally producing a decidedly favorable effect, is a few drops of the spirits of turpentine in a teaspoonful of good sweet oil, or milk. In some instances I have known this remedy to effect a speedy subsidence of the pains in this variety of the disease. From three to six drops of the turpentine may be given to a child of from one to three months old, and the dose may be repeated in the course of an hour without the least risk of injury. Viewing it as a strictly periodical complaint, Dr. Dewees has administered a decoction of the bark during the intervals of the attacks, and, as he informs us, "with the happiest effect in several instances." Formerly I employed the prussiate of iron in several cases of this kind; and in one instance, the effects of this remedy were surprisingly beneficial. To an infant between one and three months old, a half a grain of this article may be given every three or four hours during the intervals of the paroxysms. In the successful case just referred to, this preparation of iron was given in union with powdered valerian. The infant was about two months old. A violent attack of colic occurred about six o'clock, every evening, and generally continued for nearly an hour. The child had been affected with the complaint for upwards of three weeks before I saw it. After the bowels were freely evacuated by a dose of a few drops of syrup of rhubarb, I prescribed half a grain of the prussiate of iron with three grains of powdered valerian root to be taken every three

hours during the intermission. The first paroxysm after these powders were taken, was perhaps, as severe as any of the preceding ones. The medicine was, however, continued, during the next intermission; and now, the attacks gradually subsided in violence and duration, until, at the end of eight or ten days, the child was almost entirely freed of the complaint. I have, since this case, employed the same combination in another instance; but the effects, though not without obvious advantage, were by no means so promptly and decidedly beneficial as in the former instance. As the bowels are generally torpid in these cases, mild laxatives, must be used from time to time, to keep up the requisite alvine evacuations. Active purging, however, is not only useless, but often decidedly injurious—a fact which I have, in several instances, seen strikingly verified. It would, I think, in general be better to procure the necessary evacuations by laxative enemata, than by aperients taken into the stomach. If the latter be preferred, fresh cold-pressed castor oil, and syrup of rhubarb, are the most appropriate.

The practice, so common with mothers and nurses, of administering various irritating substances of an anodyne or carminative character, is often carried to a highly injurious extent, and cannot be too severely censured. The habitual use of opiates in infantile colic, almost always leads to very unfavorable, and often to very distressing and dangerous consequences. In order to obtain the requisite degree of anodyne effect, the dose must be progressively increased; and thus a habit is soon formed, which renders the discontinuance of the anodyne a source of inexpressible distress and inquietude, whilst its continuance, in increasing doses never, fails to operate perniciously on the whole organization.

Under the habitual use of these treacherous palliatives, constipation soon ensues; the appetite and digestive powers fail: the body emaciates and the skin becomes sallow, dingy, and shrivelled; the countenance acquires an expression of languor and suffering, and a general state of apathy, inactivity and feebleness ensues, which, ultimately, often leads to convulsions, dropsy of the head, glandular indurations, incurable jaundice, or fatal exhaustion of the vital energies. The more immediate effects of opiates, also, are frequently extremely unpleasant, particularly in very young infants.

The pain may indeed be lulled by the anodyne, but though quieted, the infant is evidently under the influence of highly disagreeable sensations, as is manifested by the sudden startings, unnatural whining cry, and the exceedingly irregular respiration, being now very hurried for a moment, and then slow and moaning with occasional intermissions, of so protracted a duration, that "one would think the breathing had ceased altogether." All the usual soothing mixtures, such as Godfrey's cordial and Dalby's carminative, so much employed for allaying the colic pains, and griping of infants, contain more or less opium; and innumerable infants have been irretrievably injured by the habitual use of these popular nostrums.

Heating and irritating articles, such as diluted spirits, infusion of spicy and aromatic substances, soot, and repeated active purgatives may do much injury, by irritating the delicate mucous membrane of the stomach and bowels, impairing the digestive powers, and finally exciting a state of chronic inflammation in this structure, which it is always very difficult, and often impossible to remove by any subsequent care and management. The observations are addressed rather to mothers and nurses than to physicians; for it cannot be questioned that all these remedies, more especially opiates, may, by judicious management be beneficially employed in certain instances and conditions of the complaint.

CHAPTER XVIII.

OF CONSTIPATION.

Torpor of the bowels, and consequent costiveness, of more or less protracted duration, is of frequent occurrence among infants. In some instances, the bowels are habitually so very inactive, that scarcely any alvine evacuations take place, except when excited by artificial means. This state of the bowels is the result either of a constitutional habit, or of accidental causes. The former variety of costiveness is very rarely attended with unpleasant consequences, "and indeed children of such a habit of body are frequently the most thriving" (Underwood). Dr. Dewees observes, that a period of from two to ten days may intervene between the stools, in constitutional costiveness, "without the child receiving the least injury from this torpor of the bowels." I have repeatedly met with instances, where not more than two or three evacuations took place in the course of a week, without the slightest inconvenience to the infant; and Dr. Dewees mentions a case, where the stools occurred "but once in eight or ten days," for a long period, although the infant throve well and appeared to be "in excellent health." Mothers, generally, express much solicitude, in cases of this kind; and under the apprehension of evil consequences from this condition, frequently urge the administration of aperients to a very injurious extent. When the infant manifests no symptoms of ill-health, and continues to thrive well, constitutional costiveness very seldom requires any remedial interference, "though it will be prudent carefully to watch it." Where there is a tendency to convulsive affections—a tendency which is sometimes manifested in children of a perfectly healthy and robust appearance, it will undoubtedly be advisable to obviate protracted costiveness by the occasional administration of suitable aperients; for, "fine lusty infants are sometimes seized with vio-

lent convulsive fits, without any other apparent cause, than a naturally costive state of the bowels, and as uniformly recovered from the fits, merely by procuring stools and breaking off the wind" (Underwood). During dentition, also, it will, in general, be expedient to increase the frequency of the alvine evacuations, by artificial means, where there is much intestinal inactivity. The most suitable aperients, in cases of this kind, are castor oil, manna, and magnesia. I have for many years past, been in the habit of prescribing the following mixture for this purpose. It is certain, and peculiarly mild in its operation, and of so pleasant a taste that children generally take it with little or no reluctance.

℞. Ol. Ricini	- -	℥ i
Magnesiæ calcinat.		ʒ ii
Sacchar. Albi,	- -	ʒ iii
Ol. Anise,	- -	gtt. ii

Mix them intimately, by rubbing them together in a mortar.

One or two teaspoonfuls of this mixture may be given at a dose. During the first two or three months of infancy, we may, in general, keep the bowels sufficiently soluble by the use of manna—an article which is, perhaps, less apt to disagree with the stomach or to cause unpleasant effects in the alimentary canal of infants, than any other aperient we possess. It should be dissolved with warm water, to the consistence of a thick syrup, and given in teaspoonful doses.

Costiveness from accidental causes is a very common affection during infancy. Instances of this kind are, properly, morbid conditions, and can seldom be entirely neglected without incurring some risk of injurious consequences. A torpid state of the bowels may occur as a symptom of some obscure deviation from health. If it be not removed it may become an additional source of irritation in the system, and aggravate the latent disorder upon which it depends. Thus a preternatural determination of blood to the brain, may give rise to inactivity of the bowels, without any other obvious signs of ill-health, or disordered function. The costiveness, if it be suffered to continue, will hardly fail to increase the already preternatural determination of blood to the head, and thus a very serious affection may ultimately be developed in the brain or the alimentary canal, which might have been obviated by a judicious course of aperient remedies. The occurrence of costiveness dur-

ing dentition, may always be regarded as an unfavorable event. Children almost always suffer much more general irritation, and incur much more risk of convulsions and other dangerous affections from dentition, when the bowels become torpid and constipated, than when they are moderately loose during this process.

The very reprehensible, and frequently clandestine practice, among nurses of giving opiates to infants, to make them sleep, that they may not require much attention during the night, is a frequent source of obstinate and injurious costiveness.* I met with a remarkable instance of this kind a few years ago. The infant, when about two months old became very costive. Aperients were from time to time, resorted to, but the torpor of the bowels continued, and gradually increased, until no evacuations could be procured except by large doses of the most active purgatives. The child became sickly, and much harassed with acidity and flatulent pains in the stomach. After I had for nearly a month endeavored to bring the bowels into a more regular condition, without the slightest advantage, it was accidentally ascertained that the nurse had been in the habit of giving the infant a dose of laudanum every evening to the extent of at last ten or twelve drops at once. The laudanum was now gradually withheld, and in about two weeks the child's bowels were restored to their former regular state, although its general health continued to be very infirm for several months afterwards.

Costiveness may also occur, as a consequence of particular articles of nourishment. Children who are chiefly nourished by pap, or by preparations of rice, are apt to become more or less constipated; and in general, all the usual farinaceous articles of nourishment have a greater tendency to produce costiveness, than milk and the nutrient animal fluids. In some instances, though rarely, the mother's or nurse's milk, has a constipating effect on the child's bowels: but this, probably, depends more frequently on a peculiar constitutional habit

* "Nurses," says Dr. Dewees, "are now so familiar with this drug (laudanum) that it is as regularly carried about them as their scissors or thimble, and is much more indispensable to their comfort than either of those emblems of industry. If the child does not go to sleep, or if it is even feared it will not, at the exact moment which will suit the arrangements of the nurse; or if it cry from any cause, so as to give any additional trouble, laudanum is given to make 'assurance doubly sure.'"

on the part of the child, than on the particular qualities of the milk. This was certainly the case in one instance which came under my notice some years ago. The mother, with an abundance of milk, suckled her twin infants, and treated them in every respect precisely alike. One of them was constantly costive, except when nourished principally with cow's milk; whilst the other child was uniformly regular in its bowels. When children are observed to become costive, and to continue so under the use of any particular kind of nourishment, an immediate change of food should be made; for a nourishment which is capable of producing this effect, will, in conjunction with the costiveness it has caused, be likely to occasion more serious disturbances in the system if its use be persisted in.

Accidental costiveness is usually attended with flatulency and occasional attacks of colic pains. If it be suffered to continue, it may ultimately give rise to inflammatory irritation of the mucous membrane of the bowels, which may manifest itself either by obstinate and painful diarrhœa, or swelling, tension and soreness of the abdomen, or finally, by various sympathetic affections of the head, chest or the general system.

The aperients already mentioned, will in general procure all advantages that can be derived from remedies of this kind. Cold-pressed castor oil, is an excellent laxative in the ordinary cases of costiveness. When the alvine discharges manifest a deficiency of bile—that is, when they are whitish or clay-colored, much benefit may be obtained, from the occasional administration of a small dose of calomel in the evening, followed next morning, by one or two teaspoonfuls of castor oil. Magnesia is the appropriate laxative when the intestinal torpor is accompanied with acidity in the primæ viæ. In moderate cases of constipation, relief may frequently be obtained from the daily introduction of a soap suppository into the anus. Laxative enemata also, may be advantageously employed in cases of this kind. They are especially useful, as occasional substitutes for the internal aperients, where the necessity of resorting to artifical means for moving the bowels continues a long time; for a long-continued and frequent employment of even the mildest laxatives, is apt to injure the digestive functions, and to give rise to some degree of intestinal irritation. When the

abdomen is free from tenderness or soreness to pressure, frictions and gentle kneading of the abdomen with the hand, sometimes produces an excellent effect, both in constitutional and accidental colic.

CHAPTER XIX.

OF VOMITING.

Vomiting occurs more frequently, and, in general, with much less unpleasant consequences during early infancy, than at any other period of life. We often see perfectly healthy infants, who are in the habit of throwing off a portion of the contents of the stomach, several times daily, without sustaining the least disagreeable consequences from it, whatever. The vomiting in these cases arises solely from an overloaded condition of the stomach, and is not attended either by nausea, or by any strong and disagreeable vomitive efforts. It seems to be almost entirely effected by a sudden momentary contraction of the stomach, with little or no aid from the abdominal muscles and diaphragm. This harmless kind of vomiting is particularly apt to occur, in robust infants who are nourished at exuberant breasts; and it seldom happens except immediately after the infant has sucked. The milk is generally thrown off, in an unchanged condition; and the infant is so little annoyed by the vomiting that it will often preserve its usual placid and cheerful countenance, whilst the milk is regurgitating from its stomach. This variety of vomiting may therefore be regarded, rather as a salutary than a morbid occurrence; for the superabundant nourishment with which the digestive organs are habitually overloaded, would, doubtless, soon give rise to indigestion and its various disagreeable consequences, if the stomach did not regularly relieve itself by throwing off a portion of its oppressive load. So long as the infant remains healthy, and the ejections

are, manifestly, mere efforts of the stomach to relieve itself of its over-distended condition, nothing ought to be done, in the way of remedial applications, to prevent the vomiting. Nevertheless, these efforts of the stomach to relieve itself, though obviously salutary, show, that the infant is habitually going beyond the proper limits of moderation in its nourishment; and as a frequent repetition of this error, however transient in its influence, may ultimately weaken the tone of the digestive organs or establish a habit of immoderate indulgence in eating, it will always be proper, to endeavor to obviate the cause of the vomiting—namely the over-repletion of the stomach, by preventing the infant from taking too much nourishment at a time. With this view, "the child should be taken from the breast, the moment it begins to dally with it, or as soon as it ceases to draw as if it were really gratifying a necessary and proper appetite." When the infant has satisfied its appetite, it ought not to be immediately jolted and dandled, but suffered to remain perfectly at rest, for at least thirty minutes, after it has been taken from the breast. The common practice of tossing and jolting infants immediately after they have taken nourishment is highly improper. In cases of the kind now under consideration—where the stomach is usually charged to the utmost of its capacity at each nursing, this practice is particularly objectionable, as it rarely fails to excite vomiting and interfere with the regular progress of digestion. If the child is kept in a state of quietude after its removal from the breast, and the quantity of its nourishment somewhat diminished, in the way just mentioned, the habit of vomiting soon after the reception of its food, may almost always be effectually overcome. The mere cessation of this inconvenience, however, is not the only advantage which may be expected from these measures. Infants who are in the habit of vomiting after sucking, from mere over-distention of the stomach, are peculiarly apt, at a subsequent period, to become affected with habitual torpor of the bowels or costiveness. I have repeatedly noticed this connection between vomiting from repletion during the early period of infancy, and habitual costiveness at a more advanced age. It would seem as if the excitability of the alimentary canal became, in a manner concentrated in the stomach. This consequence might, doubtless, be, in a great measure, obviated, by constant attention

to a suitable moderation in the infant's nourishment. This is the only mode by which we may prudently attempt to prevent the recurrence of this kind of vomiting. All efforts to obviate the vomiting by medicinal agents, must not only prove abortive, so long as the infant is permitted to fill its stomach to excess, but often decidedly injurious, and should never be attempted in cases of this kind.

Morbid Vomiting may be excited by injurious or offensive substances lodged in the stomach, or occur as a symptom of some local or general affection of the body. Underwood says, that troublesome vomiting sometimes occurs in consequence of a "suppression of the discharge behind the ears; and from the sudden disappearance of some eruption on the skin." Dr. Dewees, however, doubts whether vomiting ever occurs as a direct consequence of these causes. "We have never witnessed it," he says "from either of these causes." That such cases do occur, I have had unequivocal evidence. I attended a child within the present year, affected with frequent vomiting, which was manifestly connected with an excoriation and occasional serous discharge behind both its ears. It was observed, that whenever there was a discharge from these sores, the child was free from vomiting and appeared well; but as soon as the serous discharge ceased, which it occasionally did without any obvious cause, the little patient became pale, sickly, and vomited five or six times daily. The infant was about eighteen months old. When I first saw it, there had been no discharge for five or six days. The parts were perfectly dry and scurfy. The child was pale, and threw up almost every thing it took into its stomach. I applied blisters behind the ears and on the following day no vomiting occurred. By the occasional application of blisters, and the use of equal parts of *lac sulphuris* and *magnesia*, the child finally regained a good state of health. This is the only case of this kind, I have met with.

Dentition is sometimes attended with a very irritable state of the stomach giving rise to frequent vomiting. This probably depends on an extension of the irritation from the mouth to the brain, causing a kind of erithism of this organ—a condition which is almost invariably associated with an irritable stomach and a

strong disposition to vomit. The best means for checking this species of vomiting are, blisters applied behind the ears, or on the back of the neck; dividing the gums down to the advancing teeth; warm pediluvium; purgatives, or purgative enemata; and small doses of laudanum.

Vomiting is sometimes excited by a bad condition in the nurse's milk. When it arises from this cause, the child generally throws up the milk almost as soon as it is done sucking. We may readily satisfy ourselves, whether it depends upon this cause, by putting the infant upon the use of some other suitable nourishment, or suffering it to suckle another nurse. If no vomiting occurs after such a change of its nourishment, the source of the evil is manifest, and a permanent change must be adopted, unless the vomiting be but trifling.

One of the most frequent sources of vomiting, however, is a dyspeptic state of the stomach, occasioned by improper articles of nourishment, or immoderate feeding. These cases are generally attended with a prevailing acidity in the primæ viæ. The milk is thrown up in dense coagula, and has an acid smell; the child is troubled with flatulency, acid eructations, and the stools are, usually green, more or less griping, and sometimes diarrhœal. In some instances however, the bowels are torpid, and the child experiences occasional attacks of slight colic pains. In these cases the milk or food is seldom thrown up, until it has lain some time in the stomach. Dr. Dewees, observes that when the vomiting depends on an excess of acid, "the milk is thrown up in a few minutes after it has been received into the stomach." This does not accord with my own observations. I have seldom known vomiting to ensue in cases of this kind, until the milk had lain, at least, a quarter of an hour in the stomach, and, in many cases, the interval between receiving it and throwing it off again, is much longer. In such cases, the diet ought to be carefully regulated, and above all, moderation in the quantity of food taken, rigidly enjoined. If the child has been weaned, much benefit may sometimes be obtained by mixing its usual farinaceous nourishment or milk, with beef or chicken tea, or weak mutton broth. Equal parts of barley-water and chicken tea forms an excellent nourishment, where there is a strong tendency to acidity in the stom-

ach. To arrest the vomiting, lime-water, and milk, given in repeated doses, often produces an excellent effect, where the cause of the evil consists in a redundancy of acid in the primæ viæ. If costiveness or slowness of the bowels attend, small and frequent doses of calcined magnesia, are preferable; and I have occasionally administered the bi-carbonate of soda, dissolved in a very weak infusion of colomba with prompt and complete advantage in instances of this kind.

Acid is not, however, always present in cases of vomiting, depending on a deranged condition of the digestive organs. In some instances, there is a total deficiency of acid; the milk, coming up in a perfectly unchanged state, and wholly free from any acid smell. The vomiting in such cases, seldom takes place, until the nourishment has lain a considerable time in the stomach, and it is generally preceded by very obvious signs of nausea. The child's countenance becomes pale and expressive of great anxiety and distress, and in a moment the contents of the stomach are thrown with great force. In cases of this kind, a teaspoonful of good lisbon or maderia wine, given at proper intervals sometimes produces a very happy effect. A drop or two of nitric acid, in a little sweetened water, also forms an excellent remedy in such cases. Dr. Dewees, says that he has rarely failed procuring relief, in this condition of the stomach, "by the occasional exhibition of small quantities of lemonade." I have used a mixture of the *spiritus mendiriri* and lemon syrup, in several instances, with prompt and complete success. Three ounces of the former, with an ounce of the latter, forms a good mixture for this purpose. A teaspoonful of this may be given every half hour, or at remoter intervals according to the urgency of the case.

When the vomiting is excited by the presence of improper articles of nourishment in the stomach, the exhibition of a mild emetic will often prove decidedly beneficial. Four or five grains of ipecacuanna, may be given without the least risk of injury, and generally with much advantage. I have always preferred this article, to antimonial wine, in the gastric affections of infants when a remedy of this kind was deemed proper. It is much less apt to irritate the mucous membrane of the alimentary canal and to debilitate the system than antimony; and its secondary effects

are, in general, much more salutary, in cases attended with an irritable condition of the stomach, than those of the latter article. We may, however, frequently procure the entire evacuation of the offensive substances lodged in the stomach, in cases of this kind, simply by the exhibition of warm water, by which the vomiting is, at first, promoted, and the stomach freed of its offensive contents. If, after this has been effected, the vomiting does not cease, a few drops of laudanum or of camphorated spirit, given in a little milk, will generally prevent its recurrence.

We, however, often meet with cases of vomiting in infants, which are neither excited by an excess of acid, nor by improper articles of food nor by any other offensive substances lodged in the stomach, and for which, in fact, we can assign no other cause than that the stomach has, from some circumstance or other, become extremely irritable. In cases of this kind—that is, when the stomach is morbidly irritable and the matter thrown up, contains little or no acid, we may sometimes do much good by the administration of minute doses of calomel and ipecacuanna. I have repeatedly succeeded in arresting vomiting, from inordinate gastric irritability in infants, by exhibiting the eighth of a grain of calomel with the one sixth of a grain of ipecacuanna every hour or two, in conjunction with the application of a stimulating poultice or plaster over the epigastrium. The application of a poultice of this kind, is calculated to operate beneficially, whatever may be the cause of the vomiting. A teaspoonful of pulverized cloves, with the same quantity of black-pepper, formed into a poultice with crumbs of bread and water, will, in general, answer this purpose very well. A handful of dried mint, rubbed up and made into a poultice with meal or bread, forms, also, an excellent stimulating application in this condition of the stomach. With the exception of small doses of laudanum, internal stimulating remedies seldom procure more than very transient relief, and may readily occasion a great deal of mischief, where there is much irritability of the stomach. The occasional use of laxative enemata, will sometimes assist materially in such cases. When opiates are deemed proper, no preparation, I am inclined to think, is more suitable, in this state of the stomach, than the common paragoric tincture of the shops. All the purposes however, that

opium is capable of fulfilling may be fully obtained by applying it externally. One or two grains of morphia sprinkled on the surface of a small plaster of common cerate, and laid over the pit of the stomach, will procure a sufficient degree of narcotic influence. When the skin is broken, this article will operate as promptly, and with nearly the same degree of energy as if it had been received into the stomach.

CHAPTER XX.

OF DIARRHŒA.

Although by no means peculiar to infancy, diarrhœa is, unquestionably, by far more common during this early age, than at any other period of life. From the peculiarly susceptible and uninured state of the alimentary canal, and the general organic feebleness of infancy, it is, also, in general, much more apt to assume an unmanageable and dangerous character, at this period, than at a more advanced stage of childhood or adult age. In some instances, the diarrhœal discharge sare fæculent, and easily managed. In others, the stools consist principally of viscid mucus, streaked, occasionally, with a little blood. Sometimes the evacuations are conspicuously bilious. In other cases, the discharges present a white or milky appearance, accompanied with rapid emaciation and prostration; and in some instances they consist of a mixture of fæculent matter, mucus and imperfectly digested articles of food. Although *irritation* of the mucous membrane of the bowels, constitutes the immediate cause of the increased peristaltic action and consequent inordinate discharges, yet each of these modifications in the character and appearance of the evacuations, is essentially connected with peculiar pathological conditions, which it is of great practical importance to discriminate. It should be observed, however, that the simplest or fæculent variety of the disease, may, under improper manage-

ment or the continued operation of irritating causes pass into any of the other modifications—there being no essential difference between them, except what arises from the degree of inflammatory irritation—the portion of the bowels principally affected, and the extent to which the digestive powers, as well as the neighboring structures and organs become implicated in the disease. Thus, if there is simple irritation of the alimentary canal without much impairment of the digestive functions, the stools will be fæculent. If the *inflammatory* irritation is seated principally in the small intestines, and extends itself to the mesenteric glands, the discharges will probably be chylous. Should the irritation be severe, and chiefly located in the large intestines, the stools will be mucous: If the liver becomes unusually excited, bile will manifest itself in the evacuations; and when the stomach becomes very irritable and the digestive functions depressed portions of imperfectly digested food will pass off with the stools.

The exciting causes of diarrhœa are extremely various. Some of them act directly on the mucous membrane of the intestinal canal, whilst others affect the bowels, sympathetically, through the medium of the general nervous system. Of the former variety are all irritating substances received into, or generated in the alimentary canal; and of these, by far the most common are: irritating, crude, or inappropriate articles of food and drink; acrid and vitiated secretions from the liver and intestinal exhalents; worms, acid, fresh fruit,—particularly such as are very sweet &c. The foundation of diarrhœa, in infants, is often laid during the first twenty-four hours after birth. The habit of gorging the infant's stomach with alimentary fluids, previous to the secretion of its natural and congenial nourishment by the maternal breasts, often at once, produces a degree of gastric irritation and feebleness, which predisposes to the occurrence of diarrhœa, colic &c. from the slightest causes. Children who are entirely nourished at the breast, are much less apt to become affected with this complaint, than such as are partly nourished by artificial food. There exists, however, great diversity in relation to the effects of the same article of nourishment, in different individuals. Some infants are invariably purged, when fed with cow's milk,—even when considerably diluted with water. In

some children the ordinary preparations of arrow-root produce costiveness, whilst we occasionally find this article to give rise to much disturbance in the alimentary canal, and purging. This, however, is but seldom the case, its usual effects being rather of a constipating character. But it is not from the usual farinaceous and mucilagenous articles, that any particular mischief is to be apprehended in this respect. On the contrary, they are generally the most appropriate dietitic means for preventing and counteracting diarrhœal affections. It is only, when given to excess—when the stomach is habitually overloaded with them, that they are apt to give rise to disorder of the bowels. However mild and congenial the nourishment may be, it will be apt to give rise to weakness of the digestive powers, and purging, when taken in excessive quantities. Over distention of the stomach, by the immoderate reception of food, seldom, however, produces any immediate bad effects in this way. It is in general only, by degrees, that the tone of the stomach is thus impaired; and that it gives rise to intestinal irritation and purging. Infants who are fed with *solid* articles of food, seldom escape suffering more or less from diarrhœa. The practice of allowing potatoes, meat, pastry, dried fruit, and other articles of this kind, to infants, is peculiarly calculated to give rise to intestinal irritation, and all its disagreeable and alarming consequences. This injurious practice is seldom confined to the production of simple diarrhœa. It is apt, ultimately, to produce a slow form of inflammation in the mucous membrane of the bowels, terminating often in ulceration or incurable disorganization of this delicate structure. Chronic cases of diarrhœa, attended with general irritation and emaciation, are almost always connected with inflammation and structural lesion of the intestinal mucous membrane; and the majority of such instances are the result of errors in diet—particularly of crude and irritating articles of solid food.

In some instances, the mother's or nurse's milk, disagrees with the infant's stomach, and gives rise to troublesome vomiting, colic and *purging*. This does not always depend on any obvious ill-health, on the part of the mother or nurse. I have recently seen an instance of protracted diarrhœa, in an infant about six months old, which was nourished exclusively at the breast, and the mother

appeared, in every respect, perfectly healthy. The breast was withheld, and a mixture of cow's milk and water substituted for its nourishment, which had the effect of immediately putting a stop to the diarrhœal affection. The milk, in cases of this kind, is, doubtless, in most instances faulty; but it is probable that idiosyncracy, on the part of the infant, is sometimes the principal if not the exclusive source of the mischief, independent of any positive bad quality in the milk. When the milk disagrees with the infant's stomach, the usual consequences, in the first place, are vomiting, and acidity. The digestive functions soon become deranged, and the milk passing into the bowels, in an imperfectly digested state, together with the abundant acid usually generated, causes intestinal irritation and diarrhœa—the discharges exhibiting a curdled, stringy, yellow or green appearance. Cases of this kind, are generally attended with occasional paroxysms of severe colic pains; and the eructations and ejections from the stomach have a very acid smell. Irascible and passionate nurses, and such as are under the influence of some depressing mental emotion, are peculiarly apt to furnish milk of a bad and irritating quality, tending to produce diarrhœa, and other forms of intestinal disorder. The nourishment, too, which is taken by the nurse has a decided influence on the qualities of the milk, and consequently on the digestive organs of the nursling. The free use of salted meats by the nurse, has a tendency to render the milk acrid or offensive to the delicate digestive organs of the infant; and I have known very rapid diarrhœa to occur in consequence of a free indulgence in eating fresh fruit, particularly cherries, on the part of the nurse.

The influence of dentition on the alimentary canal is well known. Many infants are almost constantly affected with looseness of the bowels during this important process; and when the diarrhœal discharge is moderate, it may be regarded as decidedly salutary in its tendency, and ought not to be checked. It has been supposed that the immediate cause of the diarrhœa which often attends dentition, consists in an acrid condition of the saliva —in consequence of the irritation in the gums, extending to the salivary glands, and perverting their action. Some degree of gastric irritation may occasionally arise from this cause; but the

principal source of the complaint, appears to consist in a peculiarly irritable state of the alimentary canal, caused, by the dental irritation. The whole nervous system often becomes highly irritable during the process of dentition. The brain becomes remarkably excitable, manifesting in many instances, a decided state of erethism, and the whole organization acquires a preternatural susceptibility to the impressions of exciting causes. In this irritable condition of the intestinal canal, therefore, even the ordinary and appropriate kinds of nourishment, may give rise to irritation of the bowels and consequent diarrhœal discharges. The digestive functions may, moreover, suffer derangement from dentition, and favor the production of acid and other causes of intestinal irritation.

Cold, by suddenly checking the perspiration and determining the blood to the internal organs, frequently gives rise to bowel complaints in infants. Cold-bathing, or washing; suffering wet diapers, stockings, &c. to remain too long on the infant; setting or lying down on damp grass-plats, floors, steps, &c., passing suddenly from a close and warm room into the cold external air; and exposure to cold and humid weather without sufficient clothing—particularly about the abdomen—these are the ordinary ways in which diarrhœa, from the influence of cold, is produced in infants. Cases arising from this cause, are generally attended with slight catarrhal symptoms, more especially with cough; and some degree of febrile irritation almost invariably occurs. There is in general, a greater tendency to inflammation of the mucous membrane of the bowels, in cases of this kind, than in those produced by the other causes of the disease mentioned above. The skin is usually dry and harsh, and the discharges are commonly very liquid or watery, containing flocculi of mucus, with little or no bilious matter or acid.

Atmospheric Heat, also, is frequently concerned in the production of this complaint. Its tendency to excite and derange the functions of the liver is well known. The occurrence of bowel complaints among children, is incomparably more frequent during the hot months of summer, than in the colder seasons of the year. It is probable that the agency of solar heat in the production of

bowel complaints, depends as much on the miasmatic exhalations which it generates, as on its own direct operation on the animal system. It is certain that complaints of this kind, are vastly more common in situations favorable for the development of miasmata, than in localities not abounding in materials fitted for its generation. There can be no doubt, however, that high atmospheric temperature, by its direct influence on the system, is capable of giving rise to diarrhœal affections. There appears to subsist a direct relation between the liver and the skin; so that when the cutaneous exhalents are kept in a state of unusual action by the influence of atmospheric heat, the liver, acquires a corresponding degree of activity, giving rise to a copious secretion of bile. Hence bilious diarrhœa is most frequently met with during warm weather. In many cases of diarrhœa from this cause, however, there is but very little or no bile perceptibl in the evacuations. The liver, in such cases, is torpid and engorged with blood. This may arise from the alternate influence of high and low temperature. When the skin and liver are in a state of activity from atmospheric heat, the system is extremely susceptible to the impressions of low temperature. If an individual in this situation is exposed to the influence of cold or even cool air—as the cool night air after a warm day, the cutaneous exhalents and liver are suddenly rendered torpid. The blood, passes from the external to the internal organs, and the liver becomes at once greatly congested and torpid—a condition which is always attended with great irritability of the stomach and bowels. Cases resulting from these influences, seldom assume the character of simple diarrhœa. They generally occur in the forms of cholera or dysentery.

Fœculent Diarrhœa.—This is the simplest and in general the most manageable variety of diarrhœa. The evacuations are fæculent, resembling those which are produced by the operation of an active cathartic. The pathological condition of the bowels, in this modification of the complaint appears to consist in simple irritation, depending either on the presence of acrid and offensive substances lodged in the alimentary canal, or on increased irritability, in consequence of which the ordinary contents of the bowels excites excessive peristaltic action and con

sequent diarrhœa. When the diarrhœa, depends on the presence of acrid or offensive substances in the intestines, it frequently cures itself; for as soon as the irritating materials are evacuated, the inordinate action of the bowels, usually ceases, and the discharges assume their natural and healthy character. Perhaps the majority of instances of diarrhœa, are, in the first place, excited in this way:—that is, by irritating substances either introduced into the stomach from without, or generated in the intestinal canal, by fermentation, decomposition, and morbid secretions. Very frequently, however, cases, that commence in this way—the diarrhœa being at first similar to the purging excited by cathartics,—are soon associated with a morbidly irritable condition of the bowels; and when this occurs, a spontaneous cure can no longer be expected, since the mildest substances will cause irritation and inordinate peristaltic action. When the diarrhœal discharges continue for three or four days,—more especially after the operation of an efficient laxative, we may presume that the complaint no longer depends, mainly on the presence of acrid or irritating substances, but on a morbid change in the sensibility and irritabiltiy of the bowels. Cases of this kind, sometimes assume a very severe and intractable character, in consequence of the supervention of inflammatory irritation or of sub-acute inflammation in the intestinal mucous membrane. These cases are, however, rarely attended with fæculent discharges properly so called, and must be ranked with one of the subsequent varieties of the complaint.

The most common source of simple fæculent diarrhœa consists probably, in dietetic errors. When the stomach is overloaded with nourishment, or when the articles of food are crude, insoluble and of difficult digestion, more or less disorder of the alimentary canal is inevitable. If, after an error of this kind, the food is not soon rejected by the stomach, portions of it will pass into the bowels in an imperfectly digested state, and give rise either to severe colic, or to rapid and painful diarrhœa. If the error be not repeated, and a moderate and appropriate diet used, cases of this kind sometimes cease as soon as the offensive materials are evacuated. In general, however, the digestive powers, suffer more or less impairment from the irritating impressions and resist-

ance of the improper food; so that even the mildest and most congenial articles of nourishment may afterwards fail to be properly digested. When this happens, gastric disturbances and diarrhœa, of a protracted and obstinate character often occur, which can seldom be entirely removed without especial attention to the digestive organs. The diarrhœa which results from a bad or unwholesome condition of the mother's or nurse's milk, is always in the beginning fæculent, and generally remains so throughout its course—that is the digestive functions are impaired and the bowels in a state of simple irritation.

In some instances of fæculent diarrhœa, the exciting cause consists in a superabundance, or in a depraved condition of the biliary secretion. In cases of this kind, the evacuations are conspicuously mixed with bilious matter, sometimes of a dark, but more frequetly of a light green color. The appetite is often strong, but the digestive powers are almost always impaired.

Sickness of the stomach, and vomiting, occur much more frequently in this variety of diarrhœa, than in any other modifications of the complaint. This is more particularly the case, when the diarrhœa is excited by bad milk, or irritating and inappropriate articles of food. Nausea usually supervenes a short time after taking nourishment. This is soon followed by pain in the bowels, and more or less rapid purging. When the nausea is frequent and considerable, or when vomiting occurs often, we may presume, that the morbid state of the stomach manifested by these symptoms, constitutes the main pathological condition of the disease, and that it requires very especial attention in its remedial management. This disordered state of the stomach, appears to consist of simple irritation and weakness of its digestive energies, without any fixed inflammatory irritation or phlogosis.

Diarrhœa from the application of cold to the body is not often of the simple fæculent variety. If, in the beginning of the complaint, the discharges are fæculent, which may frequently be the case, they seldom continue to exhibit this character throughout, more especially when its course is protracted, and other sources of gastric derangement are present. The tendency to high inflammatory irritation in the mucous membrane of the stomach and bowels in cases excited by cold, is in general very con-

siderable, and many instances of this kind, accordingly, early assume a much more violent character—the discharges becoming watery with floculi of mucus—or mucous with streaks of blood, attended with febrile symptoms, and a constant tenderness or soreness of the abdomen.

The occurrence of simple fæculent diarrhœa from dentition is very common. When the complaint arises from this cause the discharges are sometimes mixed with an abundance of green bile, more commonly however there is but very little or no bile, in a separate state perceptible in the evacuations. The stomach also usually considerably disordered, and the child generally manifests a fretful and irritable temper. In some cases the diarrhœal discharges alternate with short periods of costiveness, and these intervals of intestinal torpor are almost invariably attended with increased symptoms of general irritation.

Treatment.—It has already been stated that fæculent diarrhœa from crude or irritating substances taken into the stomach sometimes terminates spontaneously as soon as the offensive materials are evacuated by the purging which they excite. It would not, however, be prudent to rely long on a spontaneous cessation; for the irritating cause may be retained many days, notwithstanding the occurrence of frequent copious and forcible diarrhœal discharges, and ultimately give rise to inflammatory irritation in the mucous membrane of the bowels. It is, therefore, always the safest plan, in cases of this kind, to secure an early and entire expulsion of the irritating contents of the bowels, by suitable purgatives. Magnesia is the most appropriate article for this purpose where there are indications of acidity in the primæ viæ. In cases unattended with acid in the stomach, castor oil, rhubarb with or without small portions of calomel, and in very young infants, syrup of rhubarb, are, perhaps, the most suitable purgatives. After the purge has operated, the excitement of the bowels ought to be allayed by an opiate. The last time, in general, for exhibiting the opiate is in the evening. From one to three grains of Dover's powder, according to the age of the child, or a few drops of laudanum, should be used for this purpose. A suitable dose of Dover's powder in union with a small portion of calomel, forms a peculiarly useful anodyne

in cases of this kind. If the last discharges brought away by the purge exhibit an unnatural appearance, or if there is reason to think that the bowels have not been entirely freed of their irritating contents, the purgative ought to be repeated, and again followed by an opiate. The nourishment should be simple and bland, and taken in moderate quantities. Arrow root, barley water, oat meal gruel, sago, boiled milk, rice, &c. constitute the most appropriate articles of diet. Particular care should be taken that the stomach be not overloaded with food. The blandest nourishment will be apt to keep up the complaint, if more of it be taken at a time, than can be easily digested. The portion that remains imperfectly digested, becomes a source of irritation to the bowels, and keeps up the disease.

When in recent cases arising from errors in diet or irritating ingesta, considerable nausea or ineffectual efforts to throw off the contents of the stomach occur, much benefit may sometimes be derived from the operation of an emetic. Dr. Dewees recommends full doses of calomel, as "the best possible" means for relieving the stomach in cases of this kind. It rarely fails to produce pretty active vomiting, and operates also as a purge. I have generally preferred the use of ipecacuanna, where an emetic was indicated, both on account of its mild operation, and its tendency, in minute doses, to allay intestinal irritation. After the stomach has been well evacuated by the ipecacuanna, a small dose of calomel, followed in the course of three or four hours by a suitable portion of castor oil, should be given to remove the irritating contents of the bowels.

Recent cases of fæçulent diarrhœa, excited by improper ingesta or errors in diet, generally yield readily as soon as the offensive materials are evacuated and the bowels tranquillized by an opiate. Sometimes, however, the cause that has excited the disease, produces, at once, a considerable degree of irritation in the mucous membrane of the bowels, in consequence of which the diarrhœal discharges continue after the original cause of the complaint has been removed. When this happens, and the disease continues, purgatives are no longer adequate to arrest the progress of the bowel affection. Indeed, it is of great importance to bear in mind, that harsh and frequent purging may do a great

deal of injury by increasing the mucous irritation, and converting it into actual inflammation. Simple diarrhœa, is frequently converted into an aggravated form of the disease, by the injudicious practice of exhibiting active purgative remedies, after the bowels have been once or twice freely evacuated in the beginning of the complaint. It is seldom necessary or proper to employ more than two or three active purges in cases of fæculent diarrhœa, from transient or temporary exciting causes. To obviate the retention and injurious impressions of vitiated secretions, in cases of this kind minute portions of calomel and ipecacuanna in union, followed by a moderate dose of castor oil generally answers very well. A half a grain of calomel with the same quantity of ipecacuanna, for a child of from one to two years old, seldom fails to produce a sufficient laxative effect. Should it fail, however, its operation may be promoted by the administration of a moderate dose of castor oil. When fæculent diarrhœa assumes a protracted and obstinate character, without any decided indications of inflammatory irritation in the mucous membrane of the bowels, the regular employment of small doses of Dover's powder, in union with prepared chalk, and minute portions of calomel, together with a strict attention to the diet, often produces an excellent effect. A powder composed, a grain of Dover's powder, one sixth of a grain of calomel, and five grains of prepared chalk may be given two, three, or four times daily, according to the age of the patient and violence of the complaint. Vegetable astringents, also, often do much good in protracted cases of simple diarrhœa, provided the mucous membrane of the bowels be free from inflammatory irritation and the irritating contents of the alimentary canal have been properly evacuated by purgatives. They are by no means suitable, however, in cases associated with an inflammatory state of the bowels, or with an irritable and febrile condition of the general system. When the diarrhœal discharges are fæculent and very liquid, and unaccompanied by griping and tenderness of the abdomen, remedies of this kind often operate very beneficially. A decoction of blackberry root, or the root of geranium maculatum, in milk has more frequently succeeded in my hands, than any other article of this kind. The geranium root especially, is an agreeable and efficient astringent, and may be freely employ-

ed with but very little or no risk of unpleasant irritation. An ounce of the dry root should be boiled in a pint of fresh milk, until one half is evaporated. From a teaspoonful to a tablespoonful of this decoction should be given four or five times daily according to the age of the patient. I consider this astringent decidedly preferable to the gum kino, so frequently employed for this purpose. Kino is more apt to derange the digestive organs and to occasion irritation in the mucous membrane of the bowels than the geranium. The effects of the latter, too, in arresting the inordinate action of the bowels, are much more mild, gradual and permanent than those of the latter, which though sometimes very prompt, are often transient, the complaint recurring after a temporary suspension. It may be again observed, however, that astringents as a general rule, are decidedly improper, in diarrhœa, connected with high irritation, inflammation, or structural lesion of the intestinal mucous membrane.

Cretaceous preparations were formerly almost indiscriminately used in the bowel complaints of children. When the complaint arises from acidity in the primæ viæ, and when there are no indications of inflammatory irritation of the bowels present, cretaceous remedies sometimes produce very excellent effects. They are not proper, however, in cases of an opposite character—that is where the discharges are mixed with masses or flocculi of mucus, and accompanied with much tormina and soreness of the abdomen. In the ordinary bowel complaints of infants, during the summer months, there is usually a very considerable tendency to inflammation or high vascular irritation of the mucous membrane of the intestinal canal, and hence cretraceous remedies often lead to very unfavorable consequences in these cases.

When fæculent diarrhœa arises from cold, it is almost invariably accompanied with more or less conspicuous symptoms of febrile irritation. The skin is usually dry and hot, and the patient fretful and irritable. In some instances of this kind, the evacuations are watery, and copious, and passed off with little or no griping. More frequently, however, there is a considerable portion of mucus mixed with the fæces, and the patient experiences severe tormina. In such cases it will be useful to promote the expulsion of the acrid secretions from the bowels, by one or two mild laxa-

tives; but repeated and active purging, is calculated to do much mischief, by increasing the centripetal determination of the circulation, and favoring the occurrence of inflammation in the mucous membrane of the bowels. After the contents of the bowels have been freely evacuated by a dose of castor oil, small doses of Dover's powder and calomel generally prove highly beneficial in these cases. One grain of the former with half a grain of the latter may be given, twice, thrice, or four times daily, according to the age of the patient and the urgency of the complaint. The abdomen should be enveloped with flannel, and the feet kept warm and dry. The warm-bath may also be used with considerable advantage in such cases,—particularly when the skin is dry and harsh. Astringents and absorbents are entirely inappropriate in cases of this kind.

In diarrhœa, depending on dentition, it is necessary to proceed with much caution in the employment of remedies calculated to arrest its progress. Moderate diarrhœa, often exerts a very salutary effect during dentition. It tends to counteract the preternatural determination of blood to the head, and to diminish the cerebral irritation which is apt to occur in difficult dentition. Children who are affected with diarrhœa while cutting teeth, are much less apt to become affected with convulsions and diseases of the brain, than those whose bowels are habitually torpid during this important process. If the complaint is moderate, no attempts ought to be made to arrest its course by internal remedies. It will tend, in some degree, to protect the brain from injurious irritation, and to keep down the general irritable and febrile condition of the system. If the gums are swollen, they ought to be divided with a lancet down to the advancing teeth, and particular care should be taken that the nourishment be simple, and unirritating. It is, indeed, of the utmost consequence in cases of this kind, to avoid every thing, in the way of diet, that is calculated to increase the intestinal irritation. If the patient is permitted to use crude or inappropriate articles of food, it will scarcely be possible to prevent the complaint from assuming a very aggravated and unmanageable character. Diarrhœa from dentition, depends, mainly on a morbidly irritable condition of the bowels. If the ingesta are bland and adapted to the digestive powers of the

child, the complaint may go on moderately, and with a salutary tendency, until the teeth are protruded. A single error in diet, however, may give rise to a state of inflammatory irritation in the bowels, which it will be extremely difficult to remove, so long as the system is under the influence of dentition. When diarrhœa from teething acquires a violent character, advantage may be derived from an occasional dose of castor oil, opiates, ipecacuanna and warm-bathing. There is no variety of diarrhœa in which opiates operate more favorably than in cases arising from dentition. The Dover powder, from its decided diaphoretic tendency, is, in general, the best form for using opiates in complaints of this kind. I have hitherto, generally, depended chiefly on the use of this article, for moderating severe cases of diarrhœa, during difficult dentition. It should be given in very small doses, at sufficient intervals to prevent nausea or vomiting. Ipecacuanna, also, is an excellent remedy in cases of this kind. When administered in doses of a sixth or a fourth of a grain, it often exerts a very tranquillizing influence on the bowels. The dose should be repeated every two or three hours. When the evacuations manifest a deficiency of bile, small portions of calomel should be united with the Dover's powders. Care must, however, be taken not to carry the use of calomel to the extent of affecting the gums, or producing a general mercurial excitement. Astringents are wholly inadmissible in these cases.

Bilious Diarrhœa.—This variety of the complaint is attended with inordinate functional activity of the biliary organs. The secretion of bile is excessive in quantity, and doubtless, also, frequently vitiated in its composition. The evacuations are very fluid, copious, and mixed with a great abundance of green or yellow bilious matter. The urine is generally conspicuously imbued with bile, and when the complaint goes on for two or three days, the skin and white of the eyes, usually acquire a yellowish or slightly jaundiced hue. Cases of this kind seldom occur during the cold seasons of the year. High atmospheric temperature appears to be the ordinary remote cause of this modification of diarrhœa. It is not improbable, however, that what is usually ascribed to the direct influence of solar heat on the animal system,

in the production of this and other forms of bilious disease, may depend, mainly on the influence of the miasmata which are always more or less abundantly diffused throughout the atmosphere during hot seasons, and which are well known to exert a direct and powerful influence on the biliary organs. Bilious diarrhœa is much more common in situations abounding in materials adapted for the generation of malaria, than in localities of an opposite character. In populous cities and in marshy districts, this complaint is very common during the hot months of the year; whereas in dry, open and elevated situations, it is but very rarely met with.

In some instances, the bile, though extremely copious, exhibits a perfectly natural or healthy character; in other cases, it presents an unnatural appearance, and is so acrid, as to cause a severe burning sensation in the extremity of the rectum, and sometimes very painful irritation about the anus. Cases of the former kind are usually easily managed; but the latter, are apt to assume a violent and obstinate character, in consequence of the early supervention of inflammatory irritation in the mucous membrane of the intestinal canal. Cases sometimes occur in which the evacuations are at first highly bilious. After having continued for some days, the appearance of bile, in the discharges ceases, and the evacuations become watery, without the slightest trace of bilious matter. When this change takes place, the stomach, usually, becomes irritable, and the disease assumes the character of chronic cholera. The liver in cases of this kind, appears to be torpid, from great sanguineous engorgement.

Diarrhœa of a highly bilious character, is sometimes produced by improper nourishment, or by bad milk. These cases are most apt to occur during the first two or three months of infancy, and are generally associated with much acidity in the primæ viæ. When the disease is excited in this way, the discharges are generally of a bright-green color, and attended with severe griping.

Treatment.—In the treatment of this modification of diarrhœa, the indications, are, to remove the acrid secretions out of the bowels, to subdue the morbid irritability of the intestinal canal, and to correct the functional derangement of the biliary organs. The bowels should, in the first place, be thoroughly evacuated

by a suitable dose of castor oil. After this has been effected, minute portions of calomel and ipecacuanna must be given, in repeated doses during the day, and an opiate in the evening. The fourth of a grain of calomel with the same quantity of ipecacuanna may be given every two or three hours, to a child under three years old, and continued until the character of the evacuations is improved. Minute portions of calomel are, in general, more beneficial in diarrhœal affections, associated with an excess of bile, than large and purging doses. When large doses are frequently repeated—more especially in infants—they sometimes give rise to much irritation in the mucous membrane of the alimentary canal; and they are, moreover, less apt to allay the morbid irritability of the bowels than very small doses.

To prevent the retention and accumulation of vitiated or irritating secretions in the bowels, it will be proper to exhibit an occasional dose of castor oil; or an additional portion of calomel may be given, once daily, or every other day, according to the effects of the ordinary doses and the character of the evacuations. Opiates, are in general, much less useful in this variety of diarrhœa than in the preceding one. If the patient is free from fever, advantage may be obtained from a few drops of laudanum, or a moderate dose of Dover's powder administered in the evening, particularly after the operation of a purgative; but opiates ought not to be employed for the purpose of arresting the diarrhœal discharges so long as the evacuations are characterized by a superabundance of bilious matter. Astringents and absorbents are still more objectionable. The principal object to be kept in view, in the treatment of this variety of the complaint, is to correct the functional disorder of the biliary organs; so long as this is not accomplished all attempts to restrain the inordinate action of the bowels, by opiates or astringents, must not only be abortive, but often highly injurious. Should the evacuations assume a natural appearance, and the diarrhœa, notwithstanding continue, it will then be proper, to administer small doses of Dover's powder in union with the calomel, in order to subdue the morbid irritability of the bowels.

In cases attended with febrile irritation, recourse should be had to antimonials. A few drops of antimonial wine, or a teaspoon-

ful of a solution of tart. emetic, of the strength of a grain to two ounces of water, should be given every hour or two. James' powder is an excellent antiphlogistic in cases of this kind. It may be very advantageously given in union with calomel. I have often used the following mixture with very decided benefit in such cases. A teaspoonful of it, should be given every two or three hours.

Spirit Menderiri . .	℥ii.
Spirit Nit. Dulc. . .	ʒii.
Vir. Antimonii . .	ʒi.
Tinct. Opii. . . .	gtt.

Some advantage may also be obtained from warm bathing, and from the free use of mucilaginous diluents, such as barley water, slightly acidulated with lemon juice. When the abdomen becomes tender or sore to pressure, the application of a large emolient poultice over the abdomen, and renewed from time to time, is calculated to do much good. When the abdominal tenderness is attended with very thin discharges—resembling a solution of verdigris in turbid water, containing flakes of intestinal mucous, purgatives must be very cautiously employed. Frequent purging, under such circumstances, could scarcely fail to aggravate the intestinal irritation. The small doses of calomel and ipecacuanna mentioned above, in conjunction with an occasional purgative enema, will, in general, suffice to prevent the undue retention and accumulation of acrid substances in the bowels. Should a purgative be deemed necessary, however, castor oil, with a few drops of laudanum, is decidedly the best article. After the purge has operated, the bowels ought to be tranquillized by an efficient dose of laudanum or Dover's powder.

Mucilaginous diluents may be freely allowed; and in the present variety of the complaint, slightly acidulated drinks, are often peculiarly grateful, and I have never known any ill effects to result from their use. The diet ought to be of the simplest and blandest farinacious substances. Thin preparations of arrow-root, tapioca, sago, rice, barley, and boiled milk, constitute the most suitable nourishment in cases of this kind. Animal fluids—such as beef or chicken tea, are apt to irritate the bowels and to aggravate the diarrhœal affection. After the disease has been sub-

dued, a mixture of equal parts of a thin preparation of arrow-root, and beef or chicken tea, forms a very proper nourishment; bu during the continuance of the bowel complaint the patient ought to be restricted to the exclusive use of the mucilaginous articles just mentioned. The body should be carefully protected against the injurious influence of cold. Cool and damp night air, after a warm day, is particularly apt to excite or aggravate bilious diarrhœa. Children affected with diarrhœa ought not to be washed with cold water. This precaution is particularly proper in very young infants.

Mucous diarrhœa.—In this variety of diarrhœa, the mucous membrane of the bowels is in a much more irritated condition than in the two preceding modifications of the complaint. In fæculent and bilious diarrhœa, the irritation is chiefly located in the small intestines; but in the present form, its principal seat is in the colon and rectum. In some instances the evacuations consist almost entirely of intestinal mucus; but in the majority of cases a considerable portion of fæculent matter of an unnatural appearance passes off with the mucus. The mucus is generally the last portion evacuated, and in many instances a small quantity of unmixed mucus precedes the fæculent portion of the discharge. The evacuations are seldom very frequent or copious. They are sometimes streaked with blood, and a slight degree of tenesmus and straining occurs in many cases. The discharges are usually preceded by severe tormina, and in protracted cases, the abdomen becomes decidedly tender or sore to pressure. Mucous diarrhœa, in fact, differs only in degree from dysentery. When neglected or mismanaged it sometimes assumes all the characteristic phenomena of the latter form of intestinal disease. It may be regarded as a catarrhal affection of the bowels, and is produced, generally, as other catarrhal affections are, by cold—causing a sudden torpor of the cutaneous exhalents. In mild cases, the mucus, usually, presents its ordinary natural appearance; but when the disease continues for sometime, and assumes a more severe character, it, generally becomes opake and whitish resembling cream or pus. The appearance of the whitish or puruloid matter in the evacuations, indicates the existence of

inflammation in some portion of the mucous membrane of the bowels, and is always to be regarded as a highly unfavorable symptom. Cases of this kind, are generally attended with slight febrile irritation, and the skin is almost invariably dry and harsh.

Treatment.—Dr. Dewees recommends the daily exhibition of a moderate dose of castor oil, and an opiate in the evening until the bowels are relieved. This mode of treatment, will frequently put a speedy stop to the disease; but the *daily* exhibition, of even so mild a purge as castor oil, may do serious injury, by aggravating the mucous irritation of the bowels. I am quite certain that I have seen mild cases pass into severe or purulent ones, under the daily employment of purgatives; and I am equally satisfied that daily purging is, in general, altogether unnecessary to the safe and successful treatment of the complaint. The disease, as has already been stated, is generally brought on by a sudden suppression of the perspiration. An important object, therefore, in its remedial management, is to restore the regular action of the cutaneous exhalents. In the commencement of the treatment, the bowels ought to be freely evacuated, by an efficient dose of castor oil, to which a few drops of laudanum should be added. After the oil has operated, small doses of ipecacuanna and calomel should be given at regular intervals, and a full dose of Dover's powder in the evening. To an infant of between one and two years old, a fourth of a grain of the former with the sixth of a grain of the latter, may be given every two hours.

When the evacuations are attended with severe tormina, and the patient is free from fever, small doses of Dover's powder should be occasionally substituted for the ipecacuanna. To prevent the retention of irritating substances in the bowels, a mild laxative clyster should be administered, once or twice daily. A few drachms of manna dissolved in a gill of warm water,—barley water with a teaspoonful of common salt, or molasses-water, form proper mixtures for this purpose. When the stools are frequent and small, and the patient is observed to remain a long time on the vessel and to strain, mucilaginous injections with a suitable portion of laudanum, generally afford very considerable relief. Should the disease continue for three or four days, a second dose

of castor oil and laudanum may be given, if the ipecacuanna and calomel, together with the laxative enemata do not appear to free the bowels sufficiently of their vitiated contents. To promote the action of the cutaneous exhalents, warm bathing, will be useful; and a broad flannel roller should be worn next the skin, round the abdomen. The drink and diet should be mucilaginous. All solid food is decidedly objectionable. When the disease assumes a chronic character, with a puruloid appearance of the mucous discharges, considerable benefit may sometimes be derived from small doses of balsam capaiva, in the form of an emulsion. From five to ten drops of the balsam may be given two or three times daily, together with a few drops of laudanum. I have frequently employed this article in conjunction with minute portions of Dover's powder with the happiest effect in cases of this kind.

Chylous diarrhœa.—In this variety of diarrhœa, the evacuations are of a whitish or milky color with a manifest deficiency of bilious matter. The principal irritation, in cases of this kind, is evidently seated in the upper portion of the small intestines. The mucous membrane of this section of the bowels, appears to be in a sub-inflamed condition; in consequence of which, the sensibility of the mouths of the lacteals is so changed or perverted as to prevent them from taking up the chyle. The tormina or griping is always felt in the upper part of the abdomen; and the epigastrium is almost invariably somewhat distended, and tender to pressure. The hands and feet are apt to be cold; and the skin usually acquires a peculiarly sallow appearance, more especially in cases of protracted duration. The patient is soon much weakened, and emaciation generally goes on very rapidly. Chylous diarrhœa, is seldom attended with distinct febrile symptoms, but the nervous system often becomes morbidly irritable.

This variety of diarrhœa occurs under very different degrees of violence and duration. Recent cases, excited, suddenly, by irritating or improper articles of nourishment or cold, are usually mild and of easy management; but when the complaint comes on slowly, in consequence of long-continued derangement of the digestive organs, or habitual disturbance of the bowels, it frequently

assumes a chronic and very obstinate character, so as sometimes to resist remedial effort.

Dr. Dewees, thinks that the absence of bile in the duodenum, constitutes the principal cause of the chylous evacuations. The want of bile, he conceives, will prevent the healthy elaboration of the chyme, in consequence of which it will "act upon the susceptible bowels," as an irritant, and "urge them to an increased peristaltic motion."

It may be observed, however, that the absence of bile in the duodenum generally produces a very different effect, from that which is ascribed to it in this explanation. Torpor of the bowels and constipation are the usual consequences of deficient biliary secretion, and it appears moreover from, the experiments of Tiedeman and Gruelin that the presence of bile is not necessary for healthy elaboration of the chyme. It seems more probable that chylous diarrhœa depends on a highly irritable and irritated condition of the mucous membrane of the small intestines, more especially of the duodenum, in connection with an impaired and imperfect performance of the digestive functions. The absence of bile in the evacuations is, perhaps, occasioned by a spasmodic constriction of the orifice of the bile duct; and the lacteals may fail to take up the chyle from a similar condition of their mouths.

Treatment.—The principal indications are, to allay the irritability and irritation of the duodenum, and to restore the healthy functions of the digestive organs. Purgatives are wholly inadmissible in the treatment of this variety of diarrhœa. Minute doses of calomel and Dover's powder, in conjunction with emolient or stimulating applications to the epigastrium, warm bathing, and proper dietetic regulations, constitute the principal means for combating this affection. The sixth of a grain of calomel, with a fourth of a grain of Dover's powder, should be given every two or three hours, until the evacuations become bilious. A stimulating plaster or a large emolient poultice should be laid over the upper part of the abdomen. A plaster composed of a tablespoonful of powdered cloves, the same quantity of black pepper, a few teaspoonfuls of cayenne, and two tablespoonfuls of flour, mixed up into the consistence of paste with strong vinegar,

forms an excellent stimulating application for this purpose. A simple emolient poultice, will, in general, do much good, in cases of this kind. In severe and obstinate cases, recourse should be had to the application of a blister over the epigastrium. The plaster should not be left on the skin more than three or four hours. If it is removed, as soon as the skin is slightly inflamed, and an emolient poultice laid over the part, a fine blister will be raised in the course of a few hours, and procure all the advantage that can be obtained from vesication, without subjecting the child to the severe pain which commonly attends the usual mode of blistering.

In a few instances of this modification of diarrhœa, I have obtained much benefit from small doses of the muriated tincture of iron and laudanum. Two drops of the former with a drop of the latter, may be given three or four times daily. A mixture composed of three or four grains of powdered chamomile flowers, a grain of Dover's powder, and a fourth of a grain of calomel, taken three times daily, will, also, sometimes operate very beneficially. Whatever remedies may be employed, a strict attention to proper dietetic regulations is indispensable to success, in treatment of this affection. All solid food must be rigidly forbidden. Nothing but the simplest mucilaginous fluids should be allowed—such as barley water, very thin arrow root, prepared without milk, gum arabic water, a liquid preparation of sago, tapioca, rice water, or a mixture of equal parts of cow's milk and water. It is particularly necessary to avoid taking much food at a time; and the intervals between the meals should be sufficiently long to ensure the entire digestion of the food last taken, before fresh nourishment is received into the stomach.

Lienteric Diarrhœa.—In this variety of diarrhœa, the evacuations, along with more or less vitiated fæculent matter, mucus, occasionally bile, contain articles of food in an imperfectly digested or wholly unchanged condition. At first the discharges do not occur until several hours after eating: but if the disease is suffered to continue, the intervals between the reception of food and its evacuation by the bowels, becomes shorter and shorter, until at last almost every thing that is taken into the stomach is speedily thrown off again by the intestines. Soon after eating, the patient, usual-

ly, experiences a good deal of uneasiness in the epigastric and umbilical regions. This is in a short time followed by severe tormina, which in a few moments terminates in a rapid diarrhœal evacuation. In many cases, however, the discharges occur with but very little or no griping whatever. The appetite is always much deranged. In some instances it is weak and capricious, loathing almost every thing, but a few particular, and generally strong, articles of food. In other cases the desire for food is voracious; and the most crude, irritating and high-seasoned articles are those which are often the most desired. In cases of this kind the abdomen is freqently very tumid and hard, and the extremities and body emaciated. Moderate pressure on the abdomen seldom occasions any decided manifestation of tenderness or pain; but a sudden concussive agitation of the body, such as coughing or sneezing, or jumping from a chair, &c. almost always gives rise to a feeling of soreness and pain in the epigastric and umbilical regions. In the majority of instances, there is but very little or no bile observable in the evacuations. Occasionally, however, the stools are mixed with a considerable quantity of dark green bilious matter of a glairy consistence, or of a bright green fluid, resembling a solution of verdigris in water.

This form of diarrhœa very seldom, if ever, arises from the operation of a temporary exciting cause. It generally comes on gradually, as a consequence of mismanaged fæculent or bilious diarrhœa, or from the habitual use of irritating articles of food, in conjunction, perhaps, with other causes capable of deranging the digestive organs.

Lienteric diarrhœa may be regarded as a violent form of indigestion accompanied with excessive irritability and subinflammatory irritation of the stomach and small intestines. In chylous diarrhœa, the morbid irritability and irritation is principally located in the small intestines, more especially in the duodenum, without much impairment of the digestive powers; whereas, in the present variety of the complaint, the stomach is manifestly the principal seat of the disease. The mucous membrane of the stomach is probably always in a subinflamed condition in violent cases of lienteric diarrhœa. In some instances, the morbid condition of the mucous membrane, extends throughout nearly the

whole tract of the intestinal canal. In cases of this kind, the appetite is often quite voracious, the abdomen is tumid and tense, and the evacuations are generally mixed with an abundance of mucus. These cases are to be regarded as instances of chronic diarrhœa, attended with a morbidly irritable and enfeebled condition of the digestive organs, and are always connected with chronic inflammation, and frequently ulceration of the mucous membrane of the colon. In general, when chronic diarrhœa is the consequence of irritating substances taken into the stomach, and the digestive powers are much disordered, the evacuations, are apt to assume more or less of a lienteric character.

Treatment.—It is obvious, from what has been said in relation to the pathology of this variety of diarrhœa, that the principal objects to be kept in view in its remedial management, are, to subdue the morbid irritability and inflammatory irritation of the stomach and bowels, and to restore the healthy performance of the digestive functions. One of the most important and indispensable means for the fulfilment of these indications, is a perfectly bland, simple, and moderate nourishment. All solid articles of food must be rigidly avoided. If the child is still nursed at the breast, no change of course, is necessary, unless there are good grounds for believing that the milk is depraved. Thin preparations of arrow-root, tapioca, sago, rice, or barley, a mixture of cow's milk and water, a solution of gum arabic in water, &c. constitute the best articles of nourishment in such cases. The drink too ought to be perfectly bland, and cool. Even these bland alimentary substances ought to be used in moderate portions. The patient can derive no support from the reception of more food than the stomach can digest. A small portion only will be digested; the remainder passes in an undigested state into the duodenum, and keeps up the exhausting diarrhœal discharges. Among the internal remedies suitable in cases of this kind, opium, hyoseyamus, muriated tincture of iron, and very finely powdered charcoal, are decidedly the most valuable. In the commencement, two or three drops of the muriated tincture of iron with one or two drops of laudanum may be given once, twice, or three times daily, according to the age of the patient. I have, in several instances of this

kind, resorted to the external application of morphia with the happiest effect. The tenth of a grain of this narcotic preparation applied to a part from which the cuticle has been removed by blistering, will procure all the soothing effects of opium, without incurring the risk of nauseating the stomach. Calomel is not, in general, a proper remedy in this form of diarrhœa. When the liver is manifestly torpid, however, minute portions may be given once or twice daily, in union with opium; but I have generally preferred applying a mercurial plaster over the right hypochondrium. Hyoscyamus, in conjunction with small doses of the muriated tincture of iron or of chalybeate wine, sometimes operates very beneficially. Thirty grains of good extract of hyoscyamus may be dissolved in two ounces of water. Of this solution, three or four drops in union with the same quantity of chalybeate wine, or a drop of the muriated tincture, may be given two or three times daily, to a child between one and three years old. After the irritability of the stomach has been, to a considerable degree allayed, small doses of finely prepared charcoal with minute portions of opium, frequently produce very excellent effects in this modification of diarrhœa. In some instances, however, I have found this article to increase the gastric irritation; yet in the majority of cases, in which I have employed it, its effects were unequivocally beneficial. Five grains of the charcoal, with the twentieth of a grain of opium, may be given two or three times daily. In addition to the foregoing means, rubefacient or vesicatory applications, can never be neglected without losing very important remedial resources in cases of this kind.

The abdomen should be rubbed with dry flannel, or with some stimulating liniment, until the skin become red, several times daily. I have known much benefit to result from the application of the spice plaster to the abdomen, already mentioned under the head of chylous diarrhœa. In severe cases, postulation with tartar emetic ointment, or what appears to me better, the application of a blister to the epigastrium, may be resorted to with much propriety. Indeed, I have more frequently made a decided and prompt curative impression on the disease by blistering, than by any other remedy. The plaster need not be sufficient to remain on the skin until the vesication has taken place. When taken off as

soon as the skin is uniformly red or inflamed, which usually occurs in three or four hours, and a soft emolient poultice applied over the part, a fine blister will be raised, without subjecting the child to much irritation or pain. The blistered surface will afford an excellent opportunity for the external application of opiates. Gentle exercise, by gestation in the open air, will be a useful auxiliary to the means already mentioned. I have known children, who had been a long time harassed with this form of diarrhœa in the city to recover, speedily on being removed into the country. In general cases of this kind pass off very slowly. When the disease is connected with chronic inflammation of the colon, and the abdomen is tumid, tense and sore to pressure, it often resists every effort to subdue it. I have in one instance of this character, succeeded in curing the disease, by use of the *conferva helminthocordon*. I employed a decoction, made by boiling two drachms of it in a pint of water, down to half a pint. This was administered in teaspoonful doses every four hours, in union with three drops of laudanum. The child was between four and five years old.*

After the lienteric discharges have ceased, and the evacuations present a natural fæculent character, benefit may be derived from small doses of colomba, or powdered chamomile. Nothing of this kind, however, must be used until the discharges are decidedly and wholly fæculent. Great care should be taken that nothing but the simplest and most appropriate diet be allowed for several months, after the patient has recovered from the complaint. Slight errors in diet may re-excite the disease.

Chronic Diarrhœa. *Atrophia Ablactatorum.*—Children are liable to two distinct varieties of chronic diarrhœa. The most common modification of chronic diarrhœa, generally occurs at an early period of childhood, and is manifestly attended with prominent derangement of the liver stomach, and small intestines. The other variety generally occurs at a more advanced age, and corresponds entirely with the chronic diar-

* I was induced to employ this remedy, by having noticed several obstinate cases of chronic diarrhœa, entirely removed by Swaim's Vermifuge—a nostrum, which I have sufficient grounds for believing, consists principally, of a decoction of the *conferva helminthocordon*.

rhœa of adults, depending mainly on chronic inflammation, of the mucous membrane of the colon. The first of these varieties of the complaint, has been well described by Dr. Cheyne, under the name of "atrophia ablactatorum," as a new and very peculiar form of diarrhœal disease. It differs, certainly very considerably in its phenomena and pathological character, from the chronic diarrhœa of adults; but this difference depends rather on the portion of the alimentary canal principally diseased, than on any essential diversity in their natures, both being nothing more than different modifications of confirmed or chronic states of common diarrhœa. When recent cases of bilious or fæculent diarrhœa are neglected, or mismanaged, or when the exciting cause continues to act, they are apt to assume an aggravated and obstinate character, presenting all the appearances that are described as characterizing the "weaning brash," or atrophia ablactatorum. Dr. Cheyne is of opinion that "this form of chronic diarrhœa is imputable to an increased secretion of acrid bile." The biliary secretion is certainly often very abundant and perhaps depraved in cases of this kind; but this morbid condition of the bile is probably a consequence, rather than the cause of the gastro-intestinal irritation, upon which the diarrhœal affection depends. It seems, to me very clear that the exciting causes of this complaint do not differ from those which give rise to the usual fæculent and bilious varieties of diarrhœa. Gastric irritation from inappropriate articles of nourishment, or other errors in diet, appears to be the ordinary source of this complaint. It may be observed, that inasmuch as this disease is incomparably more common immediately after weaning than at any other period of infancy, there must be something peculiar in its mode of origin and character. It might be expected, however, that a complaint which arises from gastric irritation, produced by inappropriate alimentary ingesta, should be much more common at the time when the child suddenly passes from the bland and congenial nourishment provided for it by nature, to an exclusive and frequently illy adapted artificial diet. Few individuals can sustain a sudden and total change of food, without experiencing more or less disorder of the stomach and bowels. A

person who has been a long time confined to animal food, will probably become affected with diarrhœa, if he passes suddenly to an exclusive vegetable diet. The tendency of weaning, to give rise to bowel complaints, is, doubtless, much increased by the influence of dentition on the alimentary canal. This process, is frequently accompanied with so much irritability of the stomach and bowels, that the mildest articles of nourishment are apt to operate as irritants and to excite diarrhœal discharges. It is easily to be conceived, therefore, that diarrhœa must not only be much more frequent, but also more violent and protracted when weaning and dentition co-operate in deranging the alimentary canal than at any other period. Dr. Cheyne says, that, "the disease is most frequent in children who are weaned before the eighth or ninth month;" and this corresponds entirely with my own observations. At this early period, teething is usually going on actively, and the powers of the stomach are in general not yet sufficiently developed, to digest with due facility, the artificial nourishment substituted for the mother's milk. The liability to gastric derangement and diarrhœa from these causes, is much greater when the weaning is abrupt, than when it is accomplished, as it always should be when practicable, in a slow and gradual manner. When the change is suddenly effected, and especially, when the nourishment is unsuitable to the delicate and excitable state of the infant's stomach, it can hardly fail to occasion some degree of gastric derangement. In many instances the stomach gradually accommodates itself to the new kind of nourishment, and all inconveniences which may have resulted from it at first, disappear. When, however, the digestive organs and liver are particularly predisposed to morbid excitement, as they often are during dentition, or when the diet is decidedly improper, weaning is apt to be followed by a high degree of gastrio-intestinal irritation, or violent and obstinate diarrhœa. Thus, the artificial nourishment, at first, deranges the digestive powers; the food remains a long time in the stomach before the process of digestion is completed; acid and other irritating fluids are generated. These together with the imperfectly digested food, irritate the stomach and bowels still more, and excite purging. The irritation is extended to the liver, and a redun-

dant or vitiated secretion of bile takes place. The irritating causes being thus progressively increased, and the original exciting cause, namely the inappropriate nourishment continued, a high state of irritation is established in the mucous membrane of the alimentary canal, with great perversion of the hepatic and intestinal secretions; which, in the majority of instances, finally passes into actual inflammation.

Dr. Cheyne, in the account he has given of the post-mortem appearances, states that throughout the whole tract of the intestinal canal a number of "singular contractions with one or more intus-susceptions," were noticed in every instance. "The liver was larger than natural, exceedingly firm, and of a bright red colour." The mesenteric glands were inflamed and swollen in some instances; in others they were nearly natural. The intus-susceptions were without inflammation or adhesions. The contractions were "of a spasmodic kind," and could be "permanently dilated again, by pushing the finger into them." "These appearances, he says, lead me to imagine that the weaning brash in its confirmed state is ascribable to an increased secretion of acid bile, or rather to the morbid state of the liver which occasions this."* Dr. Dewees, observes, that the post-mortem appearances detailed by Dr. Cheyne correspond with those made in France by Andral and Cruveilhier. With regard to the dissections of Andral this is not correct. He distinctly mentions softening of the mucous membrane of the small intestines, and other marks of inflammation, as frequently connected with fatal cases of this kind. Since I have directed my attention particularly to the diseases of children, I have had an opportunity of dissecting but one single subject of this kind. In this case the mucous membrane of the pyloric extremity of the stomach and duodenum was in a highly injected condition; in the lower part of the ilium, there were a number of livid patches of irregular shape, in this tissue, and the whole length of the colon was contracted to a size that scarcely admitted my little finger. It can hardly be supposed, indeed, that the acrid and irritating substances which are continually in contact with this delicate structure in cases of this kind, could fail to excite some de-

* Cheyne, On Atrophia Ablactatorum &c. p. 18.

gree of inflammation in it. During the early stage of the disease the mucous membrane of the small intestines is probably only in a highly irritable and irritated condition. As the disease advances the biliary and intestinal secretions become more and more depraved, and the alimentary canal more irritable. The constant operation of these irritating causes, ultimately gives rise to more or less of inflammation, the irritation is extended to the liver and mesenteric glands, and these undergo morbid changes, and increase the severity and obstinacy of the disease. This complaint occurs most frequently, during the summer and autumnal months. Dr. Cheyne says, that he "has seldom, comparatively speaking, seen it commence before the solstice, nor after the end of the year." The tendency of warm and humid weather to favor the occurrence of bowel complaints in children, is well known. Solar heat renders the organism irritable, and, both through the agency of the miasmata which it engenders, and by its own direct influence on the human body, has a very decided tendency to excite and derange the biliary secretion. Children who are weaned during summer, while dentition is going on, are peculiarly liable to diarrhœa of a severe and obstinate character. This complaint generally commences, in the form of simple bilious diarrhœa. The stools at first are fæculent liquid and mixed with an abundance of bilious matter of a light green color. In the course of four or five days, if it is not counteracted by suitable remedies, sickness of the stomach, and occasionally bilious vomiting occur; and the purging becomes more frequent and often extremely painful. The patient now begins to lose his appetite; more or less febrile irritation ensues, attended with great fretfulness, restlessness, a warm and obstinately dry skin, and urgent thirst. The diarrhœal discharges gradually become more watery, griping and frequent; and the bilious matter, in general, less copious than at first. The body wastes, the flesh becomes soft and flabby, and the debility increases rapidly. In the course of three or four weeks, the fever assumes a regular form,— that is, slight exacerbations occur regularly once or twice daily, attended with a "hectic blush on one cheek," and a very frequent quick and corded pulse. "But the most characteristic symptom of this disease is a constant peevishness, the effect of unceasing griping

pain—expressed by the whine of the child, but especially by the settled discontent of the features."

The evacuations are by no means uniform in appearance throughout the course of the disease. At first the stools usually consist of a yellowish fæculent matter mixed with green bile of a glairy or uniform consistence. As the disease advances, and the intestinal irritation increases, the bile generally becomes more abundant and unnatural, presenting a curdled and dark-green appearance mixed with fœtid watery discharges. Sometimes the evacuations are dark brown, very fluid, and extremely fœtid, containing flocculi of mucus, and little masses of dark bile. Not unfrequently the discharges are, for a short time, ochrey or claycolored, and then change again to dark and bilious. At an advanced period of the disease, the stools are sometimes mixed with a considerable quantity of a yellowish white, or puruloid matter; and occasionally they assume a lienteric character,—small portions of imperfectly digested food appearing in the evacuations. When the discharges acquire a watery flocculent and very fœtid character; or when they become lienteric, or mixed with puruloid matter, we may conclude that the mucous membrane of some portion of the intestines is in an inflamed condition, and that the disease will probably resist every effort to remove it.

This form of diarrhœa, generally runs a very protracted course. It seldom terminates fatally "before the sixth or seventh week," and in many instances it continues three or four months before death takes place. During the first two or three weeks, its course may often be speedily arrested by judicious management; but when the complaint is mismanaged and suffered to run on for four or five weeks, it frequently resists every remedial effort. When the disease proves fatal at an early period, it is generally from its assuming the form of cholera, or from the supervention of convulsions.

Dr. Cheyne seems to think that dentition has but very little if any agency in the production of this complaint. "The weaning brash," he says, "I have the strongest reason to believe, has no connection with teething farther than they sometimes meet in the same child. I have known this disease, in many instances, where the gums were neither swelled, nor indurated, nor inflamed, and

where there was no salivation nor any appearance in the mouth. I have seen it where children were cutting their teeth easily; and where many of them came without difficulty before weaning, still the disease has supervened. But perhaps the strongest argument that can be used would arise from the observation which I have frequently made, that this disease occurs in children of three months; and I have often known it several months before teething came on." There can be no doubt, indeed, that the disease may, and often does, occur wholly independent of dentition; yet that the occurrence of the complaint is much favored by the irritation of dentition appears to me equally unquestionable. Difficult dentition is, in general, attended with obvious derangement of the digestive functions, and its tendency to increase the irritability of the stomach and bowels, cannot, I think, be questioned. It is, at all events, quite certain, that the instances of this disease, in which irritation from teething is manifestly present, are incomparably more frequent, than those in which no signs of dentition are observable. I have known bowel complaints in children before they were weaned, speedily brought to a favorable termination, simply by dividing the inflamed and swollen gums; and when the gums are in this condition from teething, in the present form of diarrhœa, unequivocal benefit is frequently derived from this operation. The observation made by Cheyne, that this complaint sometimes occurs before dentition commences, does not disprove its agency in the production of the complaint, where it does occur; but only shows that the disease may come on without this source of irritation. No one can deny the great share which abrupt weaning has in bringing on this disease; and yet it occasionally occurs before the child is weaned, or many months after the weaning took place. The truth is, this disease does not differ materially, in relation to its exciting causes, from other varieties of diarrhœa. The reason why it is more apt to assume a violent and chronic character, must be sought, as has been already stated above, in the permanency of its exciting causes, rather than in any thing peculiar in their character.

There is another form of chronic diarrhœa which is common to infants and adults, and which differs very considerably from the preceding variety, both in its phenomena and pathological character.

The evacuations in this form of the disease are characterized by an abundance of mucus, which, as the disease advances becomes mixed with a whitish or cream-like matter, sometimes slightly streaked with blood, and occasionally mixed with small portions of imperfectly digested food. Except, in the early stage of the complaint bile rarely forms a conspicuous part of the discharges. In some instances the evacuations are liquid, of a dirty brown color, containing an abundance of mucus in the form of flakes and small masses of purulent matter. Occasionally the fæculent matter mixed with the stools is of a whitish color and of a pap-like consistence. The appetite is generally very variable, and capricious. It is sometimes wholly depressed, though more frequently sufficiently active, and sometimes quite voracious. After the disease is completely developed, slight febrile irritation generally occurs—particularly towards evening and a few hours after eating. The pulse is generally frequent, small, quick, and sharp, and the skin almost uniformly dry and harsh. The abdomen in some cases, becomes tumid and hard, while the body emaciates more or less rapidly. The face acquires a pale, contracted and morose expression, and the temper becomes irritable and fretful. The patient usually experiences very severe colic pains a few hours after eating, more especially when the food consists of solid articles; and, in general, even the mildest nourishment is followed in an hour or two after receiving it into the stomach, by severe tormina, flatulency, and rapid diarrhœal discharges. The abdomen is almost always tender or sore to pressure, and the feet, and sometimes the face, ultimately become somewhat œdematous. The liver is generally inactive, and the small portion of bile that is occasionally discharged, is usually curdled and of a dark green or black color.

This variety of chronic diarrhœa, is seldom met with in children under two years old. It is generally the result of neglected or mismanaged fæculent or bilious diarrhœa. Indeed, any of the modifications of diarrhœa that have been mentioned, in this chapter, may degenerate into the present form of the complaint. It is usually of very protracted duration. It seldom destroys life in children before the third or fourth month; though the chance of a favorable termination, even under the most judicious treatment

after the disease has continued to this period, is generally very slender. So long, however, as the evacuations are free from purulent matter, and the febrile irritation has not assumed a hectic character, there is still considerable probability of success from a judicious and persevering course of remedial management. I have seen several cases of recovery after the disease had run on, beyond the sixth month.

In the former variety of chronic diarrhœa, as has already been stated the principal disease is seated in the stomach, small intestines, and liver, and consists more frequently of a high degree of irritability and irritation of these parts, than in actual inflammation; though this latter form of disease is often ultimately superadded. In the present variety of the disease the principal affection is seated in the colon, and consists of chronic inflammation, with or without disorganization or ulceration in the mucous membrane of this portion of the intestinal canal.

On post mortem examination, the mucous membrane of the colon, and ilium present distinct traces of inflammation. We sometimes discover a number of irregular patches of a fungoid appearance and of a dark or livid color, slightly elevated above the surrounding parts. In other instances, small well defined ulcers with elevated margins, or extensive irregular ulcerations with ragged edges are met with. The coats of the intestines, particularly those of the colon, are sometimes thickened at the parts where these ulcers are situated; and in some instances, this thickening is so great as to diminish the area of the intestinal tube very considerably. Instead of ulcers the mucous membrane, occasionally exhibits a great number of small tuberculous elevation. The appearances just mentioned are in general most conspicuous about the lower portion of the colon. The mucous membrane of the small intestines, is usually very much injected, presenting here and there extensive patches of a bright red appearance. The stomach seldom presents any decided traces of disease.

Treatment.—When diarrhœa has once acquired a chronic character, it is always of peculiarly difficult management. In the treatment of this form of diarrhœa, the attention must be directed, not so much to the mere diminution and suspension of the diarrhœal

discharges, as to the removal of that fixed morbid condition of the stomach and bowels, upon which the excessive evacuations depend. The excessive irritability, the inflammation, and the functional disorder of the liver and intestinal exhalents are the objects against which our remedial measures must be principally directed. One of the most important requisites, to the successful treatment of chronic diarrhœa, is a total avoidance of every kind of stimulating or solid aliment. In the "weaning brash," this precaution is, perhaps, not so uniformly indispensable as in the ordinary chronic diarrhœa, attended with mucous inflammation and ulceration of the colon. In this latter form of the complaint nothing can be effected without the strictest attention to this point. The nourishment must consist exclusively of thin mucilaginous fluids, such as gum-arabic water, barley water, very thin preparations of arrow-root, tapioca, sago, oatmeal gruel, and rice water. Not a particle of solid food, of any kind, should be allowed; and the patient should guard particularly against overloading his stomach even with the mildest kinds of nourishment. I have often known the best directed course of remedial treatment, frustrated by a neglect of this important point of practice in such cases. Milk seldom answers well in this disease. It is apt to coagulate, and to pass through the bowels in an undigested condition, appearing in the evacuations in the form of small white flakes. This, of course, always increases the intestinal irritation, and aggravates the tormina and frequency of the discharges. Beef or chicken tea and thin broths are, in general, still more objectionable, as they rarely fail to increase the intestinal irritation and rapidity and painfulness of the evacuations. So far as my own observation enables me to form an opinion, I am inclined to think that a very liquid preparation of tapioca, with infusion of slippery-elm bark for drink, forms the most appropriate artificial nourishment in cases of this kind. When the disease arises from weaning, however, nothing can be more appropriate and beneficial, than the milk of a fresh and healthy nurse. Speedy restoration of the child to the breast, will often, of itself put a stop to "weaning brash." Should diarrhœa of an obstinate character occur, while the child is still nourished at the breast, and there is reason to suspect some unwholesome condition of the milk, a fresh nurse

should, if practicable, be immediately procured. Even artificial nourishment, such as gum-arabic water, or very thin preparations of tapioca or arrow-root, would under these circumstances be preferable to the continued use of the unwholesome milk, by which the disease was excited. It is well, however, not to be very precipitate in separating the child from the breast in such cases; for, although it may be proper, and perfectly safe, to change the nurse when the quality of the milk is *suspected*, yet we ought to be well assured that this is actually the case, before the breast is entirely withheld, and the patient put on the exclusive use of artificial nourishment. Within the present year I was requested to consult in the case of an infant about nine months old, and not yet weaned. The child had been affected with diarrhœa, for more than four months. A variety of suitable remedies had been perseveringly used, but all to no purpose. We concluded to urge the immediate separation of the child from the breast, and to nourish it, exclusively with gum-arabic water, and thin tapioca. This was done, and under the use of this nourishment and minute doses of calomel and opium, the little patient was, in the course of about two weeks, freed from its dangerous malady. The treatment of chronic diarrhœa in children is often rendered extremely difficult and irksome, by the ignorance and perverse conduct of mothers and nurses. In despite of the most earnest injunctions to withhold every kind of nourishment but the simple mucilaginous fluids just mentioned, the little patient is often clandestinely supplied with what are deemed innocent delicacies, though in reality highly inappropriate and injurious. They cannot conceive that a "little soft cake," or a "bit of tender chicken," or some such article, could possibly do any harm. I have often been foiled in my efforts to cure cases of this kind, by this unwarrantable and pernicious departure from the directions that were given on this point; and the young practitioner ought to bear in mind, that unless this part of his curative plan is rigidly fulfilled, he can expect nothing but disappointment and defeat in his attempts to arrest the progress of the malady.

During the early stage of weaning brash, the liver and alimentary canal appears to be in the same condition as in common bilious diarrhœa. The stools are of a green, somewhat slimy and

curdled appearance, accompanied with frequent nausea and occasional vomiting. The principal objects to be kept in view in prescribing for the complaint at this period, are to correct the functional derangement of the liver and to allay the morbid irritability and irritation of the stomach and bowels. In the commencement of the treatment the intestinal canal should be freely evacuated by a moderate dose of calomel followed, in three or four hours, by a full dose of castor oil. After the purge has operated, the alimentary canal ought to be tranquillized by a suitable dose of laudanum or Dover's powder. To correct the morbid condition of the liver, and moderate the excessive irritability of the bowels, recourse must next be had to the regular exhibition of minute portions of calomel and opium. The fourth of a grain of the former with the twentieth of a grain of the latter, may be given three or four times daily, according to the age of the patient and the urgency of the symptoms. After these powders have been used for two or three days, another dose of castor oil with a few drops of laudanum should be administered. The occasional exhibition of a mild laxative is proper and beneficial; but a frequent repetition of active purgatives is calculated to do much injury in cases of this kind; and after the disease has acquired a strictly chronic character, even the mildest purgative remedies must be employed with great caution. The calomel may be continued until the bile becomes less abundant in the evacuations, and assumes a more natural appearance. It is to be observed, however, that in the employment of calomel, particular care is necessary lest it be carried to the extent of producing a decided mercurial action in the system—a result which is apt to give rise to very unpleasant consequences in children while dentition is going on. I have witnessed several very distressing instances of slaughing of the gums and general mercurial erethism, from the protracted use of calomel in chronic bowel complaints of children. When there are symptoms of acidity in the alimentary canal, alkaline and cretaceous remedies should be employed, along with the calomel and opium. From five to ten grains of prepared chalk, in union with half a grain of Dover's powder and a fourth of a grain of calomel, forms an excellent remedy in

such cases. The chalk may also be conveniently given in the form of a fluid mixture, thus:

℞ Cret. ppt. . . . . ʒii.
Sacch. Albi. . . . ʒi.
Mucilag. G. Arab. . . ℥ss.
Tinct. Opii. . . . gtt. xx.
Syrup Rhœi. . . . ʒii.
Aq. fontanæ . . . ℥ii.
M. f. Of this a teaspoonful should be given every two or three hours.

I have employed a solution of bicarbonate of soda, in a weak infusion of hops, with the happiest effect in this form of diarrhœa, when accompanied with acidity in the primæ viæ. At the same time that these remedies are employed, a stimulating plaster ought to be laid over the epigastrium, or frictions made with rubefacient liniments. A plaster made by melting equal parts of burgundy pitch and common diachylon plaster, spread on a piece of sheep skin, forms an excellent application for this purpose. The spice plaster, mentioned under the head of chylous diarrhœa, may also be used with advantage. Under the employment of these means, in conjunction with the most rigid adherence to a bland mucilaginous diet, this form of diarrhœa may often be subdued without much difficulty, when encountered at an early period, or before inflammation or structural lesion has taken place in the affected parts.

When the disease has acquired a strictly chronic character, and is accompanied with symptoms indicative of inflammation of the mucous membrane of the bowels, the treatment must be, in some degree, varied from that which has just been mentioned as appropriate, while the local affection consists, as yet, of simple irritation and functional derangement. The symptoms which indicate this aggravated state of the disease are; a frequent, quick, and sharp pulse, more especially towards evening, and an hour or two after eating; tenderness of the abdomen to pressure; small evacuations consisting chiefly of mucus, streaked occasionally with blood, and containing, at times, small masses of a cream-like or purulent matter, or very watery discharges, of a reddish color, with a large quantity of flocculent mucus, resembling the washings of flesh; a *red, raw, rough or glassy appearance of the tongue;* urgent

thirst; extreme moroseness and fretfulness of temper; rapid emaciation; and occasional circumscribed flush on one cheek; drawing up the legs towards the abdomen when lying down; and a peculiarly contracted and anxious expression of the countenance. When these symptoms are present, there can be no doubt of the existence of chronic inflammation in some portion of the mucous membrane of the bowels; and when the evacuations are very frequent, watery and whitish, and the emaciation is extremely rapid, we may presume that the mesenteric glands, also, are in a state of disease.

In this aggravated state of the disease, local depletion by leeching, and counter irritating applications are among the most useful remedies we possess. If leeches can be procured, two or three should be occasionally applied to the epigastrium, and a large emolient poultice laid over the abdomen after the leeches have been separated. Whether leeching be practised or not, active counter irritation ought never to be neglected in such cases. Very little, will be effected by internal remedies, without the concurrent aid of active irritating applications to the region of the affected organs. Blistering appears to me decidedly the best means of fulfilling this purpose. Pustulation with tartar emetic ointment, is apt to give rise to corroding and extremely painful ulcerations in infants. When the epispastic is properly managed it seldom occasions much suffering; and the derivative tendency of blistering is, probably, greater than that of any other application of this kind. The vesicatory should be removed as soon as the skin is reddened or slightly inflamed, which usually occurs, in about three hours, and a soft emollient poultice laid over the part. In the course of a few hours a fine blister will be raised, which is then to be opened and dressed in the usual manner. I have been in the habit of dressing blisters, in cases of this kind, with weak mercurial ointment, omitting at the same time the internal use of calomel, and, as it appeared to me, often with obvious advantage. Calomel, even in minute doses, if long continued, sometimes produces very unpleasant irritation, when the mucous membrane of the bowels is in a state of chronic inflammation. As the liver, however, is always in a very disordered condition, mercurials are obviously indicated; and hence, the use of mercurial ointment in

the way just mentioned, doubtless has a very beneficial tendency in this affection. I have known the continued application of large emolient poultices over the abdomen, without blistering, or any other mode of counter-irritation, to produce excellent effects in cases of this kind. The poultice should be renewed three times daily; and before a fresh one is applied, the skin ought to be washed with warm water, and afterwards rubbed with flannel until it is dry and somewhat reddened. I am persuaded, from what I have witnessed, that a diligent course of management, in this way, is calculated to do a great deal of good—as much, probably, as is usually derived from the more painful counter-irritating applications.

Among the internal remedies, opium, calomel, the sulphate of iron, and the nitrate of silver, appear to me the most valuable in this aggravated state of weaning brash. After the bowels have been gently evacuated by a dose of castor oil with a few drops of laudanum, small doses of calomel and opium should be given three or four times daily, until there is reason to think that the action of the liver has been improved. Much more caution is necessary in the use of calomel in this stage of the disease, than at an early period, before inflammation of the mucous membrane has taken place. When this tissue is in a state of chronic inflammation, calomel not only sometimes increases the local irritation, but is apt, when frequently used, to produce a general erethism of the system, which is always extremely unfavorable in its tendency. Calomel, indeed, can rarely have any direct beneficial operation upon the intestinal canal, when its mucous coat is in a state of chronic inflammation. Its usefulness under these circumstances depends on its well-known tendency to correct the morbid condition of the liver, and consequently to improve the vitiated or acrid biliary secretion. Opium may be very beneficially employed, throughout the whole course of the disease. I have more frequently succeeded in arresting the disease, in this stage, by the internal use of small doses of opium and sulphate of iron, in conjunction with the external means mentioned above, than by any other remedy. After the morbid condition of the liver has been, in some degree, corrected by small doses of calomel and opium, the sulphate of iron may be very advantageously substituted for

the calomel. A powder composed of the twentieth of a grain of opium, the eighth of a grain of sulphate of iron, and five or six grains of powdered gum arabic, should be given three or four times daily according to the age of the child. Harsh and inappropriate as the nitrate of silver may appear to be, in cases of this kind, I have, nevertheless, in a few instances, found its internal administration to produce the happiest effect. In an extremely severe case of chronic diarrhœa, which commenced in the usual way of weaning brash, and which was evidently attended with chronic inflammation, and, as it seemed to me, ulceration of the mucous membrane of the colon, I administered this article in union with laudanum, with prompt and decided benefit. One grain of the nitrate was dissolved in an ounce and a half of gum-arabic water, to which twenty drops of laudanum were added. A teaspoonful of this solution was given three times daily. The discharges soon became less frequent and of a better appearance; and under the continued use of this remedy, together with blisters dressed with weak mercurial ointment, and the mildest possible nourishment, the disease gradually yielded, until it was finally entirely subdued. The patient was about eighteen months old. In several other instances of a similar character, this treatment was attended with unequivocal advantages; and I have never known the slightest inconvenience to result from the use of this article in chronic mucous inflammation of the bowels, when administered in a mucilaginous solution and in very small doses. In cases of this kind, the nourishment should consist exclusively of barley-water, a solution of gum arabic, infusion of slippery elm, the mucilage of iceland moss, and a very liquid preparation of arrow-root. The smallest portion of solid food, will generally do more harm, in a few hours, than can be remedied in several weeks. In this advanced stage of the disease, purgatives ought to be employed with the utmost degree of caution. Dr. Dewees advises that "small but *repeated* doses of castor oil should be given." I cannot but regard this advice as decidedly injudicious, and calculated, if followed up, to do much mischief. In ordinary cases of diarrhœa, depending on simple irritation from offensive substances lodged in the bowels, repeated purging is often indispensable. In such cases, the principal objects are—to remove

the irritating substances out of the bowels by laxatives, and to allay their inordinate irritability by opiates. In the present form of diarrhœa a very different state of things obtains. The mucous membrane of the bowels is inflamed, and perhaps ulcerated. The diarrhœal discharges depend on this diseased condition of the intestines, rather than on the acrid secretions which are poured into them. It could hardly be expected therefore, that any advantage would result, from frequently irritating the inflamed mucous membrane and urging the already too greatly excited peristaltic action of the bowels, by purgatives. In the chronic diarrhœa of adults, accompanied with mucous inflammation of the colon, no prudent and experienced physician, certainly, would resort to "repeated doses of castor oil." I have repeatedly witnessed the pernicious consequences of this practice in cases of this kind. I do not mean to object to the *occasional* administration of a moderate dose of castor oil with a few drops of laudanum. If the dose be repeated once every three or four days, and laxative enemata employed, during the intermediate periods, the bowels will be kept in sufficient motion to prevent the undue retention and accumulation of acrid secretions in them.

It may be objected to the preceding observations, that if articles so corrosive and active as lunar caustic, and the sulphate of iron, may be given with advantage in this complaint, no harm can be reasonably apprehended, from the mild impressions of castor oil, or other gentle purgatives. This argument, however, is not supported by experience. There is something very peculiar in the impressions made by these articles. The nitrate of silver, especially, though a highly active irritant, often exerts a peculiarly soothing and alterative effect on inflamed surfaces. In certain varieties of ophthalmia, this article is pre-eminently useful; yet were castor oil or rhubarb applied to the eye, the inflammation would, undoubtedly, be greatly increased. It is not the strength but the character of the irritant that renders it either salutary or hurtful in certain affections. Purgatives excite the intestinal nerves and increase the peristaltic action; lunar caustic and the sulphate of iron, not only excite, but *change* the sensibility and irritability of the inflamed mucous membrane of the

bowels, and thus contribute essentially to the reduction of the inflammation.

In the chronic diarrhœa of adults, the sulphate of copper, has, within the last four or five years, been employed in Europe with entire success. When the inflammation and ulceration is chiefly, if not wholly, confined to the colon, this article sometimes produces a very good effect. I have used it in a few instances, of this kind, in adults, with unequivocal advantage. It is not improbable that it might be used with equal benefit in the chronic diarrhœa of children—more especially in the second variety mentioned in the former part of this section, and which does not differ, in its pathological character, from the ordinary chronic diarrhœa of adults. This modification of the complaint, as has already been observed, is generally the result of neglected or mismanaged acute diarrhœa, and is seldom met in very young infants. The stools are slimy, usually streaked with blood, often attended, with a slight feeling of tenesmus, or with considerable straining, and almost invariably conspicuously mixed with purulent matter. In such cases, besides the remedies already mentioned as applicable in chronic diarrhœa, the sulphate of copper, may be tried. It should always be given with opium. The one tenth of a grain, with the fifteenth of a grain of opium, may be given every morning, noon, and evening; and the proportion of the sulphate ought to be gradually increased, until it is found to produce nausea or vomiting. The balsam copaiva, too, may sometimes be used with decided benefit in such cases. I have used this article repeatedly in the chronic bowel complaints of children, and occasionally with considerable advantage. It should be given in the form of emulsion and in union with small doses of laudanum. Five or six drops of the balsam, with a drop or two of laudanum should be given three or four times daily. In cases of this kind I have seen much good done by a decoction of the *conferva helminthocordon.* I am satisfied that this is a valuable remedy in certain varieties of protracted diarrhœa. Where there is reason to suspect the presence of verminous irritation, this article is, probably, the most useful remedy we possess. It has, pretty active vermifuge powers, and by the small portion of iodine which it contains, may operate very beneficially

on the liver and mesenteric glands. Be this as it may, I have witnessed its good effects in several very long-standing cases, after various other remedies had been used without any manifest advantage. Two drachms of the conferva should be boiled in half a pint of water, down to four ounces. The dose of this is a teaspoonful three or four times daily, and I have usually added about a tenth of a grain of the sulphate of iron to each dose. Diarrhœa, of a very obstinate character, alternating, however, with occasional short periods of costiveness, sometimes arises from the presence of worms in the bowels. These cases are, almost without exception, attended with a tumid and hard state of the abdomen, slimy evacuations, a peculiarly offensive breath, a pale countenance, voracious appetite, and frequently with tumefaction of the upper lip. As instances of this kind are not necessarily, or even generally, connected with mucous inflammation of the bowels, recourse may be had to pink-root tea, or to small and repeated doses of calomel followed by an active purgative. My own experience, however, has led me to prefer a decoction of the helminthocordon, in cases depending, or connected with verminous irritation, to any other remedy I have tried.

Astringent and cretaceous remedies are not, in general, calculated to do good in chronic diarrhœa. When there is mucous inflammation or ulceration present, they seldom fail to do manifest harm. After the local affection has been subdued, and the fæculent and copious diarrhœal discharges result from weakness and relaxation of the bowels, vegetable astringents will sometimes operate very favorably. So long, however, as the evacuations are small, slimy, streaked with blood, or mixed with purulent matter, remedies of this kind are wholly inadmissible. During convalescence, they may sometimes be proper; but very rarely, if ever, during the active stages of the disease. The blackberry root, or the root of geranium maculatum, are among the best, if not the very best astringents we have, for purposes of this kind.

CHAPTER XXI.

OF INTESTINAL WORMS.

Concerning the origin of intestinal worms, much has been conjectured, but little ascertained. It is a subject, by no means unworthy of particular research; for beside the interest it possesses in the eye of the naturalist, it has peculiar claims on the attention of the physician. An exact and complete knowledge of the sources and generation of these animals, might furnish materials for a certain prophylactick mode of treatment. As the inquiry, however, does not come properly within the design of this work, we will not enter into an extensive examination of the various notions, that have been started with respect to the formation of worms, but briefly notice the two hypotheses, which are supported by the greatest number of probabilities.

The first of these is framed in accordance with the ancient dogma, *omnia ex ovo*, and derives its principal evidence from the analogy of nature, and the inadequacy of any other mode for explaining the origin of intestinal worms. According to this notion, these animals are evolved from ovula, received into the stomach and bowels from without, along with the food and drink. It may be remarked, that the theory necessarily involves the supposition of the existence without the body of worms, by which these ova are generated, and which are similar to intestinal worms. But the most accurate observation is in contradiction to this supposition. The few earth-worms, resembling tœnia and ascarides, are of very rare occurrence and only to be met with in certain localities; whereas these species of vermin are common both to man and the inferior animals, in all countries and every variety of situation. Linnæus, Gmelin and a few others report, indeed, that they have discovered similar worms in stagnant waters and marshes; but the ablest helminthologists of the present

day, assert, that they are quite dissimilar, in structure and habits, to those generated in the intestines of animals. Moreover, intestinal worms, when expelled from the body, and exposed to the air or placed in water, almost immediately die—a circumstance hardly to be looked for, if originally derived from without. Finally, it is ascertained, that earth-worms and such as live in water, do not change their forms or characters, when accidentally received into the alimentary canal. Instances have been mentioned, of various aquatic animals being taken into the stomach, where they have thriven so wonderfully as hardly to be recognized as individuals of the different species to which they naturally belonged. In all these cases, however, the change was in their magnitude, not in their structure and essential nature. These facts go to prove that intestinal worms constitute an entirely distinct species from all others, and it therefore, becomes rather a perplexing task, for the advocates of the ovular theory, to point out the sources whence the verminous ova are derived.

But there are other difficulties in the way of this hypothesis. Cases, on the best authority, are recorded of worms found in the intestines of fœtuses, and of infants newly born. Kerkringius discovered lumbrici in the stomach of a seventh month fœtus: in another instance, he found a great number of small worms in the bowels of a child, just after birth. A tape worm, as Pallas states, was found, by Brendel, in the intestines of a newly-born infant; and according to the testimony of Block, Hains met with a similar instance. Tænia have been discovered in the bowels of a pup, immediately after birth, as in the case stated by Rudolphi to have occurred under the notice of the celebrated Blumenbach. It is also on record, that a fasciola hepatica was detected in a lamb still in utero. The fact, too, that hydatids and other animals are not unfrequently met with in parts of the body, that can have no communication outwardly, discountenances the ovular hypothesis.

A view of these difficulties has contributed to turn the attention of many ingenious men to the doctrine of the spontaneous generation of worms within the body. This doctrine is chiefly sustained by the facts we have just mentioned, as militating against the notion of verminous generation from extrinsic ova.

That the ovula of worms should be transmitted through the medium of the ingesta, Dr. Bremser thinks altogether improbable. An experiment, performed by Schreiber, is also adduced by him in support of the hypothesis of spontaneous formation. A pole-cat was fed for six weeks upon milk, containing the eggs and various species of intestinal worms. The animal being killed at the end of that period, to the astonishment of all, not a single worm could be detected in his body.

The advocates of the ovular theory, in attempting to obviate the difficulties that beset their opinions, and to combat the adverse hypothesis, contend, that there is no improbability in supposing, there may be a transmission of eggs through the medium of air, food and drink. As to Schreiber's experiment, they deem it quite inconclusive. Other circumstances, beside the mere presence of the ova, are necessary to the formation of worms. The intestines must be so debilitated or disordered, that they shall be unable to destroy and cast off these parasitic animals. Now in the experiment related, the stomach of the pole-cat was in its usual healthy condition—at least there is no reason to believe otherwise. It is further remarked, there are positive experiments to prove that worms may be propagated in the human body. Pallas, by a small incision, introduced into the cavity of a dog's abdomen, the ova of tænia, from the bowels of another dog. At the end of a month young tænia were thriving in the cavity. In this case, they were not checked in their developement, by the active powers of the alimentary canal, nor liable to be thrown off by its healthful motions. The case of hydatids and other animals, found in the close cavities of the body, is acknowledged to present considerable difficulties—not so many, however, it is said, as surround the hypothesis of a spontaneous formation. Besides, it is quite possible, they remark, that the eggs from which these verminous animals are generated, after being received into the system, may, from their extreme minuteness, have been taken up and carried away by the absorbents, to the different parts of the body, where they are found in their developement. The same remark is applicable to instances of worms discovered in fœtuses. Owing to the intimate communication established between the mother and the child, in utero, the

diseases of the parent not unfrequently become the diseases of her offspring—and peculiarities of physical and moral constitution are also transmitted. Why then, it is asked, may not the ovula of worms, received into the system of the mother, be taken up by the absorbent vessels, and after passing into the circulation, be ultimately deposited in the bowels of the fœtus? The difficulty, growing out of the distinct specific nature of intestinal worms, they attempt to lessen, by supposing, that a change in situation and mode of living may so far alter the external appearance of these worms, as to conceal their real character.

Such are the principal grounds, upon which the two hypotheses stand. I will leave the student to make up his own opinion on the subject, with a single remark in particular reference to the notion of a spontaneous formation. It appears to me that an erroneous sentiment of religion and the force of long-received opinions, —in other words, that partial views of the economy of nature, as also an undue deference to authority,—have exerted too much influence over the enquiries of men, touching this subject. The ancient dogma, omnia ex ovo, unquestionably true in the general, is deemed by some universally so; although it is manifest it should not be extended beyond the experience upon which it is based. If then, certain remarkable phenomena should be observed, by no means in accordance with the general theory, analogy should not be a sufficient reason to make us doubt the evidence of our senses, and believe in opposition to facts, that such exceptions are not real, but apparent.

Species of Intestinal Worms.—There are five distinct species of intestinal worms.

1. *The tricocephalus dispar*—(*Trichuris—tricocephalus hominis,—ascaris trichuria*).—This worm, called by the English *the long threadworm*, is from an inch and a half to about two inches in length. About two thirds of its length is as thin as a horse hair, the remaining and posterior part being considerably thicker, terminating in a rounded or blunt extremity. The thin part is transversely striated; and the alimentary canal may be seen, by means of a lens, running from its thinner extremity in a direct line through the centre, into the thick posterior portion, where it

assumes a flat and spiral form. These worms are seldom numerous, and are principally found in the cœcum. They have been discovered in the rectum, and some say they have met with them in the jejunum.

2. *Ascaris vermicularis.*—(*Oxyuris vermicularis—fusaria vermicularis—mane or thread worm*).—This is a very small white worm —the male being not above two lines in length, with a rounded or blunt extremity anteriorly, tapering to a point posteriorly. The female is considerably larger, being from four to five lines in length, terminating in an extremely fine extremity posteriorly, resembling the point of the finest needle. These worms are found only in the large intestines, and principally in the lower part of the rectum, where they are often congregated in almost countless numbers. The reports, that have been made, of their existence at times in the ventricles of the brain may be justly discredited.

3. *Ascaris lumbricoides.*—(*Fusaria lumbricoides—lumbricusteres*). These worms are from two or three to ten or twelve inches in length, round, of a yellowish white or brownish-red color, of nearly a uniform thickness, except at the extremities; which taper to a blunt point. They are from two to three lines in thickness. The head may be distinguished by a circular depression within a line of one of the extremities, terminating in three small tuberosities or valves, which the worm has the power of opening or closing. When they are opened, a very minute patulous projection may be seen, which constitutes the mouth of the worm. A very small groove passes longitudinally from one extremity to the other, on both sides. The alimentary canal terminates in a transverse depression on the under surface, near the posterior extremity. The male is smaller than the female, and may be distinguished by its shortly curved caudal extremity. In some instances the organs of generation are conspicuous—consisting of two small cylindrical projections in the curved part of the tail. These worms inhabit the small intestines, and occasionally ascend into the stomach. It is said, too, that they have been discovered in the gall bladder and common bile duct.

4. *Tænia lata.*—(*Bothriscephalus latus—tænia membranacea—t. vulgaris*).—This worm often acquires a very great length,—from thirty to forty feet and more. It is from four to ten lines in

breadth, flat, white, and composed of a series of concatenated joints, resembling a piece of white tape. The head is armed with two processes, by which the worm attaches itself to the intestines. It inhabits the upper portion of the bowels and the stomach. Three or four of these worms sometimes exist in the same person. Where they prevail, the tænia solium is seldom met with.

5. *Tænia solium.*—(*Tænia cucurbitini—t. osculis margin-albius.*) This worm is rarely, if ever, voided whole. It is passed off in pieces of a greater or less number of joints, or in single joints, bearing considerable resemblance to the seeds of *gourd.* Pieces, however, upwards of twenty feet in length, have been discharged, although generally not more than three or four joints, pass off together. The anterior part tapers off into a very fine, thread like extremity, the head being extremely small, and furnished at its sides with four small apertures (*oscula*). This is the most common species of tape-worm, and like the tænia lata, inhabits the stomach and small intestines. The name would indicate that one worm alone inhabited the bowels of the same individual; but this is not so, two or three frequently being voided by the same person.

Circumstances, favoring the generation of intestinal worms.—Although unenlightened with regard to the origin of these parasitic animals, observation has revealed to us many of the circumstances, that favor their production and increase. The principal of these are, a general debility of the system, and a feeble or deranged condition of the alimentary canal. Whatever, therefore, disposes to these states, constitutes a remote cause of worms,—such as, too rapid growth; scrofula; a sedentary and an inactive mode of life; habitual exposure to a damp atmosphere; indulgence in crude, unripe fruits; the abundant use of fat, and farinaceous articles of diet, and of fresh milk; the ingestion of more food than the stomach will readily digest, or than is necessary to the wholesome sustenance of the system. Dr. Bremser asserts, that all esculent articles, containing an abundant proportion of nutritive matter, will when taken in quantities more than sufficient to minister to the necessities of life; greatly favor the form-

ation of worms. Sugar by some has been thought to aid largely in the development of these animals; but this has been denied by others who have enjoyed equal opportunities of correct observation.

That verminous diseases have ever prevailed as epidemics, is, by some, denied and not unfrequently ridiculed. Why the statement should have excited ridicule, we are at a loss to discover; since there certainly can be no absurdity in the notion, that peculiar atmospheric conditions may at times prevail throughout large districts of country, affecting the intestinal canal in such a manner, as shall particularly dispose it to favor the generation of worms. Besides, if the concurrent testimony of many very eminent authorities is to be believed, we shall be obliged to admit the actual occurrence of such epidemics. A very remarkable instance of this kind is related by Mariè, which occurred at Ravenna and the surrounding district. Block has also given an account of an epidemic worm-fever.

In some countries, verminous affections prevail far more than in others. In Savoy and Chambray intestinal worms are said to be remarkably common in all classes of society, (Daquin, Bremser,) and the same observation has been repeatedly made of Holland and Switzerland. The prevalence of verminous disease, in the latter country is ascribed by Bremser to the abundant use of milk and cheese. Nevertheless we may be said to be ignorant of the various circumstances that occasion the spread of these diseases in particular districts. Holland, in climate and situation, differs entirely from Switzerland, being low, flat, moist and marshy; and moreover, fish enters largely into the diet of the inhabitants. Still we find the Swiss peasant, living amidst rugged Alps, and "breathing the difficult air of the iced mountain's top," equally liable with the Hollander to verminous complaints. It is thought by some that worms are more prevalent in cities than in the country; and Pallas believes that carnivorous animals are more subject to them than those of the graminivorous sort. Bremser states on the other hand, that it is no unfrequent circumstance to find large numbers of worms in the intestines of those animals, that subsist principally on vegetables. The greater prevalence of verminous affections in cities, is attributed, by him, to the larger

proportions of causes, tending to enfeeble or deprave the general system, and derange the digestive functions—such as impure air, deficient exercise, luxurious living and irregular habits. It has already been remarked that an over nutritious diet tends to produce worms, but a deficiency of nutriment would not seem to occasion the same result.

Different districts of country are liable to the prevalence of different species of worms. The occurrence of the tape-worm is particularly common both in Switzerland and Holland; and it is worthy of remark, that, in the former country, the bothriocephalus latus is by far the most frequently met with. In Germany, the greater part of France, in Italy and even in the Tyrol, the tænia solium is almost the only species of tape-worm to be found. In Sweden, according to Rhudolphi, the broad tape-worm occurs but rarely, but the tænia solium is of frequent occurrence. This latter species prevails also most frequently in Great Britain, although the former sort is not seldom met with. (Rhind.) The Guinea worm, infesting the sub-cutaneous cellular tissue, is confined to tropical countries: although brought into the temperate regions, by persons afflicted with it, it has never there become a prevailing affection.

Childhood is the period of life, especially subject to verminous disease. The tape-worm, however, is generally the pest of riper years. As a general rule, those children, who are confined altogether to their mother's milk, suffer least from worms. Dr. Dewees declares, that he has never seen worms in children under ten months of age, and only in two instances of that age, both of whom were weaned at four months.

Symptoms.—The symptoms, arising from verminous irritation, are as numerous and diverse, as the sympathies that subsist between the alimentary canal and the different parts of the body. It is on account of the variety and complexity of these sympathies, and because we have no certain means of indicating the specific marks of verminous irritation, that the symptomatology of worms is so imperfect. The only sure indication of their existence, is their appearance in the evacuations. Nevertheless, there are many symptoms that will lead the judicious practitioner

to suspect their presence and prescribe accordingly. The countenance is pale and leaden-colored, with occasional flushes, or a circumscribed spot of red in one or both cheeks; the eyes become dull; the pupils dilate; an azure semicircle runs along the lower eye-lid; the nose is irritated, swells and sometimes bleeds; there is tumefaction of the upper lip; occasional head-ache, with humming or throbbing in the ears; an unusual secretion of saliva; slimy or furred tongue; breath very foul, particularly in the morning; appetite variable,—sometimes voracious, with a gnawing sensation of the stomach; at others, entirely gone; fleeting pains in the stomach; occasional nausea and vomiting, the matter thrown up, being limpid like water; violent tormina throughout the abdomen, particularly about the umbilical region; bowels irregular—at times costive, and then disposed to frequent dejections; stools slimy, not unfrequently tinged with blood; belly swollen and hard, attended with emaciation of other parts of the body; urine turbid, yellowish or—after depositing a sediment, has the appearance of milk and water, (Rhind); respiration, occasionally difficult and accompanied by hiccough; sometimes cough, dry and convulsive, stertorous or suffocating; uneasy and disturbed sleep, with grinding of the teeth; temper variable, but generally irritable. Of all these, the most infallible symptoms are by some supposed to be, unusual enlargement of the pupil; voracious appetite; inordinate secretion of saliva; emaciation; pricking sensation of the stomach; swelling and hardness of the abdomen, and loathing of food. Nevertheless, all these symptoms may arise from other affections. According to Rosenstein, the surest indication of their presence, is the uncomfortable sensation experienced by the patient after a draught of cold water, and voiding some worms or fragments of worms. There can, of course, be no doubt as to the infallibility of the latter symptom.

It has been fancied by some persons, that worms perform very wholesome offices in the animal economy, consuming the superabundant nutriment, destroying morbid secretions, and stimulating the intestines to the expulsion of ungenial substances. But daily experience and correct observation teach, that these are but imaginary benefits, whilst the evils they inflict are exceedingly mischievous and almost inevitable. Undoubtedly it may have

happened, that many disorders have, without any foundation, been ascribed to verminous irritation; for the etiology of disease is by no means a certain science. Besides, the same condition of the intestinal canal, that favors the generation of worms, may be the principal source of many of the complaints, co-existent with the presence of these animals. That verminous irritation, however, is sometimes the direct and exclusive exciting cause of severe and dangerous disorders, we may not disbelieve. Chorea, epilepsy, hydrocephalus, emaciation, convulsions, paralysis, fevers, dropsy, mania, and a vast variety of anomalous affections, are at times the immediate consequences of verminous irritation, and frequently disappear after the expulsion of the worms. Esquirol knew eleven persons cured of mania by the expulsion of a large number of lumbrici. Brera states, that a lumbricoides in the urinary bladder, produced nephritis and fatal disease of the bladder. The same author narrates, a case in which pains in the joints, similar to those of arthritic rheumatism, were occasioned by worms in the intestinal canal. The pains immediately ceased upon the expulsion of nine large lumbricoides. The presence of worms sometimes induces singular idiosyncrasies. An instance is recorded of a patient, afflicted with tænia and ascarides, to whom the sound of music, instrumental or vocal, was quite intolerable. Another case is related, where a person, in a convulsive fit from verminous irritation, heard by accident some musical sounds, and was immediately cured.

Treatment.—In prescribing for intestinal worms, we should have strict regard to the regimen, confining the patient to a spare and liquid diet, and exhibiting two or three mild purgatives, a few days previous to the administration of anthelmintic remedies. These preparatory measures are calculated to secure success more frequently, from the employment of the ordinary vermifuges.

Lumbricoid.—My own plan of management for the expulsion of the long round worm, is to put the patient on a liquid diet, and to order him a small dose of epsom salts every morning for three or four days. On the fourth morning, I direct a decoction of the

root of spigelia, in the proportion of an ounce of the root to a pint of water, boiled down to a half pint. This, being sweetened, is to be drunk in the course of three or four hours, by a child of from five to ten years old, commencing in the morning after having taken a little milk and water into the stomach. As soon as the whole of the decoction is taken, an active dose of calomel and jalap is to be administered, or a dose of castor oil and turpentine, in the proportion of half an ounce of the former to two drachms of the latter, given in doses corresponding to the age of the patient. I have rarely failed by this plan, to procure the discharge of worms, where they existed in the bowels. The remedies and modes of treatment, recommended for the expulsion of this species of worms, are almost innumerable. A few of them deserve our attention. According to Bremser, the electuary appended below* is highly efficacious as a vermifuge. It is to be given to a child in doses of a teaspoonful, every morning and evening for six or seven days. I have used this electuary in four or five cases, with complete success. Exhibited to such an extent as to produce frequent and watery evacuations, it does far less good, than when managed so as to procure three or four consistent stools daily. The empyreumatic oil of Chabert† has obtained great celebrity in Europe for its anthelmintic properties, especially in respect to tænia, and is indeed universally used on that continent. Bremser and Brera speak very highly of its virtues, and Rudolphi asserts, that it is decidedly the most efficacious vermifuge we possess. Fifteen or twenty drops may be taken three or four times daily, by children from two to seven years old. Small doses of

* Sen. Santonic.	℥ss.
Pulv. root valerian.	ʒii.
" " Jalapæ	ʒss—℈ii.
Snlphat. Potassæ	ʒiss—ʒii.
Oxymel. Scillit.	q. s.
ut fiat electuar. M.	

† This oil is made by mixing one part of the fetid spirits of hartshorn with three parts of the spirits of turpentine, and suffering them to digest for four days. The mixture is then to be put in a glass retort, and distilled in a sand bath, until three fourths of the whole have passed over into the receiver. This is to be kept for use in small and well closed phials.

calomel, with the powdered roots of spigelia and valerian, may be employed with advantage. Calomel, however, given in this way, is apt to produce ptyalism, especially as it is necessary to continue its use for several days, to insure its anthelmintic action. The chenopodium anthelminticum is well known in this country, as a vermifuge. By means of syrup, an electuary is sometimes made of the powdered seeds, and given, in doses of a tablespoonful, to a child of from two to five years old, twice a day—care being taken to abstain from food several hours. It is generally necessary to repeat the dose four or five days. Beside these articles, the most efficacious medicines, for the destruction and expulsion of the round worm, are—sem. santonic.; garlic; conferva helminthocordon; spirits of turpentine; geoffrea surinamensis; camphor; the green rind of unripe walnuts, and tin filings.

The expulsion of lumbrici is not, in general, a very difficult task. But to accomplish this desirable object completely, we should persist for a considerable time in the use of anthelmintic remedies, so as not only to destroy the already existing worms, but the eggs containing the germs of others. Their expulsion being effected, strict regard should now be paid to preventing a reproduction of them. In view of this object, the patient should attend particularly to his diet, living abstemiously on plain food. A free indulgence in saccharine matter, in milk, cheese, or butter, must be forbidden. Animal food ought to enter largely into the diet. Whatever tends to invigorate the general system, and bestow a wholesome energy on the stomach, should be carefully enjoined. Recourse must be had to tonics, particularly chalybeates, in conjunction with minute doses of aloes. A strong decoction of the helminthocordon has appeared to me, not only valuable as a vermifuge, but particularly so, as a corrective of that deranged and debilitated condition of the alimentary canal, favoring the production of worms. An ounce of this marine vegetable, with a drachm of valerian, should be boiled in a pint of water down to one gill. Of this a teaspoonful may be given every morning, noon and evening, with peculiar advantage. I have known several instances, in which children, apparently suffering from verminous irritation, were restored to perfect health by the use of this remedy, without any appearance of worms in their ex-

cretions. It is particularly beneficial in cases attended with the usual symptoms of worms, connected with want of appetite and mucous diarrhœa, which arise from mere debility of the digestive organs and a vitiation of the secretion of the bowels.

Ascarides.—These worms, in general, are extremely annoying. From their being involved in the folds at the lower part of the rectum, they frequently give rise to inflammation of the anus, tenesmus or hæmorrhoids. During the day, they are seldom a source of much uneasiness; but towards evening, and especially after lying down, they occasion a tormenting, an almost insupportable irritation and titillation about the anus. So distressing indeed is the irritation, that nervous children are not unfrequently thrown into convulsions thereby. In females, they sometimes pass into the vagina, giving rise to extreme uneasiness. Doctor Bremser states, that he knew a case of nymphomania, occasioned by their presence in that passage. They have also been known to enter the bladder and urinary passages. They are generally more troublesome in damp than in dry weather.

The complete removal of these worms is a work of great difficulty. They are so wonderfully reproductive, that no matter though thousands be brought away, we may soon have to recommence our task. The ordinary vermifuges, too, are of little avail in the destruction of ascarides. Their action is more particularly exerted upon the upper portions of the intestinal tube, and at all events lose their virtues before they arrive at the location of these animals. Even the most active cathartics are insufficient to expel them. Aloes, however, from the peculiar influence it exerts over the lower portion of the bowels, frequently causes their expulsion in large quantities, especially if assisted by the action of proper enemata. My usual mode of proceeding for the removal of these troublesome worms, is to prescribe three or four aloetic purgatives every second day, together with two or three enemata, composed of a mixture of lime-water and milk, in equal proportions, daily. Injections of a solution of aloes, or of infusions of any of the abovenamed vegetable anthelmintics, will generally succeed in bringing away great numbers of these little animals. In a few instances, I have procured their expulsion in large quantities, by injections, composed of spirits of turpentine, mixed with milk, in

the proportion of a teaspoonful of the former to a gill of the latter. Injections of any of the common oils will oftentimes soothe the extreme irritation, and also destroy the worms. According to Nil Rozen, a drachm of refined sugar, dissolved in warm milk, has been injected with great success. Another remedy, highly spoken of, is a bougie, smeared over with mercurial ointment, and introduced into the rectum. Dr. Vanvert asserts, that flowers of sulphur, taken in the morning on an empty stomach, is one of the most efficacious remedies for the destruction and expulsion of ascaridies. In obstinate cases, the fumes of tobacco, or an infusion of the male fern, has been recommended by Dr. Bremser. When these worms have crept into the vagina, the same author states, that injections of cold water, with a small portion of vinegar, is the best remedy we possess.

As tænia occur chiefly in the adult, their treatment does not come properly under notice in this work.

CHAPTER XXII.

OF OPHTHALMIA.

Purulent Ophthalmia.—The purulent ophthalmia of infants, generally commences between the fourth and eighth day after birth, though instances of its coming on at a more advanced period are occasionally met with. At first the eye-lids are observed to be glued together, in the morning attended with slight swelling and external redness. If the lid is raised, so as to expose its conjunctional surface, it is found of a uniformly red and slightly thickened appearance. As the disease proceeds, the swelling of the eye-lids increases; a thick purulent matter begins to issue from the eyes; the child becomes fretful and uneasy, and manifests much intolerance of light, keeping its eyes constantly and firmly closed. In the course of three or four days the conjunctiva becomes highly inflamed and œdematous—rising up around the cornea, so as almost to conceal it, or causing it to appear as if it were sunk deep into the eye. The secretion of pus is now extremely copious, and being confined under the swollen and firmly closed lids, it bursts forth, from time to time, and runs down the cheeks in large drops. If the disease be not arrested, the lids become distended to the utmost degree, giving rise, sometimes, to eversion and consequent bulging out, or protrusion of the inflamed and highly infiltrated conjunctiva. The cornea, also, has by this time become implicated, and is more or less opake. Should the disease continue, corneal ulceration and sloughing takes place, the aqueous humor escapes, and a total destruction of the organ ensues. Mr. Guthrie states that there are two varieties of infantile, purulent ophthalmia. In one, the inflammation is seated almost exclusively, in the conjunctiva of the lids; whilst in the other variety, the conjunctiva of the eye-ball is equally implicated in the disease. I have repeatedly noticed these diversities in the

suppurative ophthalmia of infants. When the inflammation is confined to the lids, the disease seldom leads to any very serious injury to the eye; but it is, in general, quite as obstinate, and difficult to be subdued as the latter variety of the complaint.

The exciting cause of the suppurative ophthalmia of infants appears to consist of some acrid or morbid secretion in the vagina of the mother, applied to the infant's eyes during its passage from the womb into external life. I have never met with an instance of this disease, where upon enquiry I did not learn that the mother was affected with leucorrhœa or some other morbid vaginal secretion. The tendency of gonorrhœal matter, when applied to the eyes, to excite purulent ophthalmia is well known: and I have witnessed some striking examples of the same effect, from the application of leucorrhœal to the eyes, in adults. The fact, too, that the matter discharged from the eyes in cases of this kind, is capable of producing the same disease when applied to the eyes of others, furnishes strong testimony in favor of this etiology of the disease. Mr. Ryall, whose opportunities for observation on this subject have been very extensive, states, that he has frequently known purulent ophthalmia excited in nurses, "by the accidental application of the matter from the infant's eyes to their own." The time of its occurrence, also, affords some evidence of its dependence on a cause, connected in some way or other with the birth of the infant. If the disease were excited by intestinal irritation from bile and sordes in the alimentary canal, as some have supposed, it would, doubtless occur at every stage of infancy; whereas, its occurrence is almost universally confined to the two first weeks after birth, and in a vast majority of cases, comes on as early as the fourth day. This disease has also been ascribed to the "too early and unguarded admission of light and heat to the eyes of the new-born infant."* The great and sudden transition from the darkness of the womb to the external light, from the contact of the bland and congenial liquor amnii, to that of the atmospheric air, may, perhaps, at times operate injuriously on the tender eyes of the infant. It may be observed, however, that the good and all-wise author of nature, has endowed every

* Edin. Med. and Surg. Journal. vol. 4. p. 247.

creature with a capacity to accommodate itself to the inevitable changes and transitions, which it is destined to undergo, in the regular progress of its development, and it seems inconsistent with the perfect adaptation of the appointments of Providence that the new-born infant should be liable to serious inconvenience or injury from this cause. It cannot be doubted, indeed that unnecessary exposure of the infant's eyes, to a bright and heated light, may do much mischief. The practice of taking the infant, as soon as it is born, before a blazing fire, with perhaps a candle at no great distance, and keeping it "in this situation, not only during the time necessary for dressing, but often, long after this task is performed, lying on its side, on the nurse's knees, and with the face turned to the fire," is unquestionably very improper, and may be the source of much injury to the eyes.

Treatment.—Whenever there is reason to suspect the existence of some morbid vaginal secretion, more especially gonorrhœal, on the part of the mother, the infant's eyes ought to be immediately washed, in the most careful manner with tepid water. The water should be frequently changed and freely applied, so as to ensure the entire removal of the irritating matter that may adhere to the eyes. In all instances, care should, also, be taken, that the infant's eyes be not immediately exposed to a very strong light; for, although this may not, of itself, be capable of exciting this disease, there can be no doubt of its tendency to irritate the eyes, and to favor the occurrence of inflammation from other causes. By these precautionary measures, the disease may often be prevented, even where the most active virus has been applied to the eyes during the birth of the infant.

As the inflammation, in this affection is always very violent and rapid, the treatment during the early stage must be strictly and actively antiphlogistic. If leeches can be procured, two or three should be applied to the external angle or on the under lid of each eye; and the bleeding from the leech-bites should, afterwards, be promoted by warm fomentations or by the application of a soft emolient poultice over the eyes. The child should be kept in a dark room, and when the blood has ceased to ooze from the leech-wounds, the poultice and bandages must be removed,

and a thin and soft piece of linen, constantly kept moist with a weak solution of the sugar of lead, laid over the eyes. The eye-lids must be prevented from adhering to each other, by washing the tarsi frequently with tepid water, or with thin mucilage of quince seed or of the pith of sassafras. If this be not attended to, and the pus be suffered to remain confined under the closed and adhering lids, the risk of blindness, from corneal opacity, or a total destruction of the eye will be greatly increased. Bland and tepid fluids should, from time to time, be cautiously injected under the lids, to wash away the purulent secretion; and for this purpose, a weak decoction of poppy heads, or the mucilaginous fluids just mentioned, or tepid milk and water are most suitable. The bowels should be freely moved by small doses of calomel, in union with ipecacuanna, or pulvis antimonialis, with an occasional dose of castor oil. A powder composed of one fourth of a grain of calomel and one grain of the pulvis antimonialis or a half a grain of ipecacuanna may be given four times daily. If these do not keep the bowels sufficiently loose, a teaspoonful of castor oil should be given, once daily, so as to procure four or five evacuations every twenty-four hours. The addition of antimonial powder to the calomel, has appeared to me peculiarly beneficial in such cases. The nausea and vomiting which is apt to follow the use of this mixture appears, frequently to do much good. Indeed the occasional administration of a gentle emetic in the early stage of the complaint, sometimes proves decidedly beneficial. I have, in several instances known immediate and very obvious benefit to result from the operation of an emetic dose of antimonial wine.

If in the course of about thirty-six hours the violence of the inflammation be not moderated, the leeching ought to be repeated. During the active period of the inflammation emolient fomentations, such as warm water, or infusion of white poppy heads, will assist in mitigating the pain, and local irritation: but, with the exception of a very weak solution of sugar of lead, all astringent and stimulating applications are in general highly injurious. As soon as the inflammation has been in some degree moderated, blisters should be laid on the temples, or immediately over the closed eye-lids, and kept discharging by some irritating ointment.

When applied directly over the eyes, they generally produce a more speedy and decided reduction of the inflammation than when laid on the temples. Under the prompt and active employment of these antiphlogistic measures, the pain, irritation, and swelling, usually begin to subside about the third or fourth day, and the discharge becomes gleety, at the same time that the conjunctiva assumes, a paler and flabby appearance. When the inflammation has thus, in part, subsided, recourse must be had to astringent and stimulating collyria. It is of great consequence, however, that remedies of this kind be not applied, until, the inflammation is considerably reduced. The most serious injury may result from exciting applications to the eye, during the active stage of the disease. After the discharge has acquired a gleety character, and the swelling and redness of the lids and conjunctiva are obviously moderated, great benefit may be derived from remedies of this character. A solution of the *chloruret of lime*, in the proportion of about ten grains to an ounce of distilled water, has been found peculiarly useful in the purulent ophthalmia of infants. I have myself employed it, in several cases, with unequivocal benefit. The nitrate of silver also, in the proportion of two grains to the ounce of water, forms an excellent local astringent in this affection. A few drops of this solution should be introduced into the eye, two or three times in the course of twenty-four hours. The best way of doing this is to lay the infant on its back, and pour a small portion of the solution into the inner angle of the eye. By slightly separating the lids the fluid insinuates itself between them and comes in contact with the inflamed conjunctiva. I have frequently injected this solution under the eye-lids with a small syringe, and generally with manifest advantage. When used in this way it must be diluted with an equal quantity of warm water. Dr. Dewees prefers a solution of the sulphate of zinc in rose water (in the proportion of a grain of the former to an ounce of the latter) to all other astringents. I have occasionally employed this article and generally with evident benefit. Its good effects, however, are commonly much less prompt and decided, than those of the nitrate of silver or the chloruret of lime; and in several instances where its use was not attended with any obvious benefit, I have known the nitrate of silver injected in the way just mentioned, to produce

very excellent effects. This writer appears to me to entertain greater apprehensions of injurious consequences from the use of astringent collyria in this affection than is, I think, warranted by experience. During the active and unmitigated progress of the inflammation, all such applications to the diseased conjunctiva are unquestionably decidedly improper; but after the violence of the inflammation has been moderated, and the purulent secretion becomes profuse, thin and greenish, applications of this kind are not only harmless, but in general indispensable to the entire removal of the disease. I have never known any obvious injury to result from the use of nitrate of silver at an advanced stage of the complaint; and I have, in some cases, employed a solution of the strength of four grains to the ounce of water. Travers and several other writers, recommend a solution of alum, of the strength of two grains to an ounce of water.

Should the inflammation, unfortunately, go on to ulceration and sloughing of the cornea, the infant's system ought to be supported by tonics and anodynes. A teaspoonful of a weak infusion of the cinchona bark should be given three or four times daily, with the addition of a drop of laudanum every evening.

Scrophulous, or Exanthematous Ophthalmia.—This variety of ophthalmia generally occurs during childhood, and is frequently the first manifestation of the scrophulous diathesis. It is not, however, always attended with a scrophulous habit; and it may even be doubted whether its connection with the strumous diathesis is sufficiently common, to justify the term "scrophulous," by which it is usually designated. From its frequent association with eruptive affections about the head, the term *exanthematous*, has been given to it by Mr. Wardrop;* and Mr. Christian of Liverpool, has described the same affection under the name of *porriginous* ophthalmia, from its being in many instances preceded by porriginous pustules on the face and scalp.† Mr. Wardrop, however, affirms, that scrophulous inflammation of the eyes, "is a disease quite distinct from exanthematous ophthalmia." I cannot undertake to decide upon this point; but I am very sure, that all the cases of

* Transact. Med. Chir. Society of Edinburg, vol. ii. † Glasgow Med. Jour. No. I.

ophthalmia which I have hitherto met with in children, and regarded as instances of scrophulous inflammation of the eyes, were characterized by the same phenomena that are ascribed to the exanthematous variety of the disease.

This form of ophthalmia is frequently attended with discharging sores behind the ears, and pustular eruptions on the scalp and face. The disease is characterized, by excessive intolerance of light, an enormous secretion of tears, and a muco-purulent secretion from the glands of the tarse, which, during sleep, is apt to agglutinate the eyelids. The pain, except in the commencement, is seldom great, and is attended with the peculiarity, that firm pressure upon the eye, always affords very considerable relief. Nor is the redness of the conjunctiva generally very conspicuous; but in recent and acute cases, an effusion of serum sometimes occurs around the cornea, giving rise to an elevated, œdematous circle, about a line or more in thickness, occupying the margin of the cornea, and presenting a peculiar reddish brown appearance (Jeffreys). Children, who are afflicted with this disease, are so painfully affected by the light, that they are constantly resorting to every mode in their power, for excluding it, as much as possible, from their eyes. The little patient keeps his eyes continually closed, holding the head down, and pressing his hands or a handkerchief firmly upon the eyes; or he rests his head against a chair in some obscure part of the room, or lies with the face buried in a pillow, or in the attendant's lap. "The intolerance of light is always most severe in the morning; and in the afternoon, it sometimes remits so much, as to allow the patient to open his eyes." The tears are not only extremely profuse, but so hot and acrid that they irritate and frequently excoriate the cheeks, alæ of the nose and upper lip. The parts immediately under the eyes, are almost constantly inflamed, and covered with a minute pustular eruption. In the majority of cases, the eyelids become somewhat swollen with turgid veins ramifying on their surface. "On trying to open the lids, a torrent of tears gushes out;" and the patient keeps them so firmly closed, particularly when an effort is made to open them, that it is always extremely difficult to obtain a view of the eye. Neither the kindest language, "nor the severest punishment," will induce the little patient to open his eyes; and such, indeed, is the suffering which

is occasioned by the light, that the utmost effort of the will seems incapable of overcoming the involuntary contraction of the orbicularis of the eyes. In many instances, minute vesicles appear scattered over the cornea and conjunctiva. These vesicles break in violent cases, and form superficial ulcers. If the inflammation be not checked, these ulcerations sometimes gradually penetrate deeper into the substance of the cornea, until they form an opening into the anterior chamber and give exit to the aqueous humor. This unfortunate termination, however, occurs but very seldom, and only in cases of a very acute and violent character. More or less opacity of the cornea, is a very common occurrence; and when the disease becomes chronic, this event is inevitable. In cases of long continuance, tinea ciliaris and lippitudo occur; minute pustular ulcerations appear along the roots of the eyelashes, exuding a muco-purulent fluid, by which the edges of the eyelids are glued together; or the margin of the lids acquire a red and excoriated condition.

In general the pustular eruption about the head, and the discharging sores behind the ears, which precede the occurrence of this variety of ophthalmia, disappear soon after the inflammation of the eyes is fully developed. If these eruptions recur during the progress of the disease, then the inflammation of the eyes generally subsides, and the cornea can be examined. Wardrop asserts, that in exanthematous ophthalmia, no morbid secretion from the meibomian glands ever takes place. This statement is, however, contradicted by other writers; and I am confident, that I have seen several cases, unequivocally of this kind, in which there was manifest disease in the edges of the lids, attended with a glutinous secretion from these minute glands.

Along with these local symptoms, there are always distinct manifestations of constitutional disturbance. The child is generally fretful and irritable; the pulse frequent, quick and sharp; the skin often preternaturally warm and dry; the tongue covered with a thin white fur, and the stomach and bowels in a disordered condition. In many cases the abdomen is tumid and hard, the breath very offensive, and the alvine evacuations irregular and of an unnatural appearance. In cases of long standing, the

flesh wastes,—particularly on the extremities, and the system becomes feeble and very irritable.

This form of ophthalmia is most frequently met with among the poor, of relaxed and irritable habits, "who have a white pasty complexion, with a tense and swollen state of the abdomen, and not unfrequently, enlarged lymphatic glands." It frequently succeeds measles, scarlet fever and other exanthematous diseases; more especially when soon after the subsidence of these affections, the individual has been subjected to the morbific influence of a cold and damp atmosphere. Children who have suffered eruptive affections about the head from difficult dentition, and who are much pampered with improper articles of food, often become affected with this variety of ophthalmia—more especially when the eruptions or discharging sores, have been prematurely dried up, by astringent and stimulating applications. It is probable, that this irritable form of ophthalmia is often excited by the ordinary causes of conjunctival inflammation, such as cold, dust or other common sources of irritation, and that it assumes the aggravated and obstinate character peculiar to this complaint, in consequence of a highly irritable and depraved habit of the system, from the influence of previous diseases or morbific causes.

Treatment.—In the commencement of the treatment of this variety of inflammation of the eyes, the principal attention, is to be directed to the general state of the system. All local applications of a stimulating or astringent character are not only wholly useless, but decidedly improper, until the morbid condition of the system has been improved, by a judicious course of general treatment.

General bloodletting does not appear to exert any obvious influence in subduing scrophulous or exanthematous ophthalmia. In recent and very acute cases, however, some advantage may occasionally be derived, from the application of leeches to the temples and external angles of the eyes; but in instances of chronic character or of long continuance, leeching is not only wholly useless, but often decidedly injurious in its consequences. In the beginning of the treatment, the bowels ought to be thoroughly evacuated, and afterwards kept in a loose state by the regular

administration of suitable laxatives. Free and repeated purging is particularly important, when the abdomen is tumid and hard, and the alvine discharges of an unnatural character. "Even when this ophthalmia appears in a feeble and emaciated child, it will, usually be found, that, by the exhibition of purgatives, feculent matter, both unnatural in quantity and in quality, will be evacuated; and until its evacuation has been completely effected, other remedies will avail but little." Calomel combined with rhubarb, or jalap, should be given every two or three days, in doses sufficiently active, to produce pretty copious purging; or a few grains of colomel may be administered late in the evening, and followed, next morning by a dose of castor oil, or senna infusion. In cases that have assumed a strictly chronic character, repeated *active* purging is not, in general, beneficial. After the bowels have in the first place, been well evacuated, it will be sufficient, in instances of this kind, to keep them *moderately* loose, by small doses of calomel and castor oil. In all instances indeed, particular attention should be paid to the alvine discharges, and in proportion as they are observed to acquire a more natural appearance, the purgatives must be given at longer intervals and in less efficient doses; "for though the greatest benefit will be obtained, by evacuating the bowels, long continued and violent purging will be found equally prejudicial."

In some cases the digestive organs are prominently deranged—the appetite being variable and capricious, sometimes much depressed, and at others quite voracious. When this is the case, *emetics* are capable of procuring very considerable advantage. An aqueous solution of tartar emetic, appears to be the best article for this purpose. The emetic may be repeated every third or fourth day during the active stage of the inflammation. In protracted or chronic cases they rarely prove beneficial.

To promote the regular performance of the various excretory functions, minute portions of calomel and pulvis antimonialis should be given, several times daily; and when the system is very irritable, and the child does not rest well at night, a few grains of Dover's powder may be very advantageously added.*

* ℞. Calomel grs. ii. Pulv. Antimonialis——Doveri——aa vi. Divide into equal parts. Give one every six hours.

After the disordered condition of the alimentary canal has been improved, by the means just mentioned, much benefit may sometimes be derived, "from the carbonates of soda and potass, either singly or combined with rhubarb and the bitter infusions."* The sulphate of quinine, also is a highly valuable remedy in this variety of ophthalmia, after the bowels have been properly evacuated. Dr. Mackenzie of Glasgow, asserts, that he has used it in a great many cases, and that, in the majority of instances its beneficial effects, "were very remarkable." In most of the little patients to whom the quinine was administered, "it acted like a charm." Sir A. Cooper, too, speaks in the most favorable terms, of the employment of this article in scrophulous inflammation of the eyes. I have myself, used it in nine or ten cases of this obstinate complaint, and in every instance with unequivocal benefit. In three of these cases, it effected a speedy and complete removal of the inflammation and morbid sensibility of the eyes. It is proper to observe, however, that its good effects can seldom be obtained at a very early period of the disease, and before the disordered condition of the bowels has been improved by mercurial purgatives, and a mild and digestable diet. The dose for a child of from three to seven years old, should be from a quarter to half a grain three times daily.

Various other internal remedies have been recommended for the cure of this malady—amongst which the *muriate of barytes*, and the *iodine*, appear to be the most important. Hufeland, in a small work on the employment of the former of these articles in scrophula, gives an account of five or six instances of scrophulous inflammation of the eyes, which yielded to the influence of this remedy. I have prescribed it, in several cases of this complaint, with considerable advantage, and it appears to me, worthy of more attention, in this respect, than it has, of late years received. The best mode of exhibiting this article is in solution. A half a drachm of the muriate of barytes, should be dissolved in an ounce of distilled water; of this solution, from ten to twenty drops may be given, to a child between two and seven years of age. The best vehicle for administering it, is sarsaparella syrup,

* Wardrop. loc. citat.

or the compound decoction of this root, as directed in the Dispensatories. The *iodine* has, of late, been strongly recommended as a remedy in this form of ophthalmia; but my own experience has not furnished me with any evidence of its usefulness in this respect. I have prescribed it in four cases of this kind, and although its use was continued for several months, not the slightest benefit resulted from it, in any instance. Nevertheless, no inconsiderable number of cases have been reported, in which this article is said, to have proved decidedly beneficial, and from its well known influence over strumous affections it is, doubtless entitled to attention as a remedy in the present disease.

Astringent and stimulating applications to the eyes seldom afford any permanent relief; and when used at an early period, before the general health has been improved, they may do mischief. As palliatives, however, slightly astringent collyria, such as a weak solution of the sulphate of copper, or of nitrate of silver, may sometimes be used with advantage. When the inflammation and pain are considerable, much relief is usually procured by fomenting the eyes, four or five times daily, with a decoction of white poppy heads, with a small portion of the extract of conium dissolved in it. I have repeatedly employed the nitrate of silver for this purpose, and occasionally with evident advantage. A few drops of a solution, of the strength of two grains to an ounce of water are to be instilled into the eye, once or twice daily. Mr. Mackenzie speaks favorably of a collyrium, composed of one grain of the muriate of mercury to eight ounces of water. After the intolerance of light and excessive secretion of tears has been so far subdued, as to enable the patient to open his eyes in a moderate light, considerable benefit will often result from the introduction of a small piece of red precipitate ointment (15 grains to an ounce of lard) within the eye-lids. At this stage of the disease important relief may often be obtained from slightly scarifying the conjunctiva of the lids. "If," says Mr. Wardrop, "a superficial incision, or rather a very slight scratch be made, with a sharp-edged instrument, or a common wedge-shaped scarificator, across the enlarged and distended vessels of the palpebral conjunctiva, the under eye-lid being previously completely everted and pressed on the edge of the orbit, an astonishing quantity of blood will

sometimes flow, and the relief obtained from this simple operation is often very remarkable. If this operation is followed by considerable alleviation, it may be a few times repeated, until the increased fulness of the vessels and thickening of the eye-lids are removed, and one or two days allowed between each operation. Sometimes, however, the mere abstraction of blood is not sufficient to produce such a beneficial result, and then a small piece of the common ointment of the red oxide of mercury, may be put within the eyelids, immediately after the blood has been drawn."

When the tarsi are much affected, benefit may be obtained from the application of the red-precipitate ointment, of the strength mentioned above, to the edges of the lids. The citrin ointment, will also be found of great use, in such cases. When the disease is so far subdued as to admit of an examination of the cornea, "one or more specks, will generally be discovered, and in many instances distinct ulceration." If small pustules be observed on the cornea, they should not be opened by art, as they are then apt to degenerate into corroding ulcers, an occurrence which always greatly increases the obstinacy of the disease as well as the risk of ultimate loss of sight, from destruction or permanent opacity of the cornea.

Blisters do not often procure any obvious benefit in scrophulous ophthalmia. In cases manifestly attended with a scrophulous habit they may even do harm, by the pustular inflammation which is apt to occur around the blistered part, and the consequent additional source of general and local irritation which is thus produced. When however, the disease succeeds the healing or drying up of discharging sores behind the ears, or scabby eruptions about the head, considerable benefit may be obtained from a succession of small blisters behind the ears. In general, however, the insertion of a *seton* in the back of the neck, is much more efficacious than vesication in this variety of ophthalmia. After the acute character of the disease has subsided, the establishment of such a drain will almost always produce favorable effects. To prevent a relapse—and the tendency to a return of the disease is usually very great—the seton or pea issue is peculiarly valuable.

During the whole course of the treatment particular attention must be paid to the diet and habits of life. In recent and acute

cases of the nourishment should be simple and unirritating, such as liquid and farinaceous preparations or thin animal broths; but in instances of a strictly chronic character, particularly when attended with feebleness and relaxation a more nourishing though plain and digestable diet must be allowed, in order to support the vigor of the system. All stimulating drinks, such as wine, and malt liquors must be carefully avoided. "The body should not be loaded with cloths, and the head particularly ought to be but slightly covered: protecting the eyes with only a single and narrow fold of *black* silk, hanging loosely over them, and not wearing a large bonnet. The hair ought to be cut very short, and the greatest advantage will be found from sponging the head and neck with fresh water every morning—using it at first of an agreeable temperature, and making it colder by degrees, particular care being taken to dry the head well afterwards" (Wardrop). During the declension of the disease, and after it has been subdued, regular exercise in the fresh and salubrious air of the country, sea-bathing, and the tepid shower bath, will contribute very materially to the entire and permanent removal of the complaint.

CHAPTER XXIII.

OF CHOLERA INFANTUM.

The cholera of infants differs in several material points, from the ordinary cholera of adults. It is almost invariably attended with distinct febrile irritation—frequently comes on in a gradual manner,—and is peculiarly liable to become protracted in its duration or to assume a chronic character. In many instances the disease commences with diarrhœa, which after having continued for a few days becomes associated with more or less violent vomiting. In the majority of cases however, the vomiting and purging come on nearly at the same time, without any other premonitory symptoms, than, perhaps, diminished or unusually craving appetite, flatulency and acidity of the primæ viæ, langour, and an uneasy and fretful temper. From the commencement of the disease, whether its accession be sudden or gradual, the pulse is usually frequent, quick, small and somewhat tense. The tongue is generally, at first, covered with a thin white fur; but in the progress of the disease,—particularly when it tends to a chronic form, its surface often acquires a dry, red, smooth or polished appearance. At first the discharges from the bowels usually consist of a turbid frothy fluid, mixed with small portions of green bile, or of a nearly colorless water containing small flocculi of mucus. After the disease is fully developed, the evacuations very rarely exhibit any traces of bilious matter, the biliary secretion being evidently entirely suspended. In some instances the disease commences and proceeds with such violence, as to exhaust the vital powers and terminate in death in the course of a single day. More commonly however, the vomiting and purging are not so rapid as to prostrate the system immediately, and the disease continues for five

or six days, before convalesence begins or fatal exhaustion ensues. In many instances the vomiting, in the course of four or five hours, becomes less and less frequent, and finally ceases altogether, or, recurs only two or three times daily, while the diarrhœa goes on, until, at last it assumes a strictly chronic character. In the early stages of the disease, the little patient is evidently harassed with painful and distressing sensations in the stomach and bowels; and when the discharges are violent and very frequent, the muscles of the abdomen, and even those of the extremities are apt to become affected with spasmodic contractions. If the disease does not terminate fatally, during the first few days, rapid emaciation ensues; the hands and feet become cold and pale, while the head and body are always preternaturally warm; the skin is usually dry and harsh and acquires a peculiar wilted appearance, particularly on the inner part of the thighs, and over the abdomen. The countenance becomes pale and contracted, the eyes, inanimate, and sunk, the nose sharp, and the lips thin, dry, and shrivelled. The thirst is always very great, more especially after the disease has continued for some days, and, no drink is palatable but cold water, which is generally thrown up soon after it is swallowed. Food of every kind is usually loathed and refused. If the disease be not subdued or moderated, by proper remedial means, the little patient, by degrees becomes somnolent, he sleeps with the eyes half open, rolls his head about, when awake, and at last, sinks into a state of insensibility and coma, and dies in a paroxysm of convulsions, or under symptoms resembling those of the last stage of acute hydrocephalus. When the disease is of protracted duration, or assumes a chronic form, the alvine discharges generally acquire a dark, very offensive, and acrid character. The digestive powers become so enfeebled, that almost "every thing taken into the stomach passes through the bowels, in an imperfectly digested state." Aphthæ finally appear on the tongue and inside of the cheeks; the face acquires a bloated or œdematous appearance, the abdomen becomes tumid and tympanitic; the parts about the anus are excoriated by the acrid discharges, and towards the fatal conclusion, spots of effused blood under the cuticle, sometimes appear on various parts of the body—more especially on those upon

which the patient lies. The little patient at last lies in a comatose and insensible state, with the eye lids half open, and the globe of the eye turned up so as completely to hide the cornea. Dr. Dewees states that in many instances as death approaches, "a crystalline eruption" appears on the chest, consisting of an immensity of watery vesicles of a very minute size, which he says, "as far as he has observed," are always indicative of a fatal termination. "This symptom, he says, may readily escape observation if not looked for; it requires that the surface on which it has spread itself, should be placed between the eye and the light, and viewed nearly horizontally." I have, myself, never witnessed this eruption, but I do not doubt the correctness of the Doctor's observations on this point. There is another symptom mentioned by this respectable writer, which I have sometimes noticed in the last stage of this complaint, and which I have also occasionally observed in other forms of chronic disease of the alimentary canal; it is "the thrusting the fingers, nay almost the whole hand into the backpart of the mouth, as if desirous of removing something from the throat." This symptom is no less unfavorable than the preceding one.

The duration of cholera infantum is exceedingly various. It sometimes runs on to a fatal termination in the course of five or six hours. In other cases, the disease continues for many weeks, until the body is reduced to a state of extreme exhaustion and emaciation, and, nevertheless terminates favorably. Death sometimes takes place "most unexpectedly;" and recoveries, now and then occur "in a state of things apparently hopeless." When bilious matter begins to make its appearance in the evacuations and becomes more and more copious, a favorable result may be expected; but when the discharges become watery and nearly colorless, and continue in this state, a fatal termination is inevitable. I have never yet witnessed an instance of recovery from this malady, without the appearance of more or less bile in the alvine evacuations. So long as the liver remains torpid, the morbid irritability and inordinate action of the bowels will continue. A uniform moisture accompanied by a natural temperature of the skin, is a highly favorable symptom; for such is the sympathetic connection subsisting between the liver and the

skin, that the latter scarcely ever resumes its regular functions without a simultaneous recurrence of the biliary secretion. When the pulse becomes feeble and thready, the discharges from the bowels watery and colorless—or reddish like the washings of flesh, or turbid fœtid and mixed with flocculi of mucus, accompanied with great uneasiness, and jactitation, or stupor and partial insensibility; and when in addition to these symptoms the skin becomes cold and clammy, and the countenance pale and cadaverous the worst consequences are to be apprehended.

When death takes place early in violent and rapid cases, the vessels of the liver, stomach, and intestines, are found, on dissection, engorged with blood. The mucous membrane of the bowels, generally exhibits traces of inflammation; and when the disease has continued for a considerable length of time, ulceration and abrasion of this structure, are occasionally met with. In some instances, considerable portions of the intestinal tube are so much contracted as scarcely to admit a small sized quill. The liver, besides the engorged state of its bloodvessels, is often greatly enlarged, particularly in cases of long continuance, and this enlargement is usually attended with a manifest increase of the firmness and denseness of its structure. In the majority of cases the gall bladder contains a pale or almost colorless fluid; but in some instances it is filled with a dark green and viscid bile. The brain in nearly all cases, is in a highly congested condition; and in protracted cases, serous effusions into the ventricles and upon the surface, of this organ are frequently met with.

The *etiology* of the cholera of infants, differs in some important circumstances, from that of the ordinary form of the disease in adults. Both these varieties of cholera, are almost exclusively confined to the hot months of the year; but cholera infantum is vastly more prevalent in large and crowded cities than in the country—a circumstance which does not obtain, in relation to the cholera morbus of adults. During a practice of twelve years in the country, I met with but two or three cases of this disease in infants. Again, the cholera of infants very rarely occurs previous to the third month, or after the twenty fourth month of age,—its occurrence being almost exclusively confined to the

period during which the process of primary dentition is going on. There are therefore three causes whose concomitant influence is intimately concerned in the production of this variety of cholera; namely, high atmospheric temperature, the contaminated air of crowded cities, and the irritation produced by dentition. From the great prevalence of this disease during the hot months of summer, in the more filthy parts of crowded cities, it has been supposed, that it is a *malarious* malady, and "a mere variety of the bilious fever of our climate, the force of which is turned inwards upon the intestines"*. In support of this opinion, it is alleged by the respectable physician just quoted, that though seldom met with in salubrious districts of the country, "a majority of the children fall victims to cholera infantum, in the neighborhood of marshes, or in low, wet and otherwise unhealthy situations." This however is, by no means, confirmed by the observations of those who practice in paludal districts, where miasmata are most abundant. Unquestionably, cholera is more common, both in infants and in adults, in miasmatic localities, than in the high and dry districts of the country; and there can be no doubt, that miasmata have a tendency to favor the occurrence of this disease in infants as well as adults. That *malaria*, however, is not the principal morbific agent concerned in the production of cholera infantum, is evident from the circumstance, that the disease is almost exclusively confined to the first two years of infancy. If this were the chief exciting cause of the malady, it could not be thus limited in the period of its occurrence. It is, moreover, to be observed that this disease usually commences as early as the latter end of May and acquires its most extensive sway in July, some time before the ordinary miasmatic diseases are wont to make their appearance in our climate, except here and there perhaps a few instances. In the eastern cities of this country, particularly in Philadelphia cholera infantum often prevails extensively during the months of June and July, when scarcely any of the diseases justly ascribed to the influence of miasmata are met with.

* Dr. Condie. See his valuable Essay on "Cholera Infantum."—in the Phil'a Jour. of Med. and Phys. Sciences. May. 1825—p. 13.

High atmospheric temperature is manifestly, intimately concerned in the production of this dangerous complaint. It commences with the hot weather, "increases and becomes more fatal with the rise of the thermometer, and declines with the cool weather in autumn. During its continuance, it may be observed to vary with every permanent change of temperature. A few very hot days in succession in the month of June, are sufficient to call it into action; and during the height of its prevalence, a spell of cold weather will diminish, if not suppress it."* But as high and continued heat seldom gives rise to cholera, in infants enjoying the pure air of the country, there must be some other circumstance peculiar to cities which especially favors its tendency to develop the disease. This accessary cause consists, doubtless, in the confined and *impure* air of cities; and hence we always find this complaint most prevalent in the more crowded and filthy districts, and in the narrow and confined alleys, courts and avenues. "Let any one," says Dr. Parrish, "take a walk in a summer morning, through the thickly built lanes and alleys of Philadelphia, he will be struck wtth the appearance of the children, reclining their heads, as if exhausted, upon the breast of their mothers, with a pale and languid countenance, a cool and clammy skin, a shrunk neck, and other signs of debility, arising from their confinement, during the night, to close and hot apartments."

Dentition, also, manifestly contributes, in no small degree, to the occurrence of cholera infantum. Children, who have passed the period of primary dentition, though equally exposed to the heated and impure atmosphere, very rarely become affected with this complaint. It is evident, therefore, that the exciting causes of the disease must be materially influenced by some circumstance peculiar to infancy. It seems to me highly probable, that, in that irritable and enfeebled habit of body, which arises from the continued influence of a heated and impure air, the irritation of dentition is frequently intimately concerned in the production of this malady. In many instances the brain is in an irritated condition, even before the disorder of the stomach and bowels com-

* Dr. I. Parrish. Remarks on the Prophylactic Treatment of Cholera Infantum, &c. North American Med. Jour. vol. ii. p. 68.

mences. Throughout the whole course of the disease, the head is always preternaturally warm, and in most cases, the infant is unusually restless, and fretful, for several days previous to the accession of the disease. The tendency of cerebral irritation to give rise to inordinate irritability of the stomach and bowels is well known. Diarrhœa is a very common, and when moderate, a salutary occurrence during the process of painful dentition. In the commencement of hydrocephalus, much gastric irritability and vomiting are seldom absent. In concussion of the brain vomiting is often a very troublesome symptom; and *sea-sickness*, which is often so violent as to resemble cholera, appears to depend entirely on a peculiar cerebral excitement occasioned by the swinging and rocking motion of a vessel at sea. The great tendency of cholera infantum, in its chronic form, to terminate in a state of cerebral oppression and coma, seems also to show, that the brain is especially predisposed to disease.

We may, therefore, presume, that in the irritable condition of the system, produced by the influence of a very warm and contaminated atmosphere, dentition causes more or less cerebral irritation, which being reflected on the stomach and bowels, renders them preternaturally irritable. If in this state of the alimentary canal, the cutaneous exhalents are over excited and debilitated by high atmospheric temperature, the slightest reduction of temperature, a current of fresh air, or damp night air, will readily cause a sudden torpor of these emunctories. The blood will retreat from the surface to the internal organs, and give rise to engorgement of the vessels of the liver and mucous membrane of the bowels, in consequence of which the irritability of the alimentary canal will be still further increased, and the characteristic symptoms of the disease excited.

There is still another circumstance which must be taken into view, in an account of the exciting causes of cholera infantum—namely, improper nourishment or errors in diet. Irritating, and inappropriate articles of food, are at all times apt to produce disorders of the stomach and bowels, and when the system is predisposed to affections of this kind, by the causes mentioned above, slight errors, in this respect, may give rise to an attack of cholera. A sudden transition from the bland and congenial

nourishment obtained at the mother's breast, to an exclusive artificial diet during hot weather, is often speedily followed by an attack of this dangerous malady.

Treatment.—From what is stated above, in relation to the pathology of this affection, it would appear, that torpor of the hepatic and cutaneous functions, in connexion with cerebral irritation from dentition, exert a powerful influence, in developing and sustaining that irritable condition of the alimentary canal, upon which the characteristic phenomena of the disease depend. No means calculated to allay the excessive action of the stomach and bowels, can be of any permanent avail, if they do not, at the same time, tend to correct the morbid condition of the liver and skin; and hence, opiates and astringents are, not only useless, but almost invariably detrimental, unless accompanied by remedies capable of exciting these functions, and obviating cerebral irritation. In prescribing for this disease, our principal objects, therefore, must be, to restore the regular action of the liver and skin, to obviate irritation and sanguineous congestion in the brain, and to determine the circulation from the engorged vessels of the liver and mucous membrane of the alimentary canal, to the external parts of the body. To answer these purposes, I generally commence the treatment, with the application of leeches to the temples or small blisters behind the ears, the exhibition of small doses of calomel and ipecacuanna, and a large stimulating poultice over the abdomen. I am persuaded, by what I have repeatedly witnessed in my practice, that great benefit will in general result from local depletion, or from the application of blisters behind the ears, or on the back of the neck, in this affection. During the last seven years, I have treated but very few cases in which I did not, at once, apply blisters behind the ears; and I may confidently affirm, that since I have adopted this practice, I have been much more successful in the management of this disease, than previously. Dr. Parrish was, I believe, the first who pointed out the usefulness of blisters about the head in the cholera of infants. "In severe cases," he says "much good may be expected from the application of blisters behind the ears. I was led to this practice, by observing that

the eruption, which, during dentition, is apt to make its appearance behind the ears, often proves a most salutary effort of nature; and that while it continues, the infant generally enjoys an exemption from those dangerous disorders incident to this critical period of life. To imitate nature as closely as possible, the discharge from the blistered surface should be maintained for some time, by stimulating dressings. I have witnessed the most beneficial effects from this practice and can strongly recommend it to the attention of the profession."* The gums should always be carefully examined in cases of this complaint. If they are in a swollen or inflamed and painful state, they should be freely divided, down to the advancing teeth. For the purpose of moderating the gastro-intestinal irritability and of stimulating the action of the liver, minute portions of calomel and ipecacuanna constitute, I think, the most efficient internal remedy we possess. From one sixth to a quarter of a grain of calomel in union with a quarter of a grain of ipecacuanna should be given every half hour, or hour, until the evacuations become mixed with bilious matter. The appearance of bile in the evacuations, is always to be hailed, as a very favorable sign; and the sooner the liver can be brought to resume its secretory action, the greater, in general will be the probability of ultimate success in our attempts to subdue the disease. Indeed so long as the liver remains inactive and the alvine discharges free from bile, the disease may be regarded as still possessing all its violence and dangerous tendency, whatever temporary abatement may occur in the severity of the vomiting and purging. Ipecacuanna, in minute doses is a most excellent auxiliary to the calomel, in affections attended with morbid irritability and excessive peristaltic action of the alimentary canal. Its tendency to counteract inordinate action of the bowels, when given in very small portions is very considerable, and its tendency, moreover, to excite diaphoresis, renders it still more applicable in this and other intestinal affections of this kind. When the vomiting and purging are extremely frequent, other means calculated to calm the irritability of the stomach and bowels may be advantageously used along with the

* loco citat.

calomel and ipecacuanna. The spirits of turpentine is an excellent remedy for this purpose. Dr. Condie, states that in his practice, the administration of from ten to thirty drops of this remedy, three or four times daily, "has not in a single instance failed in speedily checking the disordered action of the stomach." I have used this article in a considerable number of cases, and in most instances, with decided benefit. I prefer, however, giving it in much smaller and more frequent doses—namely, from four to six drops every hour until the violence of the vomiting has been moderated. I have also, occasionally, used a solution of camphor in sulphuric ether, (a drachm of the former to an ounce of the latter) with very obvious advantage. Five or six drops of this solution given every half hour or hour, seldom fails to moderate the excessive vomiting in this complaint. A large stimulating poultice, applied over the abdomen, is, generally, of material service in allaying the inordinate action of the stomach and intestines. Two or three tablespoonfuls of powdered black pepper, with a few teaspoonsful of cayenne, mixed up with a common emolient poultice will answer very well for this purpose. The application of a piece of flannel moistened with a mixture of equal parts of spirits of camphor and tincture of capsicum, often produces a very good effect. Blistering, however, is, I think decidedly the most efficient counter-irritating application. Before the blister is applied to the epigastrium, the part should be slightly bathed with spirits of turpentine, in order, to procure vesication as speedily as possible. The vesicatory should not be suffered to remain on the skin more than four hours. As soon as the surface is uniformly inflamed, which in children usually occurs in about four hours, and sometimes much sooner, the plaster ought to be removed, and a thick, and soft emolient poultice laid over the whole abdomen, including of course the inflamed surface. The poultice will, in a short time, excite the inflamed vessels to pour out a copious quantity of serum, under the cuticle, and raise a large blister, which should then be opened, and dressed with mercurial ointment prepared without turpentine or other irritating substances.

When from the tumid and tense state of the abdomen, there is reason to presume that the bowels are loaded with fæcal matter,

the first few doses of calomel should be sufficiently large to procure its purgative operation. A grain or two may be given every two or three hours, until its evacuant effects are decidedly procured. After the fæculent contents of the bowels have been well evacuated, in this way, it will, I think, in general, be best to return to the minute and frequent doses of this article mentioned above. Except under the circumstances just mentioned—namely, a loaded state of the bowels, purgatives are not, in general, advisable in the commencement of the disease. When the disease continues, however, until the liver, under the exciting influence of the calomel, pours out an abundance of bile, mild laxatives are undoubtedly very useful. In cases that come on gradually and proceed slowly, it may perhaps be better to commence at once with purgative doses of calomel, than with the minute portions mentioned above. In instances of this kind, the bowels are frequently much loaded with fœcal matter and vitiated secretions, which it is of much consequence to evacuate, as speedily and completely as can be done, without resorting to very active or irritating purgatives. When there is reason to suspect the existence of acid in the stomach and intestines, much benefit may be derived from the administration of five or six grains of prepared chalk, with each dose of calomel and ipecacuanna; or what is, perhaps, preferable, from the use of small portions of magnesia in combination with ammonia, as recommended by Dr. Kuhn.* I have in some instances of this kind, administered six or eight grains of calcined magnesia, in union with five or six drops of the abovementioned etherial solution of camphor, with the happiest effect. Indeed, this combination is not only peculiarly effectual in cases attended with acidity in the primæ viæ, but is also a highly valuable remedy, for allaying gastric irritability, or excessive vomiting, even where there is a total freedom from acid.

When the abdomen is tumid, tense and tender to the touch, whilst the pulse is frequent, contracted and quick, blood ought to

* "The prescription made use of by Dr. Kuhn," says Dr. Condie, "was the following: ℞ Magnes. calcinat. ℈iv; pul. g. arab.. ℈i: sacch. alb. ʒii; aq. menth. pep. ℥ss; aq. fontanæ ℥iiss; M.: add aq. ammonia pura, gtt. xlviii to clxiv, according to the age of the patient. The dose of this mixture is a teaspoonful every two hours. *Vide Dr. Condie's Essay. Loct. Citat.*

be abstracted either with the lancet, or by the application of leeches to the epigastrium. If blood be not promptly and efficiently abstracted, in cases attended with these symptoms, it will be "in vain to depend upon the effects of any remedy; for inflammation and its consequences will have ensued, long before we can hope to make any impressions on the affected viscera, even by the use of calomel." After blood has been abstracted, in cases of this kind, a blister ought to be applied over the upper portion of the abdomen. In all instances indeed, whether attended with symptoms of abdominal inflammation or not, blistering the region of the stomach, is a most useful mode of making counter irritation.

The warm bath, also, is an excellent auxiliary in the treatment of this disease. It is especially indicated, when the skin is very dry and harsh, and the pulse quick and irritated. While the patient is immersed in the warm water up to the neck, a napkin wet with cold water, should be applied to the head, in order to lessen the determination of blood to the brain.

In the early stage of cholera infantum, the use of opium is, in general, highly improper. The great tendency to congestion and irritation of the brain, in this affection, renders all medicines of this kind decidedly prejudicial when given at an early period of the disease, or where, in its advanced stage, symptoms of cerebral oppression are manifestly present. Nevertheless, when in the *chronic* form of the disease, the patient is very restless and wakeful, with a dry and withered state of the skin, and there are no particular indications of cerebral congestion, small doses of Dover's powder, in union with minute portions of calomel, will sometimes produce very excellent effects. Great caution, however, ought to be used, in the administration of opium, even in cases of a strictly chronic character. I have witnessed some instances of this kind, in which the employment of this narcotic was speedily followed by stupor or cerebral compression without any obvious beneficial effect on the intestinal disorder.

Astringent and absorbent remedies are in general decidedly improper, in the early stage of the complaint. Much mischief has been done by the early administration of cretacious juleps, astringent mixtures, aromatic draughts and opiates in this malady. After the fæculent contents of the bowels have been well evacu-

ated, and the secretory action of the liver has been excited by calomel, and in cases that have assumed a chronic character, the milder or less stimulating astringents, will, under judicious management, often procure very considerable benefit. I have, in some instances, derived very obvious advantage from a decoction of the root of the geranium maculatum in milk, in the advanced stages of the complaint. The *acetate of lead* has been very favorbly mentioned, as a remedy in this affection. As early as 1805 Dr. Mann of Massachusetts, recommended this article, as capable of procuring "considerable benefit in this disease."* Dr. Irwin of Charleston, South Carolina, also speaks strongly in favor of the employment of this remedy in the cholera of infants; and we have moreover, the authority of Dr. Chapman, in behalf of its usefulness in this dangerous affection. I have employed this article in four or five instances, with a result sufficiently favorable, to induce me to believe, that considerable benefit may be derived from its use, provided the action of the liver has been excited by the previous employment of mercurials. So long, however, as the evacuations indicate the existence of functional torpor of the biliary organs, and there is reason to believe that the intestines are charged with fæculent matter, it will, I am persuaded, be most prudent to abstain from this, and all other astringent substances. After the bowels have been thoroughly evacuated by calomel, and the alvine discharges assume a bilious appearance, and in cacases of a chronic character, small doses of the acetate of lead, may be used with a favorable prospect of advantage. The fourth of a grain of this article with an equal quantity of Dover's powder should be given every two or three hours, and continued until the inordinate diarrhœal action of the bowels is checked. In the advanced periods of the disease, I have occasionally procured considerable benefit, from a solution of the tartrate of iron. Forty grains of this preparation, may be dissolved in two ounces of water, to which half an ounce of ginger syrup should be added. Of this from twenty to forty drops may be given to an infant four or five times daily. Dr. Robert Jackson speaks very favorably of the use of finely powdered charcoal, in diseases of the intestinal canal at-

* A Dissertation upon Cholera Infantum, &c. By James Mann, M. D. Vide a Review in New-York Med. Repository, vol. ii. p. 309—for 1805.

tended with morbid secretions; and Dr. Condie, states, that he has used this article with much advantage, "in the latter stage of the disease, when it had become, in some degree, chronic, and the discharges, from the bowels were acrid, dark colored and offensive." From my own experience, I can say nothing of this remedy, but I do not doubt its occasional usefulness, under the circumstances just mentioned. From five to ten grains of the pulverized coal, in union with four or five grains of rhubarb and a grain of ipecacuanna may be given every three or four hours.

When from the violence and rapidity of the disease, or from its long continuance, the exhaustion becomes very great, the extremities cold, and the pulse very small and feeble, internal as well as external stimulants become necessary. Stimulating frictions, wrapping the body in flannel wrung out of hot brandy and water, together with the use of wine-whey, milk punch, or a weak solution of carbonate of ammonia, with an equal portion of the compound tincture of cinchona, are indispensable to support the sinking energies of the system. I have known, much benefit to result from the use of the *tincture of cinnamon.* From fifteen to twenty drops should be administered in some mucilaginous fluid every four hours.

In the advanced periods of the complaint, severe colic pains, from flatulent distention of the stomach and bowels frequently greatly harass the little patient. To relieve these pains, Dr. Condie strongly recommends a few drops of the spirits of turpentine; and my own experience enables me to speak favorably of this remedy. The juniper oil, also, is an excellent palliative, for this purpose. When given with sulphuric ether and laudanum, it seldom fails to procure, very considerable relief. From ten to fifteen drops of the following solution, may be given three or four times daily.*

After the disease has been, in a considerable degree subdued, and the alvine discharges, have assumed a natural appearance, recourse should next be had, to remedies calculated to invigorate the stomach and intestines. A decoction of blackberry root in milk, in the proportion of half an ounce of the root to a pint of

* ℞. Ol juniper, ʒii. Sulph.Æther, ℥ss. Tinct. Opii. gtt. lx. M. ft.

milk, often proves very useful at this advanced and declining stage of the disease. The common cretacious mixture, with the addition of a small portion of the tincture of kino, forms also, a very useful remedy for this purpose. But the remedy I have found most beneficial, in restoring the tone of the alimentary canal, is a mixture of equal parts of lime water, and infusion of peruvian bark, with four or five drops of the tincture of kino, with each dose. The dose for an infant, is a dessert spoonful four or five times daily, mixed with a little barley water or solution of gum arabic.

Throughout the whole course of the disease, particular attention must be paid to the proper regulation of the diet. If the child is nourished at the breast, and the mother or nurse furnishes a sufficient supply of wholesome milk, no other nourishment whatever, should be allowed. If it has been weaned, great care must be taken that the food be of the simplest and blandest kinds possible. Boiled milk; liquid preparations of arrow-root, tapioca, sago, rice; thin oat meal gruel, barley water, or a solution of gum arabic, are decidedly the most suitable articles of nourishment in every stage of cholera. In the *chronic* form of the disease, however, beef tea, or weak chicken broth, either by itself or mixed with some of the preceding articles, sometimes produces a favorable change in the state of the stomach and bowels. In cases of this kind, the little patient sometimes manifests a most urgent craving, for certain strong and stimulating articles of food, such as salted and smoked herring or shad, old and rancid bacon, salted beef, &c. whilst the stomach appears to loathe all the light and unirritating articles of nourishment, enumerated above. When this occurs, it will be proper too, cautiously to gratify the newly-awakened appetite, however, opposed to the ordinary dietetic rules the indulgence may appear to be. "I have seen many children recover," says Dr. Rush, "from being gratified in an inclination to eat salted fish, and the different kinds of salted meat. In some instances, they evince an appetite for butter, and the richest gravies of roasted meat, and eat them with obvious relief to all their symptoms." Without these strong instinctive calls of nature, however, it would be highly improper to allow such coarse articles of food—yet where

the inclination for them, is distinctly manifested, it ought to be gratified, though always in a cautious manner.

Nothing contributes more to the removal of this disease—more especially when it tends to a chronic form, than the enjoyment of the pure and salubrious air of the country. Whenever it is practicable the little patient ought to be removed into the country; for this change is often sufficient to subdue the disease in a short time, without the aid of any other remedial means. If the circumstances do not admit of a removal from home to a suitable situation in the country, some advantage may be gained by carrying the patient about in the open and fresh air; and still more by frequent rides into the country in a carriage.

As a preventive measure, residence, or at least daily gestation, in the pure air of the country has a most salutary influence. If this advantage cannot be procured, every other practicable means should be adopted, to protect the infant against the relaxing and enervating effects of a heated and confined air. The practice of keeping the windows and doors closed, at night, and placing the infant upon a soft feather bed, with an abundance of covering, during the warm months of summer, has a most pernicious effect. "Examine," says Dr. Parrish, "in the morning, a child who has passed the night thus confined. You will find him limber as a rag, exhausted by perspiration, wholly destitute of animation, without appetite, and on the very verge of cholera." To avoid these injurious effects, the doors of the infant's sleeping apartment should be open, and, if the room is large enough to prevent the current of night air, from passing immediately over the child, the windows, also, should be kept open, with the shutters closed. The child should sleep on a mattress, "or on blankets folded and laid upon the floor; and the covering ought to be light but comfortable." The use of the tepid bath, or frequent ablutions with cool water will assist materially in fortifying the infant's system, and lessening the liability to an attack of this disease. The respectable physician, whom I have just quoted, strongly recommends, allowing infants the free use of cool and fresh water, as a beverage during the heat of summer, as a prophylactic against this and other maladies; and I have not the slightest doubt of the entire propriety of this advice. The child should be daily carried out, into the

open air, and, if practicable, beyond the bounds of the city. All strong, flatulent, and indigestible articles of nourishment, should be carefully avoided. During the first year no nourishment is so congenial and appropriate as the mother's milk. Nourishment at the breast is particularly important during the active progress of dentition. If the child has been weaned, milk, preparations of arrow-root, tapioca, and sago—oat meal gruel, weak chicken broth, and beef-tea, constitute suitable articles of nourishment. Experience has shewn, that "the sucking of small pieces of salt meat—as ham, or dried beef," is often productive of manifest advantage. If the gums become inflamed and swollen they should be freely divided, down to the advancing teeth. Dr. Parrish speaks very favorably of the habitual use of aromatics, during the summer, as a means of guarding against the occurrence of this malady. He does not, however, advise, that they should be given, "indiscriminately to all children, during the summer." They are proper only in those cases, "in which a predisposition to cholera infantum exists." The daily use of moderate portions of ginger tea, or of a weak infusion of cinnamon, or of nutmeg, produces an excellent effect, in giving tone to the alimentary canal, and fortifying it against the influence of the usual exciting causes of this malady. I can say nothing from my own experience of the effects of this practice; but it seems very probable that, where there is general languor, with a weak and inactive state of the digestive organs, considerable benefit may be derived from the judicious employment of the milder and more agreeable articles of this class of stimulants, The use of small portions of porter and water, has appeared to me very beneficial in feeble and relaxed infants, during the warm seasons, as preventive of bowel complaints. It is to be observed, however, that when the system is under the influence of painful dentition, where the pulse is contracted and irritated, and the head very hot, particularly when attended with great irritability and fretfulness of temper, all articles of this kind are decidedly objectionable. It is only in cases of weakness and languor, accompanied with a feeble and relaxed state of the alimentary canal, and a sluggish state of the circulation, that they can be employed with propriety and advantage.

CHAPTER XXIV.

OF THE REMITTENT FEVERS OF INFANTS.

Children are subject to various modifications of remitting fever, which, in their phenomena, progress and causes, differ very materially from the ordinary remittent fever of adults. Authors have described this fever, under the titles of worm fever, the hectic of dentition, hectic of infants, and marasmus. Underwood gives a short description of four "kinds" of fever, peculiar to infancy and childhood, all of which are treated of by Butler, Pemperton, Colley and others, under the general head of *infantile remittent*. Burns divides the remittents of children into two varieties—namely, that which occurs "in early infancy," and that which takes place after the process of primary dentition is completed. This division is judicious and useful; for the cases that occur during dentition are usually characterized by some peculiar phenomena, and require corresponding modifications in the remedial treatment.

I. *Of the remittent fever of infants during dentition.*—This modification of infantile remittent, generally bears a close resemblance to the forming or initial stage of acute hydrocephalus, and indeed, there is not much difference between them; "for in both we have much cerebral irritation, and the difference is more in the result than in the early condition."

The first manifestations of indisposition, generally, occur during the night. The infant is, unusually restless, and starts frequently in its sleep, as if from sudden fright, or it remains awake and extremely fretful during the greater part of the night. Its skin is hot and dry, until towards morning, when a slight moisture breaks out about the head and chest. In the early part of the forenoon, the countenance is pale with an expression of suffering and discontent, and the little patient ceases to evince its usual playful-

ness and interest in its toys. The pulse is always very frequent, and generally contracted and firm. In the afternoon the irritability and fretfulness of temper increase, a circumscribed blush commonly occurs on one or both cheeks, the child is inclined to vomit, the frequency and tension of the pulse increase, the skin becomes hot, the urine is scanty and high colored, and in some instances so acrid, as to cause the infant to cry out with pain during micturition. A slight cough, with augmented secretion of bronchial mucus, generally supervenes after the disease has continued for some days, and the bowels are irregular, mostly costive, while the alvine evacuations are extremely offensive, and of a muddy-brown or bright-green and curdled appearance. If the disease be not counteracted by suitable remedies, the febrile symptoms gradually increase. The exacerbations become more violent and protracted—during which the infant generally lies in a somnolent or drowsy state, with the eyes half open and turned upwards so as to conceal the cornea. If the disease continues, the remissions become shorter and less distinct, and the symptoms of cerebral irritation more and more conspicuous—the eyes acquiring a dull, heavy and slightly injected appearance, and the countenance an expression of surprise or stupor. By degrees symptoms of cerebral oppression or effusion ensue, and the child dies in a state of coma or a paroxysm of convulsions. In some instances, however, instead of these hydrocephalic symptoms, the little patient is gradually exhausted, "by the continuance of the fever, or, more quickly, by the accession of rapid and obstinate diarrhœa.

If the disease is suffered to run on for six or seven days, it seldom terminates favorably before the end of the second week; and in some instances, after the violence of the disease has been subdued, a slow irritative fever continues for many weeks, or until the advancing teeth are completely protruded. In these protracted cases, the infant is pale, languid, extremely fretful and restless, with irregular bowels, and a frequent and very small pulse. The head is, usually, very warm, while the hands and feet are often cold; and in some instances, the face acquires a bloated or tumid appearance. Not unfrequently, however, the disease begins to subside as early as the fourth or fifth day. The

exacerbations become shorter and less severe; the child rests better at night, and the skin becomes cooler and more uniformly moist and soft. The declension of the disease is often attended with moderate diarrhœa, or a profuse secretion of saliva, and "we sometimes find that, at this time, one or more teeth have made their appearance."

This modification of infantile remittent fever, appears to be an irritative fever depending on difficult dentition, modified and aggravated by gastro-intestinal irritation or a disordered condition of the chylopoictic organs. Throughout the whole course of the disease, distinct manifestations of cerebral irritation are present, and in many instances, the brain is obviously in a state of erethism for many days, before the disease assumes a decidedly febrile character. The disease very rarely, if ever, occurs, when the advance of the teeth through the gums is attended with a profuse secretion of saliva or a moderate diarrhœa. Costiveness and a dry and unusually warm condition of the mouth, are among the most constant symptoms of the early stage of this disease; and in most instances there are very obvious indications of irritation in the gums.

Treatment.—The mouth should always be carefully inspected, and if the gums are in the slightest degree swollen or inflamed, they should be freely divided. The irritated and irritating contents of the bowels must be evacuated, and remedies prescribed for correcting the biliary and intestinal secretions. For this purpose, one or two grains of calomel should be administered, so as to procure free purging. If the calomel is slow in operating, or inefficient, it should be followed, in three or four hours by one or two teaspoonfuls of castor oil or of the syrup of rhubarb. After the intestines have been, thus, well evacuated, they must be kept in a loose state by the regular administration of very small doses of calomel in union with ipecacuanna. The fourth of a grain of the former with half a grain of the latter, may be given four times daily, and if these do not keep the bowels sufficiently open, their aperient operation ought to be promoted, by a suitable portion of magnesia, castor oil, or rhubarb, once every twenty-four hours. If the child is robust and plethoric much

advantage may be derived from the abstraction of an ounce or two of blood, either with the lancet, or by leeching about the head; and when the pulse continues to be active and tense, and there are decided indications of cerebral irritation, the bleeding ought to be repeated until an evident impression is made on the action of the heart and arteries. After the violence of the reaction has been, in some degree, moderated, by evacuants, a blister should be applied to the back of the neck. When the head is very hot and a tendency to stupor occurs, cold applications to the head are very useful; and, if at the same time the hands and feet are cold, sinapisms or vesicatories may be advantageously applied, to the wrists and soles of the feet, or above the ankles. Some benefit may also be obtained from the use of diaphoretic remedies. The following mixtures are well adapted for this purpose.* When the stomach is not too irritable, tart. emetic, in minute doses, is calculated to operate very beneficially in cases of this kind. When there is much cerebral irritation with an active and firm pulse, this article may, in general be given in pretty active doses, without exciting much vomiting. I have often given the eighth of a grain, every two or three hours, to infants laboring under this complaint, with but little or no vomiting, and generally, with a decided sedative impression on the action of the heart and arteries. The effects of opium in this complaint are very uncertain. In some instances, it operates very injuriously,—increasing the determination of blood to the brain, and hastening the supervention of cerebral inflammation and oppression. In other cases, its effects are highly beneficial. It moderates the general irritative condition of the patient, lessens the frequency and tension of the pulse, and removes all the alarming symptoms of approaching inflammation and effusion within the head. It is, indeed, often extremely difficult, to determine satisfactorily, merely from the symptoms, whether this narcotic be proper or not. When the symptoms indicate a strong tendency to, or the actual presence of inflammation of the brain,—

* ℞. Pulv. Extract Glycyrrh. ʒii; Pulv. Nitrat Potass ℈i; Aq. fontanæ ℥ii; Vin. Antimon. gtt. xl; M. Dose, a teaspoonful every two or three hours.

* ℞. Spirit Minderiri, ℥ii; Syrup Limonis ℥i; Vin. Antimonii gtt. 40: Spirit Nitri. Dulc. ʒiss. M. ft. Dose, a teaspoonful every three hours.

that is, when the child rolls its head about on the pillow, keeps its hands pressed on the forehead, shuns the light, starts and screams out suddenly, has a discontented and frowning expression of the countenance and is withal of a robust and plethoric habit, the use of opium, will probably result in serious injury to the patient. When, on the other hand, the general habit is feeble, or free evacuations have been premised, and the little patient is restless, irritable and fretful, with a pale and languid countenance, we may, with but little risk of injury resort to this remedy; and its effects in cases of this kind, are often highly favorable. Even in cases, however, where there was much reason to apprehend the existence or near approach of cerebral inflammation, I have known the most decided benefit to result from the regular exhibition of small doses of Dover's powders in union with calomel. Free purging, should always be premised; and when the pulse is active and tense, as it almost always is, blood ought to be efficiently abstracted, before opiates are resorted to.

The best form, perhaps for administering opium in this disease, is in combination with calomel and pulvis antimonialis. The twentieth of a grain of this narcotic, with a fourth of a grain of calomel and half a grain of antimonial powder, may be given every three or four hours. Burns recommends the use of a few drops of the tincture of hyoscyamus, with a saline julep, to moderate the general irritation. I have used the tincture of belladonna for this purpose with evident benefit. Three or four drops given, twice or thrice daily, frequently produces an obvious abatement of the irritability and restlessness of the little patient. The daily employment of the tepid bath, is calculated to do considerable good, in moderate cases of the complaint by relaxing the skin, and allaying irritation. It should be used during the febrile exacerbation, and the child must not be suffered to remain in the bath longer than about ten minutes. This remedy is particularly useful in cases, depending, mainly, on difficult dentition. It seldom fails to tranquillize the system, when used in instances of this kind.

If, after the acute spmptoms have gone off, the disease continues in a chronic form, the child being pale, languid, emaciated, fretful,

and restless during the night, with a small and thready pulse, and a disordered state of the bowels, gestation in the open air of the country, often proves highly beneficial. In this stage of the disease, I have derived very considerable advantage, from the use of Dr. W. Fordyce's *pulvis antihecticus infantum*—consisting of from ten to twenty grains of the sulphate of potash, in union with from five to eight grains of powdered rhubarb, according to the age of the child. Such a portion should be given every morning, until the alvine evacuations assume a more natural appearance, and the action of the bowels become regular. A few grains of Dover powder, with the fourth of a grain of calomel should be given every evening. In cases of this kind, the tincture of hyoscyamus and belladonna are, in general peculiarly beneficial. Three drops, in a teaspoonful of spirit Minderiri sweetened with lemon or ginger syrup, should be given three or four times daily.

The infant's diet must be carefully regulated throughout the whole course of the disease. Animal food of every kind is decidedly objectionable. If the child is still nourished at the breast, and the mother or nurse furnish a sufficient supply of good milk, no other nourishment is necessary. If there is a deficiency of milk, or if the child has been weaned, it should be confined to the use of thin preparations of arrow-root, sago, and oat-meal, and a mixture of three parts of cow's milk and one of water. During convalescence, or in a low and chronic state of the disease, weak beef or chicken tea may be allowed, along with the farinacious preparations just mentioned. Equal parts of thin arrow-root and chicken tea forms a good nourishment in this condition of the patient.

II. *Of the remittent fever of children after dentition.*—This modification of remitting fever, very rarely occurs previous to the second year, and is evidently intimately associated with derangement of the chylopoictic system, or gastro-intestinal irritation. In some instances the disease comes on suddenly, in consequence of overloading the stomach, or of the use of irritating and indigestible articles of nourishment. The attack generally occurs at night. The child becomes pale and cold or is seized with chilliness, which, in most cases, is soon followed by nausea and vomit-

ing. Febrile reaction speedily ensues; the skin becomes extremely warm and dry, the pulse very frequent and strong, and the little patient is very restless, thirsty, and usually complains of headache, and severe transient pains in the stomach. Towards morning, a slight perspiration breaks out about the head and chest, and the febrile symptoms remit, leaving the child pale and languid, without the least appetite for food. In the course of the morning generally about ten or eleven o'clock, the child's countenance becomes contracted and very pale, its hands and feet are cold, nausea, and generally vomiting occur, and a second febrile exacerbation ensues, which usually continues until the following morning, when a remission takes place, which, if the disease is not arrested, is again succeeded by a paroxysm of fever. During the first ten or twelve hours, the tongue is generally clean; but in the course of the second day, it becomes covered with a white fur, which soon acquires a brown appearance, and in protracted cases, at last becomes almost black. The bowels are generally extremely torpid, the pulse though frequent, full and quick, is seldom firm or tense; the thirst is always very great, and the child complains of almost constant headache. During the first two or three days, nausea and vomiting occur repeatedly, and the child, usually, feels somewhat relieved, particularly of the headache, after each spell of vomiting. After the disease has continued for some days, the little patient is apt to remain in a drowsy state during the febrile exacerbations, and is apt to pick the lips and nose with his fingers, until they become quite sore.

Cases of this kind, if not subdued, at an early period, often continue for several weeks. The abdomen, at last, becomes tumid and distended with wind, or tympanitic; a black sordes collects about the lips and teeth; if a purgative is given, a reddish, or muddy water passes off, mixed with small masses of solid feculent matter and small flakes of mucus, or the discharges are black and glairy, or green and curdled.

Much more frequently, however, this variety of fever comes on in a gradual manner. The child begins to droop; its countenance is pale, with an expression of languor and uneasiness, the pulse frequent and small, the hands and feet cool and the head

and body generally unusually warm. In the afternoon—slight febrile symptoms occur, and in many instances, several attacks of feverishness take place in the course of the day, during which, the child, generally lies down, and falls into a heavy and disturbed sleep. In the intervals of these slight febrile exacerbations, the little patient appears to be "tolerably well, but is easily put out of temper," and seems to feel a general soreness of the flesh, causing him to fret and cry out as if in pain when touched or lifted. The tongue is covered with a thin white fur, the thirst is moderate, and the appetite, in general, depressed and capricious. The bowels are usually torpid, though in some cases, the stools are frequent, liquid and very offensive. The evacuations are seldom very bilious, and in many instances, there is a manifest deficiency of bile. These symptoms, generally, continue for eight or ten days, when all at once, a severe paroxysm of fever, occurs, preceded by chilliness or shivering attended commonly with nausea and vomiting. The pulse becomes very frequent, full, and somewhat tense, the countenance flushed, and the drowsiness is much increased. The patient seldom complains of pain in any part, except occasionally, of transient and sometimes very severe pains in the abdomen. If, however, pain does occur in the head, which is by no means common, it is usually "both violent and permanent." One of the most constant symptoms attending the fully developed state of this fever, is, an incessant picking of the lips, nose, and angles of the eyes. When the disease has advanced to this stage, there is an entire loathing of every kind of food; digestion appears to be wholly suspended, and the tongue becomes covered with a thick fur, which soon acquires a dark brown color. The intestines are, almost invariably, exceedingly torpid, and the alvine evacuations are "without the smallest resemblance either in appearance or smell, to those fæces, where the power of digestion has been exerted." They are dark or black and glairy, or thin and foamy, resembling yeast, or curdled and dark green, with a very peculiar offensive smell; and in some instances, they are whitish or clay-colored, "indicating a deficiency of bile." (Burns.) As the disease advances, delirium occurs during the exacerbations, and in the last stage, it sometimes continues for two or three

days, with but slight and temporary abatements in the morning In general, however, the patient may be roused from the delirium for a minute or two, so as to answer questions distinctly. At first the febrile exacerbations occur only in the afternoon; but by degrees, they become prolonged, so as to leave but very short and imperfect remissions between them. During the delirium, the child picks at the bed-clothes, is very restless, starts up suddenly, and moans and sighs almost constantly; and in severe cases it has fits of violent screaming and agitation. Towards the fatal termination of the disease, convulsions, paralysis of one side, strabismus, or deep coma sometimes occurs. The abdomen, generally, becomes tumid and tense or tympanitic, in the advanced stages of the disease, and, in some instances a total retention of the urine takes place.

After this fever is once fully developed, it seldom terminates before the seventh or eighth day, and, most frequently, continues for several weeks. When paralysis, strabismus, or convulsions occur, there can be but very slight hopes of a favorable termination. These symptoms are, however, not always indicative of a fatal result, for patients sometimes recover, after all the usual signs of cerebral effusion have supervened. Nevertheless, when symptoms of this kind are attended with a bloated and tense state of the abdomen, and watery discharges from the bowels, all hopes of a fortunate termination are in vain.

In some cases, this fever never becomes very violent, but creeps on in a slow or chronic form for three or four weeks. In instances of this kind, there is always a considerable remission in the morning, even in the advanced stages of the complaint, and the exacerbations are scarcely ever attended with delirium or very great drowsiness. At first the appetite is depressed, but in the course of four or five days, it generally improves, and the child will eat, pretty freely, during the remissions. The alvine evacuations, however, exhibit a very unnatural appearance, and are extremely offensive. The intestines become greatly distended with wind so as to give a tumid and drum-like elasticity to the abdomen. Evacuation goes on rapidly, and the countenance acquires a very pale and haggard appearance. The brain, at last, sometimes becomes affected; the child becomes more and

more fretful during the remissions and drowsy in the exacerbations. It starts and screams out in its sleep, grinds its teeth, turns the eyes up so as to hide the cornea, and finally sinks into a state of constant somnolency, coma, attended, perhaps, with paralysis and convulsions.

Dr. Underwood mentions a modification of this fever, the most remarkable symptom of which, he says, is the occurrence of "inflamed and sometimes painful tumours," seated chiefly on the inferior extremities, more especially along the spine of the tibiæ. They acquire the size of a nutmeg, in the course of the second day, and soon become soft, resembling small abscesses. They do not, however, suppurate, or contain matter, and generally disappear again, in four or five days. I have met with a few instances of this kind, and have not found them to be attended with any peculiar difficulty or obstinacy.

It is often extremely difficult to distinguish infantile remittent fever from acute hydrocephalus, and in some cases, indeed, there exists no essential difference between them—the causes and prominent pathological conditions being in every important respect of the same nature. In many instances, however, infantile remittent fever, though similar in appearance, with hydrocephalus, is nevertheless, sufficiently distinct from it, to render a correct diagnosis between them of considerable consequence, both in a prognostic and remedial point of view. The following circumstances, will in general enable us to distinguish the two complaints from each other. In hydrocephalus, the face is frequently flushed, and the child tosses its hands above the head, or presses them on the forehead. In infantile remittent, the countenance, though occasionally flushed is generally pale and leaden or of a dingy pallid appearance; and the little patient is constantly picking the lips and nose with the fingers. In hydrocephalus headache is an almost constant symptom, and is often so acute as to cause the child to cry out "oh my head." It is, also, usually connected with much intolerance of light. In infantile remittent, headache rarely occurs, and when it does come on it is usually transient and connected with nausea or vomiting. In the early stage of hydrocephalus there is generally frequent vomiting particularly when the child is raised into a sitting or erect pos-

ture. In remittent fever, this is much less common, nor is apt to occur when the patient's head is suddenly raised. In the former affection, the abdomen almost always becomes flattened; whereas in infantile remittent fever, the abdomen becomes tumid, tense and elastic or hard. Goelis insists particularly on the importance of this circumstance, as a diagnostic sign in these affections. In idiopathic hydrocephalus, diarrhœa or looseness of the bowels scarcely ever occurs, in the early stage of the disease. In remittent fever, diarrhœa is no uncommon symptom, in the commencement of the complaint. In the former affection, the nostrils and mouth are dry, in the latter, they are generally moist with mucus, and the secretion of saliva is increased. The delirium of hydrocephalus, is generally more constant, and, after it has continued for some time, the patient cannot be roused from it, as in the remitting fever. The pulse also, is much more irregular and tense, and in the advanced stage, when stupor or coma is present, it, usually, becomes slow and intermittent. There is strabismus, deep sighing, sudden and violent screaming, and in most cases, constant rolling of the head, and frequent grinding of the teeth. In the infantile remittent the breath is often offensive, which is rarely the case in idiopathic hydrocephalus. In the advanced stages of the former complaint, there is almost invariably a great aversion to every kind of food; but in the latter disease, the patient frequently takes without reluctance, whatever is offered, "apparently making no distinction between what is palatable and what is nauseous." The alvine evacuation, will, also, aid us in forming a satisfactory diagnosis. In the fever under consideration the stools are always "remarkably changed from their natural appearance." They are sometimes perfectly black and glairy, resembling tar, with a smell that has been compared to putrid mud; at other times they consist of a dark green fluid mixed with shreds and flocculi of mucus. In hydrocephalus, the stools are, at first often light colored, and after the disease has continued for four or five days or longer, they frequently exhibit a foamy and light green appearance, of the consistence of thick syrup or pap, resembling chopped spinage. If after an attack of convulsions, the mental faculties are restored "and the history of the disease accord with the symptoms above described, we may securely pro-

nounce that the head is not the source of the convulsions, but that it is merely a symptom of intestinal irritation" (Pemperton). It may be observed, that when the symptoms are so ambiguous as to render it doubtful whether they depend on meningeal inflammation and effusion, or on mere sympathetic irritation and vascular tergescence of the brain, the exact diagnosis cannot be of material service in the treatment, since the same means are indicated, and would be used whether the cerebral affection be primary and independent, or secondary and symptomatic of gastro-intestinal irritation.

The usual exciting causes of the present variety of infantile remittent fever, are, improper food, a torpid state of the bowels, worms, vitiated or acrid secretions from the liver, cold and moisture, dentition, and perhaps deficient attention to cleanliness, pure air, and exercise. All who have written on this disease agree, in referring it to a primary irritation located in the stomach and bowels, with disordered functions of the biliary organs. Mr. Colley thinks, that the primary disorder consists in torpor or defective action of "some part, or of the whole of the chylopoictic system, and generally of the liver stomach and intestines." It is, indeed, sufficiently evident that both the stomach and bowels are extremely inactive, in this malady; digestion is soon entirely suspended; and, in the early periods of the complaint, the alvine evacuations often, indicate a deficient secretion of bile. In consequence of this torpid state of chylopoictic organs, the contents of the intestines, probably, undergo such chemical changes "as to become the source of extreme irritation" to the mucous membrane of the alimentary canal. The vitiated secretions from the liver and intestinal glands, also, contribute to the same injurious result; and it is not improbable that the blood itself, may undergo some morbid change, in consequence of the absorption of chyle imperfectly elaborated, and vitiated by the depraved fluids generated in the alimentary canal. The tendency of gastro-intestinal irritation to excite disease in other organs, particularly in the brain, is well known. Dr. Burns observes, that "we are not yet enabled to say, what particular mode of irritation gives rise to the different modifications of phenomena; or why, in one case the same apparent exciting cause should produce spasmodic, and in another

febrile affections." Broussais has thrown some light on this interesting subject. It would appear, that when the local irritation is purely nervous, the sympathetic consequences will be confined to the nervous system; but when the local irritation involves, also, the capillary blood-vessels, that is, when there is inflammatory irritation, the secondary effects will be febrile and inflammatory. Thus if some very indigestible substance be taken into the stomach, the immediate impression on the gastric nerves will be communicated to the brain, and convulsions or some other spasmodic or purely nervous affection will probably occur. If the substance remain long enough to excite local vascular irritation in the stomach or bowels, the sympathetic consequences will be febrile.

Treatment.—From the symptoms, causes and pathological character of this disease, it is obvious, that the principal objects to be kept in view in the treatment, are, to clear the bowels of their vitiated and irritating contents; to correct the biliary and intestinal secretions; to obviate cerebral irritation; and finally, to moderate the excessive action of the heart and arteries. In cases that come on suddenly after eating some improper substances, or overloading the stomach, the immediate exhibition of an emetic, followed, after it has ceased to operate, by an active purge, will in general suffice to put a speedy termination to the disease. The irritating causes are thus removed out of the alimentary canal, before they have excited a fixed inflammatory irritation, and the disease consequently speedily subsides. If, however, the offensive substances received into the stomach are peculiarly irritating, and a predisposition exists to inflammatory irritation in the mucous membrane of the alimentary canal, or in some other organ; or if proper evacuants be neglected soon after the accession of the fever, the disease will be apt to continue for many days, however diligently the stomach and bowels be evacuated by emetics and purgatives. It is generally very difficult to procure free evacuations from the intestines in cases of this kind, particularly when the disease has been excited by hard and very indigestible substances, such as cherry stones, orange peel, raisins, almonds, &c. In some instances, portions of the irritating substances are

retained, and discharged in an imperfectly digested condition, four or five days after they were taken into the stomach, although the bowels are daily evacuated by active purgatives. If the intestines resist the free operation of purgatives, active clysters ought to be administered to procure the desired effect. When the pulse is full and active, and particularly when the face is flushed and the head very hot, much benefit may be derived from bloodletting. It would seem that the intestinal torpor, in this complaint, frequently depends, in a considerable degree, on vascular fulness in the brain; and hence an efficient abstraction of blood, almost always increases the susceptibility of the bowels to the operation of aperients. It is not, however, merely on this account, that bleeding is proper, during the exacerbations of this fever. When the pulse is full and strong, the momentum of the circulation should be speedily moderated, with the view of obviating local inflammation and dangerous congestion.

In the second modification of the disease—that is, in those cases that come on gradually, emetics are much less important remedies, than in the preceding variety,—brought on suddenly, in consequence of the reception of irritating substances into the stomach. Nevertheless, if in the commencement of the disease there is reason to suspect the existence of offensive materials in the primæ viæ, more especially when the patient is affected with nausea or retching, the exhibition of a gentle emetic, generally produces a very beneficial effect. The bowels should, in the first place, be thoroughly evacuated, and aftewards kept in a loose state by the regular employment of suitable aperients. It is often as difficult to procure free evacuations from the bowels in this as in the preceding modification of the disease. In general, however, sufficient purging may be excited by the administration of from six to eight grains of calomel, followed, in four or five hours, by a full dose of castor oil, or of infusion of senna and manna. In some instances of extreme torpor of the bowels in this affection, I have obtained very copious purging, by the employment of castor oil in union with the spirits of turpentine, some hours after the exhibition of a dose of calomel. A dessert spoonful of the oil with twenty or thirty drops of the turpentine may be given every hour, until active purging is produced. Calomel, however, both

as a purgative and an alterative, is, undoubtedly, the most important remedy we possess in the treatment of this malady. After the alimentary canal has been well evacuated, this article ought to be regularly employed with a view to its constitutional or alterative influence, as well as to its aperient operation. Whether the liver be torpid or otherwise, it is quite certain that its functions are much disordered; and, until the morbid condition of this important organ is improved, no favorable change can take place in the general state of the disease. With this view, calomel should be exhibited, in small doses, three or four times daily, and its laxative effects promoted by the occasional administration of a dose of castor oil, or of epsom salts. It may be very advantageously given in union with small portions of ipecacuanna or of the pulvis antimonialis. I have generally prescribed a grain of calomel with half a grain of the antimonial powder, three times daily; and, on the following morning one or two drachms of epsom salts, or a few teaspoonfuls of castor oil. This course should be pursued until the alvine evacuations begin to exhibit a more natural appearance, after which the calomel must be given at more remote intervals, or wholly laid aside. In general more benefit may be derived from small and repeated doses of calomel than from large ones less frequently administered. Although purgatives are always decidedly indicated in the treatment of this affection, yet very active purging, after the bowels have been freely evacuated, is, as a general rule, by no means advisable. The daily employment of drastic, or very active purgative remedies, is apt to give rise to inflammatory irritation of the mucous membrane of the bowels, attended with muddy or reddish watery stools, and a tender, swollen and tympanitic state of the abdomen. Two or three alvine evacuations, in the course of twenty four hours, are sufficient to prevent any injurious accumulation of acrid or vitiated secretions. After the disease has continued for two or three days, and the fæculent contents of the intestines have been well evacuated, the milder purgatives, only, ought to be employed, in the way mentioned above. If these do not procure sufficient discharges, their operation on the bowels ought to be assisted by active clysters.

If in the commencement of the fever, the pulse is full, active

and firm, more especially, when the child is of a robust and plethoric habit, or when there are decided indications of strong sanguineous congestion, and irritation in the brain, blood ought to be abstracted, either with the lancet or by leeching. Even in the advanced stages of the disease, blood-letting may sometimes be resorted to with much advantage, when the head is much affected and the pulse is still active and tense. If, after the disease has continued for five or six days, the pulse continues to be full and pretty active during the exacerbations, the abstraction of three or four ounces of blood, seldom fails to make a favorable impression on the disease. When strong delirium or a state of stupor supervene, and the momentum of the general circulation has been moderated, much benefit may occasionally be derived from leeching behind the ears or on the temples. In general, however, more advantage may be obtained, under these circumstances, from cold applications to the head, than from local depletion. I have frequently known, the symptoms of cerebral irritation and congestion in cases of this kind, speedily and very greatly moderated by the continued application of cold water or ice to the top and forepart of the head. If the feet are cool, which, in the latter period of the disease is sometimes the case, they ought to be excited by stimulating frictions or by warm applications, at the same time that cold is applied to the head.

Besides the remedies already mentioned, diaphoretics also, are very useful means for reducing the febrile reaction. The skin is generally obstinately dry and very hot; and a free action of the cutaneous exhalents is almost invariably attended with obvious abatement of the general febrile irritation. A simple solution of tartar emetic in water, or the antimonial wine, given in small but repeated doses so as to keep up a slight degree of nausea, will frequently do considerable good. I have often employed the following mixtures with unequivocal benefit.* To a child of from three to six years old a dessert spoonful should be given every two hours during the exacerbations of the fever. A mixture of spirit.

* ℞ Nitrat potassæ ℈ii; pulv. extract. glycyrrh. ʒii; tart. antimonii, gr. i; spirit. nit. dulc. ʒii; aq. fontanæ ℥iv. M. ft.

℞ Muriat. ammon. ʒi; or pulv. extract. glycyrrh. ʒiii; vin. antimon. ʒii; aq. fontanæ ℥iv. M. ft.

menderiri, and the sweet spirits of nitre, in the proportion of an ounce of the former to a drachm of the latter, and sweetened with lemon syrup, forms also an excellent diaphoretic, in this complaint. One or two teaspoonfuls should be given, every two or three hours, according to the age of the patient. If, after the violence of the febrile reaction has been moderated, the brain continues to be in an irritated or congested condition, that is, if much delirium or stupor be present, blisters applied to the back of the neck, at the same time, that cold applications are made to the head, will sometimes procure very considerable relief.

It is often very difficult to determine whether the manifestations of cerebral disturbance arise from incipient inflammation, or from mere sympathetic irritation of the brain. If the former be the case, opiates, are of course wholly inadmissible; but, in instances of the latter condition, they often produce a highly salutary effect. In general, when at an advanced period of the disease, the delirium and cerebral disturbance is associated with a small, frequent and feeble pulse, a pale and sunken countenance, great jactitation and cool hands and feet, and especially when with these symptoms the patient can be roused from his stupor or delirium, opium may be employed with a prospect of much advantage. The best mode of using this narcotic is in the form of Dover's powder, in union with small portions of calomel. I have in some instances derived very great benefit from the administration of this remedy, in grain doses repeated every three or four hours. When the cerebral disturbance is entirely irritative and symptomatic of gastro-intestinal irritation, the pulse becomes softer and slower, the skin moist and of a natural temperature, and the patient falls into an easy and sound sleep, as soon as the system is under the influence of the opium. When he awakens his mind is usually much tranquillized, and the whole aspect of the disease is sometimes changed for the better. In the latter period of the disease, when the fever is about subsiding, the patient, though not distinctly delirious, is occasionally extremely restless, and unable to obtain any sleep during the night. In instances of this kind, two or three grains of Dover's powder, given in the evening, generally produces a very soothing effect. It must be particularly observed however, that, although often highly beneficial in the advanced periods of the disease,

opium can very rarely be employed at an early stage, or before the febrile reaction has been considerably moderated by evacuants without incurring much risk of serious injury. In feeble and sickly children, I have occasionally administered a few grains of this anodyne, after the free operation of a purge, with evident advantage, at an early period of the complaint. In these cases, however, the face was not flushed and the patient was very restless instead of drowsy, as is usually the case, during the exacerbations.

When the abdomen becomes tumid and tender to pressure, the application of a few leeches to the epigastrium generally produces a very good effect. A large emolient poultice laid over the whole abdomen, may also be resorted to, with much advantage in cases of this kind. The abdominal tumor in such cases, arises from flatulent distention of the bowels; and hence the expulsion of the confined flatus, frequently affords immediate relief. For this purpose injections of a watery solution of assafœtida, may sometimes be used with considerable benefit; but the remedy which has most frequently succeeded, in my hands, in reducing the abdominal distention, is the spirits of turpentine, administered internally, in doses of from eight to twelve drops three or four times daily. In very protracted cases, when the system is much prostrated and the bowels are in an irritated and tympanitic condition this article is indeed a very excellent remedy. It not only excites the bowels to contract, and to expel the confined wind, but it often exerts an evident beneficial influence on the intestinal secretions, and, it would seem, on the irritation of the mucous membrane of the stomach and bowels.

After the disease has been in a great measure subdued and the alvine evacuations have acquired a natural appearance, mild tonics may sometimes be used with considerable benefit, during convalescence. A weak infusion of bark, or of colombo, will answer well for this purpose. I have in several instances used finely powdered charcoal, in union with powdered ginger, with very obvious benefit. From ten to fifteen grains of the former, to six or eight grains of the latter article, may be given three or four times daily.

The diet ought to be of the lightest and most unirritating kind possible. During the active stages of the disease, toast water,

thin barley water, or rice water, will be sufficient. Every kind of solid food must be rigidly prohibited. For drink, the patient may use weak lemonade, toast water, and occasionally a table spoonful or two, of fresh water. During convalescence, chicken, lamb, or mutton broth, boiled rice, arrow root &c. will be proper.

CHAPTER XXV.

CATARRH. CATARRHAL FEVER.

Catarrhal affections under various forms and grades of violence, are among the most common diseases of infancy and childhood. These complaints are particularly apt to occur during raw, variable, and humid weather, and hence they are most frequently met with in the spring and winter, more especially when the latter season is moist and open. It is also, apt to occur during summer, when after a long spell of damp and clear weather, the atmosphere suddenly becomes dry and very hot. Catarrhal fever sometimes prevails epidemically, and the disease has been known to confine itself, in a great measure, to children. An epidemic of this kind occurred throughout the eastern states in 1824, in which by far the greater number of cases were among children.

This malady is characterized by fever, cough, slight hoarseness, some difficulty of breathing, running at the nose, sneezing, and that peculiar watery appearance of the eyes which occurs in the commencement of measles. The disease begins with a slight feeling of chilliness, and occasionally with a distinctly formed chill. The hands and feet become cold, the whole surface of the body pale and contracted, and the patient appears languid and drowsy. This state of depression frequently continues for a whole day before the febrile reaction is fully developed. In

many instances, however, the fever supervenes in a very short time after the first feelings of indisposition. The patient complains of aching pains in the extremities and back, the pulse becomes frequent, somewhat tense and generally full, the cheeks flushed, the eyes suffused with tears, and a thin transparent fluid usually issues from the nose attended in the commencement with frequent sneezing. The skin is dry and husky, though seldom much above the natural temperature. The bowels are torpid, and the urine scanty and high-colored; and, in many instances the alvine evacuations, during the first few days, manifest a deficient secretion, and sometimes an entire absence of bile. In some cases, cough with slight hoarseness, is one of the earliest symptoms; more frequently, however, the cough does not come on until the fever is fully developed, and often not until the disease has continued for two or three days. The breathing is not often much oppressed in the early periods of the disease, though frequently attended with considerable rattling in the trachea. In severe cases, however, respiration is frequently difficult and wheezing, almost as soon as the fever is developed, owing to the abundant secretion of mucus into the air cells. This is most apt to be the case in infants, who, from not making any efforts to relieve the lungs by expectoration, suffer the bronchial secretions to accumulate, in the air passages. Hence the operation of an emetic, or spontaneous vomiting, by expelling the mucus from the bronchia, is always followed by an immediate, though but temporary cessation of the pectoral oppression and dyspnœa. In general, the more violent the cough is in the early stage of the disease, the less mucus is secreted and discharged from the lungs; and when the bronchial irritation is about passing into inflammation, the cough, usually, becomes perfectly dry. In the ordinary form and course of the disease, the expectoration becomes very abundant, after the fever has continued for three or four days; and as the copious secretion of mucus keeps up a constant irritation of the bronchia, the cough, usually becomes very frequent as the disease advances.

The liver, often, is much affected in this variety of fever. In infants, the epigastrium and right hypochondrium, sometimes, become tumid, tense and sore to pressure—a condition, which

has led to the vulgar notion that the child is "liver grown," as it is called. The liver, in cases of this kind, is evidently greatly engorged with blood, attended with more or less functional torpor. During the first two or three days, the discharges from the bowels are frequently whitish or clay-colored; but as the disease advances, an abundance of light-green or dark bile appears in the evacuations. In violent cases, delirium sometimes occurs, particularly in the afternoon and at night. There is generally a distinct remission of the febrile symptoms, in the morning, though usually of very short duration.

The occurrence of bile in the evacuations, if accompanied with a soft and moist skin, and a more copious secretion of urine, is almost always followed by a speedy declension of the disease. When, on the contrary, the alvine discharges become watery and muddy, or reddish, with shreds and flocculi of mucus, resembling the washings of flesh, attended, as these discharges almost invariably are, by a bloated or tympanitic state of the abdomen, and a very dry and harsh condition of the skin, the worst consequences are to be apprehended. When death takes place, at an early period, it is generally from engorgement of the lungs and sudden effusion into the air cells, or from the supervention of bronchial or pneumonic inflammation. The occurrence of convulsions, in this complaint, is always a highly unfavorable circumstance. Great somnolency or drowsiness, when attended with difficult breathing, is also very unfavorable, as they indicate strong cerebral and pulmonary congestions.

During the declension of the disease, a very copious discharge of thick mucus generally occurs from the nose, and trachea; and this, with the cough, often continues for several weeks after the fever has completely subsided.

Treatment.—In prescribing for this disease, we must endeavor to restore the regular action of the skin and liver; to moderate the febrile excitement of the heart and arteries; to allay the irritation of the mucous membrane of the respiratory passages, and to obviate local congestions or inflammations. The bowels should, in the first place, be freely evacuated, by a full dose of calomel, followed, in three or four hours, by a dose of castor oil, magnesia, or infusion of senna and manna.

If the pulse is full and active, or when symptoms of severe pulmonary congestion or inflammation occur, blood ought to be drawn, so as to make an obvious impression on the circulation, either with the lancet or by leeching. When the child complains of pain in the chest, or when the breathing is laborious, this measure is of great importance, and should never be neglected. In many cases, however, the pectoral symptoms are slight and the pulse is not sufficiently active to require or warrant the abstraction of blood. As soon as the bowels have been well evacuated, recourse should be had to antimonials, and to small doses of calomel in union with ipecacuanna, with a view of exciting the cutaneous and hepatic secretions and keeping up a moderate action of the bowels. From a quarter to a half a grain of calomel, with a half a grain or a grain of ipecacuanna, according to the age of the patient, may be given three or four times daily, until the stools have become distinctly bilious. When this occurs, a dose of castor-oil, or of magnesia should be administered, so as to procure pretty free purging. At the same time that this remedy is employed, small doses of tartar emetic may be very beneficially administered. The best way, perhaps, of employing antimony in this disease, is to give it in combination with some mild expectorant mixture. I have found the following, very excellent mixtures for this purpose.* A teaspoonful may be given to an infant every two or three hours. After the febrile reaction has been moderated, or where it is feeble in the early stage of the complaint, much benefit will often result from the use of small doses of Dover's powder. Where however, the lungs are much oppressed, by too copious a secretion of bronchial mucus, and the patient appears drowsy, opiates are decidedly improper in infants; for, if the bronchial irritation is lulled by the use of opium, the cough will be suspended, and suffer the mucus to accumulate to a dangerous extent in the air cells and bronchia. When the breathing is oppressed from this cause in infants, nothing affords more certain and speedy relief than the

* ℞. Muriate of ammonia, ℈ii; Extract. Glycyrrh. ʒiii; Aq. fontanæ, ℥iii; Tart. Antimonii, grs. ii; Syrup. Scillæ, ʒiii. M.

or

℞. Spirit. Minderiri, ℥ii; Syrup. Scillæ, ℥ss; Vin. Antimonii, ʒii; Spirit. Nitri Dulc. ʒiii; Sacch. Albi ℥ss. M.

operation of an emetic. The concussive action of vomiting, rarely fails to free the lungs from the viscid mucus, that may be lodged in the bronchia and air cells. When the pectoral oppression is severe, a large emolient poultice laid over the breast, will, frequently, procure considerable relief; but when the cough is violent and painful, and the breathing laborious, a blister applied to the chest will be the most effectual means of relief and ought not to be neglected. To promote the action of the cutaneous exhalents, the warm bath is sometimes very beneficial, particularly after the acute symptoms have, in some degree, subsided. During the declension of the disease, expectorants and small doses of opiate remedies, are usually of essential service. A mixture of equal parts of tinct. opii. camphoratæ, syrup of squills, and sweet spirits of nitre, forms an excellent remedy for this purpose. From twenty to sixty drops, according to the age of the patient, should be given three or four times daily. The hive syrup, and brown mixture,* are also very useful expectorants, in the latter stage of the disease.

Congestive Catarrhal Fever.—Infants are liable to a catarrhal affection, in which the prominent symptoms are those of violent pulmonary congestion, with but little or no development of febrile excitement. So far as I know, Dr. Parrish, of Philadelphia, is the first, who has given a particular account of this dangerous malady.† This modification of the disease commences with cough, and the breathing soon becomes laborious and wheezing; the face is very pale, and the whole surface cold, though generally soft or moist. The pulse is considerably accelerated, but is free from tension, quickness, or firmness. The countenance acquires a peculiar expression of distress and anxiety, and in severe cases, the cheeks become very cold even when the other parts of the surface, are of a natural temperature. The stomach and bowels are generally inactive, and the urine is small in quantity, but so far

* ℞. Extract. glycyrrh. ʒii; Aq. fontanæ ℥iv; Vin. Antimonii ʒii; Tinct. Opii. Camph. ʒii. M. Dose from one to two teaspoonfuls every three or four hours, according to the age of the child.

† Observations on a peculiar Catarrhal Complaint in children. By Joseph Parrish, M. D. &c.—See, North American Medical and Surgical Journal. vol. i. p. 24.

as I have observed, nearly of a natural or healthy color. After the disease has continued for some time, a cold perspiration sometimes breaks out on the face and neck. The cough is at first dry, attended with a wheezing sound in the chest; but towards the termination of the complaint, it frequently becomes humid or rattling. The pulse, in violent cases, becomes very small and rapid, and the tendency to sinking, is in all instances, very obvious. There is constantly much difficulty of breathing, but at times, the oppression becomes so great as to resemble a violent attack of asthma. Occasionally considerable remissions occur, for a short period, during which the pulse will become somewhat fuller and slower, and the countenance brighter and more calm. When the disease is tending to a fatal termination, the patient becomes drowsy, insensible and comatose, and death takes place, by suffocation, or in a paroxysm of convulsions.

This disease seldom continues longer than two or three days, and in very young infants, death sometimes takes place, in the course of the first day. It is most frequently met with in infants under a year old, and I have witnessed several cases during the first month. After dentition is completed, catarrhal affections appear to be less apt to assume this congestive character; although violent pulmonary congestion and fatal effusion into the air passages, occur at every period of life as consequences of pneumonia or bronchial inflammation.

Dr. Parrish thinks that the dyspnœa, which forms the prominent symptom of the disease, "is undoubtedly of a spasmodic character," depending probably on "a constitutional debility of the respiratory organs." My own observations have led me to a very different conclusion. From carefully attending to the phenomena and progress of several cases of this kind, I am entirely convinced, that the oppressed respiration and other characteristic symptoms of this disease, depend mainly if not wholly on great sanguineous engorgement of the pulmonary blood-vessels. The disease is manifestly catarrhal; but the lungs are, at once, so entirely oppressed by excessive sanguineous congestion, that the vital energies are too much depressed to admit of the development of distinct febrile reaction, and local inflammation. It seems to me to bear the same relation to acute bronchitis or

peripneumony, that apoplexy or coma does to phrenitis. It is a kind of apoplexy of the lungs. Extremely oppressed respiration, paleness of countenance, cough, and coolness of the surface, are precisely the phenomena we should expect to occur, from excessive sanguineous engorgement of the lungs. Dr. Parrish uses antispasmodics, particularly assafœtida and the oil of amber in the treatment of this malady; and he seems to regard their apparent usefulness, as an evidence of the correctness of his opinion on this subject—namely, that the "dyspnœa is undoubtedly of a spasmodic character." It must be observed, however, that he employs, also, emetics, purgatives, blisters to the breast, and the warm bath; and although he regards them only as "useful auxiliaries" to the assafœtida and oil of amber, they are just such remedies, as one would place most reliance on for the removal of pulmonary congestion; and I cannot doubt that they were in reality the means which effected the beneficial results in the cases he has reported.

Treatment.—The principal object in the treatment of this complaint, is to relieve the congested condition of the lungs, and to prevent the development of inflammation. The child should be immediately placed in a warm bath, and an antimonial emetic administered. Vomiting seldom fails to procure some benefit: but the relief obtained from it, is generally temporary, and in the beginning of the disease, sometimes but very slight. The most effectual means for relieving the lungs, is the application of a large epispastic over the breast, and this should never be omitted when the pectoral oppression is severe. The bowels, also should be freely evacuated; and for this purpose, a full dose of calomel is, perhaps, the most beneficial. Frequent and very active purging, however, has appeared to me injurious in this complaint. After the intestines have, in the first place, been well evacuated, it will, I think, be best to keep them in a loose state, by the exhibition of a moderate dose of calomel in the evening, assisted .f necessary, next morning, by a small portion of castor oil. To determine the circulation to the inferior parts of the body, some advantage may also be derived from the application of sinapisms to the feet. Dr. Parrish speaks very favorably of the use of assa-

fœtida and the oil of amber. He mentions an extreme and an apparently hopeless case, the unexpected recovery of which he ascribes chiefly to the agency of the former of these antispasmodics. "I should," he says, "have despaired of the case, had I not known under what apparently hopeless circumstances infants sometimes recover. I ordered the warm bath, sinapisms to the feet, a large blister over the breast, and laxative injections containing assafœtida. But the remedy on which I chiefly relied, was assafœtida rubbed up with mint water, given frequently and in large doses. To the astonishment of every one who witnessed the case, my little patient perfectly recovered." The assafœtida, doubtless, had its share in the production of this fortunate result; but this case certainly cannot be regarded as a fair example of its efficacy, since the other means employed along with it, are by themselves, generally, sufficient to remove the disease. I have never yet employed any antispasmodics in the treatment of this affection—having always relied, principally, on the remedies already mentioned, particularly blistering, the warm bath, and emetics. When the pulse is very feeble, wine-whey, or a weak solution of the carbonate of ammonia may be used with much advantage. I would not, however, say any thing against the free employment of assafœtida; on the contrary, the authority of Dr. Parrish, is sufficient to convince me, that it is a remedy of excellent powers in this complaint. I doubt, however, whether its good effects can be justly ascribed to its antispasmodic operation. It is rather by a general stimulant and expectorant influence, I conceive, that it contributes to the reduction of this formidable malady. Dr. P. directs, that one drachm of this gum, be rubbed up with an ounce of mint-water, and given in teaspoonful doses, repeated every two hours. "If this shall be found too strong, it should be diluted, till of such a strength as the child can bear."

I have as yet said nothing of blood-letting. When there is considerable fulness and activity in the pulse, the abstraction of a small quantity of blood, with the lancet, is often highly beneficial. I have, in some instances, procured prompt and very decided relief by bleeding. When the pulse is very frequent, small, and feeble, as it sometimes is, blood cannot be drawn without considerable risk of increasing the prostration to a fatal

extent. Before bleeding is resorted to, where the state of the pulse does not distinctly indicate the propriety of the measure, it will, in general, be best to premise the use of the warm bath, and the application of sinapisms to the feet. If these do not, in some degree, increase the fulness and force of the pulse, it will be most prudent to abstain from drawing blood.

In moderate cases, I have known very obvious benefit to result from the application of a large emolient poultice, renewed every two or three hours, so as to keep it sufficiently warm and moist.

When the bronchial exhalents begin to relieve themselves, by secreting an abundance of mucus; or when the respiration and cough are attended with a rattling sound in the chest, the hive syrup, or a decoction of the seneca root, repeated at short intervals, until vomiting is produced, will sometimes procure very considerable relief. Opiates are, in general, decidedly improper in this affection, particularly in very young infants, and when the secretion of bronchial mucus is copious. Dr. Parrish, says that the fumes of rosin "are often highly beneficial." I have myself, in one instance, resorted to the inhalation of these fumes, with an evidently beneficial effect on the breathing.

CHAPTER XXVI.

ACUTE BRONCHITIS.

This disease, as it occurs in infants, often bears a close resemblance, in its early stage, to the congestive complaint described in the preceding section. They are, indeed, produced by the same cause; but in the present disease along with the sanguineous engorgement of the lungs, more or less inflammation, is developed in the mucous membrane of the bronchia.

The disease usually begins, with chilliness, or a cold and contracted state of the surface, a languid and pale appearance of the countenance, slight cough, and some difficulty of breathing. After some time, the pulse becomes frequent, quick somewhat full and resisting. The cough increases, is slightly hoarse, and has a stifled sound. The breathing also, rapidly becomes more and more oppressed and laborious. When the child is old enough to give an account of its sensations, it complains of a feeling of weight and tightness in the breast, but seldom of any pain. Nevertheless, when the cough is violent, infants sometimes cry out, as if from pain; and the inspirations are occasionally catching and attended with an expression of pain in the countenance. At first the breathing and cough are dry, but in the course of the first twelve hours, and often soon after the commencement of the febrile reaction, a copious secretion of transparent, viscid mucus takes place, into the bronchia. In most instances, vomiting occurs during the first twenty-four hours; and the epigastrium frequently becomes distended and elastic. As the disease advances, the mucous secretion into the air cells and bronchia, increases progressively; the child becomes drowsy, the lips livid, and the countenance expressive of great distress, the muscular debility is always very great. When the

disease is once fully developed, the child often manifests much uneasiness by being placed in the recumbent position. The countenance is very rarely, even slightly, flushed; on the contrary, throughout the whole disease, it is almost invariably extremely pale and anxious. Towards the fatal termination, the cheeks and lips sometimes acquire a slightly livid hue. The temperature of this surface, is generally somewhat above the natural standard, on the trunk,—but the hands and feet, are frequently cool or about the regular temperature. The difficulty of respiration, is not uniform. Occasionally it is pretty easy, for a short period, and then suddenly, becomes, extremely oppressed. The cough too, after the disease has continued, until the secretion of bronchial mucus is very copious, becomes, in a manner, paroxysmal—violent spells coming on at irregular, and generally short periods, with comparative exemption from it, during the intervals.

The progress of the disease, is generally rapid. In some instances it terminates fatally as early as the third day; more frequently, however, its course is protracted to the sixth day. Great drowsiness or coma, almost invariably precedes the fatal termination. But even after the lungs appear to be completely clogged with the effused mucus, and the child has sunk into a comatose state, "gleams of hope sometimes burst upon us. For a short time the difficulty of respiration may seem to subside, and the child to be better. But these hopes are very rarely realized; for even the next exacerbation of dyspnœa may terminate in suffocation."

On dissection the lungs do not collapse when the thorax is opened. The whole structure of the lungs, usually appears, infiltrated, or engorged with a thin viscid fluid. The mucous membrane of the bronchia, is generally of a bright red color, from minute injection of its capillary vessels. The smaller branches of the bronchia, are commonly filled with tough mucus, bloody serum, or purulent matter. In those cases that succeed pustular exanthematous affections, the mucous membrane of the large bronchial tubes, sometimes presents a number of very small ulcerations, and slight fungoid elevations. In severe cases, it is not uncommon to meet with a red hepatized condition, of a

portion of the lungs; and occasionally there is an approach towards the formation of tubercles.

The great muscular prostration and somnolent condition which occur in this disease, doubtless, arise from deficient decarbonization of the blood; for death generally occurs from asphyxia, or suffocation, in consequence of the entire obstruction of the air cells, and smaller bronchial branches, by the viscid mucus so copiously secreted in this affection. It seems probable, however that death sometimes occurs, also in consequence of the inflamed mucous membrane preventing the atmospheric air from producing the necessary change in the veinous blood. Cases of fatal dyspnœa are related by M. Andral, jr. in which no effusion or redundant secretion of mucus had taken place, nor any lesion of the proper substance of the lungs, discovered on dissection. It seems highly probable, that, whether the oxygen enter into the blood-vessels, or the carbon be thrown out through the mucous membrane, the regular influence of the air, on the veinous blood, will be impeded or perverted when this delicate structure is in a state of intense inflammation. The difficulty of respiration which occurs in the early stage of this complaint, is, perhaps, chiefly attributable to this cause, and not to the clogging of the bronchial cells, by viscid secretions, as is generally supposed.

Treatment.—Blood-letting is in general a highly valuable means of relief, in the early stage of this affection. In robust and plethoric infants, particularly when the pulse is active, prompt and efficient, bleeding, either with the lancet or by leeching, may be deemed indispensable. The period, however, during which this measure may be resorted to with a prospect of advantage is not very long. The blood ought to be abstracted at an early period —as soon after the inflammation is developed, as possible. If it be delayed, until effusion or a copious secretion of bronchial mucus has taken place, the chance of benefit from it, will be but very small, and injury, probably, will be the result. If the cough is dry, and the respiration not attended with a rattling sound in the trachea, blood may be drawn, with a fair prospect of advantage; and a sufficient quantity ought to be taken away, at the first bleeding, to make an obvious impression on the action of the heart and

arteries. Much benefit may be derived from the application of leeches to the chest; more especially, after blood has been abstracted with the lancet. No remedy, however, contributes more powerfully to the reduction of the bronchial inflammation than blistering. As soon as blood has been efficiently abstracted or at once in the very commencement of the disease if the pulse be small and feeble, a large epispastic ought to be laid over the breast and suffered to remain until the skin is uniformly inflamed. It must then be removed and a large emolient poultice laid over the part.

The bowels should be freely evacuated, by a full dose of calomel and rhubarb; and afterwards kept in a loose state by purgative enemata, and small doses of some of the milder laxatives. Half a grain of calomel with the same quantity of ipecacuanna may be advantageously used for this purpose. Emetics also are very useful remedies, in this affection. They generally procure immediate relief of the oppression in the chest, by expelling the viscid mucus which clogs the bronchial cells, and diminishing the pulmonary congestion. A mixture of antimonial wine and syrup of squills, in the proportion of one part of the former to three parts of the latter, forms an excellent emetic, for this purpose. A teaspoonful of this mixture should be given every twenty minutes, until active vomiting is excited. Expectorants may also be used with advantage in this affection. In the early period of the disease, the more stimulating articles of this kind must be avoided. I have frequently employed the following mixture, for this purpose, with evident benefit.* After the febrile reaction has been moderated and there is much secretion into the bronchia, the more stimulating expectorants, will be proper. The following combination, frequently, produces a very good effect, in the advanced periods of the disease.† When there is much prostration, or when the pulse is small and feeble, in the latter stage of the disease, stimulants should be used, along with expectorants. The carbonate of ammonia is an excellent remedy in this state of the disease. It

* ℞. Tart. antimonii. gr. ii; sal. tart. ʒii; aq. fontanæ ℥iiss mel. opt. ℥iss. M. Dose, a tea spoonful every hour or two.

† ℞. G. ammoniæ ℈ii; infusio polygala senegæ ℥iv; syrup scillæ ℥ss. Dose, a teaspoonful, every two hours.

may be given according to this formula.* Hoffman declares, that he has known a combination of the flowers of benzoin and camphor, to procure complete relief, in cases, apparently hopeless. To an infant, of from one to three years old, a quarter of a grain of the former article with half a grain of the latter, rubbed up with a small portion of sugar, may be given every two hours.

Opium is seldom beneficial in this disease; and may readily do a great deal of harm, by suspending, for a time, the efforts to expectorate, and thus giving rise to a dangerous accumulation of mucus in the bronchial tubes. When the cough remains dry, (which however, is rarely the case) and the momentum of the circulation has been diminished by depletion, considerable benefit may be derived from the judicious employment of this narcotic. In such cases, small doses of Dover's powder, in union with calomel, generally moderate the violence of the cough, and assist expectoration. To allay general irritation, and restlessness, during the declension of the disease, the tincture of hyoscyamus or of belladonna is often very useful. Exhibited in doses of from two to four drops every four hours, it seldom fails to tranquillize the nervous system, and to moderate the cough. When the skin is slow in resuming its regular perspiratory action, these narcotic tinctures may be very beneficially given in union with antimonial wine.

* ℞. Carbon. ammon. ℈ii; ext. glycyrrh. ʒii; aq. fontanæ, ℥iv, acid. scillæ ʒii. M. Dose, a tea spoonful every hour or two.

CHAPTER XXVII.

PLEURITIS.

Inflammation of the pleura is a much more common affection, during infancy than many suppose.* It commences as other inflammatory affections do, with a feeling of chilliness and a pale and contracted state of the surface. This is soon succeeded by high febrile reaction. The skin becomes very dry and warm, the face flushed, and the pulse frequent, full and strong. The breathing is hurried, short and somewhat oppressed, particularly when the patient is lying down. The cough is at first dry and short, and the infant evidently endeavours to stifle it as much as possible, to avoid the pain which it always occasions. When the child is laid down, it generally begins to cough and cry, and the muscles of its countenance are contracted into an expression of pain and suffering. There is also much more cough and uneasiness, when the patient lies on one side than on the other. In some instances, the patient rests easiest when lying on his back, with the head and shoulders raised, both sides being equally affected. Sometimes each inspiration is attended with a whine or moan, and the countenance is always expressive of pain. If the disease is not early moderated, or checked in its course, the breathing becomes more and more difficult and painful; and if any of the viscid bronchial mucus is thrown out, it is frequently found streaked with blood. "The cough is attended with a rattling sound in the trachea; the extremities become cold; the countenance often slightly livid, and the patient finally sinks into a state of drowsiness or stupor. The pulse, at last, becomes irregular, and often intermittent, the extremities swell, the breathing becomes short, and a frothy fluid oozes from the mouth." During the whole course of the disease the respiration is performed, chiefly by the

* Dr. Burns.

action of the abdominal muscles, and diaphragm—the motion of the chest being instinctively restrained by the patient, on account of the increase of pain which the dilatation of the thorax or elevation of the ribs always occasion in the inflamed pleura.

On post mortem examination, the pleura is generally found uniformly red, or punctuated with an infinitude of red specks of irregular shape, and very close together. In many cases a considerable quantity of serum is effused into the cavity of the pleura; and adhesions, more or less extensive, between the costal and pulmonary pleura occur in the majority of instances. Occasionally, some portions of the lungs are found hepatized; and a general infiltration of serum into the pulmonary structure is not uncommon.

The occurrence of diarrhœa in this disease, is always an extremely unfavorable circumstance; convulsions and coma, too, are no less ominous of a fatal tendency. Great distress and agitation, when placed in recumbent position, particularly when the breathing is attended with a wheezing sound in the trachea, and the pulse is small and irregular are extremely unfavorable signs.

When the skin becomes uniformly moist, the pulse less frequent and soft, the cough attended with a free discharge or raising of bronchial mucus, and the patient is able to rest on either side, a favorable termination may be confidently expected.

Treatment.—Prompt and very efficient blood-letting is indispensable in the treatment of this form of pectoral inflammation. Blood should be freely drawn with the lancet, until a decided impression is made on the pulse. The early application of leeches to the chest is also a highly important measure. As soon as the momentum of the circulation has been moderated, a blister ought to be laid over the breast, and managed in the way mentioned in the preceding chapter. The bowels must in the first place be freely evacuated, by an efficient dose of calomel and rhubarb, and kept in a loose state throughout the whole course of the disease, by small doses of calomel and ipecacuanna, or suitable portions of epsom salts.

The cooling diaphoretics are very useful auxiliary remedies in this affection. The nitrate of potash with minute portions of an-

timony generally contributes materially to the reduction of the febrile irritation. The following is an excellent mixture for this purpose.* Small doses of the pulvis antimonialis, in union with calomel, may also be employed, with much advantage, when the skin is very dry and warm. With the view both of diminishing the action of the heart and arteries, and of promoting expectoration, a simple solution of tartar emetic, given in very small but frequent doses, often proves decidedly beneficial. Dr. Burns says, that antimonials ought never to be given, in this complaint, to the extent of producing "decided sickness." I have witnessed no evil consequences from nauseating doses of tart. emetic, in the present disease, but, on the contrary, often unequivocal benefit. I have generally made it a point to administer this article so as to produce slight manifestations of nausea; and I am persuaded, that in the early stage of the disease, while the pulse is active and the skin hot and dry, much advantage will in general, result, from this mode of employing antimony. As a diaphoretic expectorant, the *kermes mineral*, given according to the formula below,† sometimes produce a very good effect, particularly when the cough is dry and harsh. If after the disease has been in a great degree subdued, the cough continues to be very severe, and the patient is restless, considerable benefit may sometimes be obtained from the use of small doses of Dover's powder. A few grains administered, once or twice daily, usually has the effect, of improving the expectoration, allaying the pain and restlessness, and exciting the regular action of the cutaneous exhalents. This article is particularly useful, during convalescence from this and other forms of pectoral inflammation, more especially when the pulse is small, and irritated and the skin dry. In the advanced stages of the disease, when (although the local inflammation and fever, appear to be almost entirely subdued,) the child is incapable of resting in a recumbent posture, the employment of diuretic remedies is sometimes attended with marked

* Nitrat. potassæ, ℈ii; extract. glycyrrh. ʒii; tart. antimonii gr. ii; sacch. albi. ℥ss; aq. fontanæ ℥iii. M. Dose, one or two teaspoonfuls, every hour or two, according to the age of the patient.

† Kermes mineralis gr. xv; extract. glycyrrh. ʒii; aq. fontanæ ℥iii.; syrup Scillæ ʒii. M. Dose, a teaspoonful every two or three hours.

benefit. In cases of this kind there is often a considerable quantity of serum effused into the cavity of the pleura, so that the moment the child is laid down, with its head low, it becomes agitated and begins to cough, pant, and cry. To promote the absorption of the effused fluid, small doses of squill and calomel, ought to be given three or four times daily, until the child is able to sleep in a horizontal position. The fourth of a grain of dried squills with the same quantity of calomel forms a full dose for a child, of from one to three years old. A mixture of the tincture of digitalis and vinegar of squills, in equal quantities, may also be used for this purpose; and I have known much benefit to result in this respect, from a mixture of equal portions of the syrup of squills and the sweet spirits of nitre, given in doses of from twenty to thirty drops, three or four times in the course of a day. When after the pleuritic symptoms have been removed, the child continues to be affected with cough, and a short and uneasy respiration, no remedy has appeared to me so valuable as the *tincture of sanguinaria Canadensis*. I have rarely known it to fail in removing the pulmonary irritation in such cases. From two to four drops may be given three times daily to a child under three years old.

CHAPTER XXVIII.

AROTITIS. MUMPS.

PAROTITIS is a specific inflammatory affection, particularly liable to be transferred to the testes in males and mammæ in females; propagated by a peculiar contagion, and occurring sometimes spasmodically.

Symptoms.—Slight febrile symptoms generally usher in the disease, which is first manifested by a feeling of stiffness about jaws, and a little tumor and pain in one or both parotid glands. The swelling in the beginning is moveable, but it soon becomes widely diffused, frequently involving the maxillary glands. It gradually increases until the fourth day, when the affected gland is very firm, tender and elastic to the touch. The skin over the tumor retains for the most part its natural hue, although in some instances it is changed to a pale red, and occasionally a bright red color. The maxillary glands, are sometimes more largely affected than the parotid. Mastication and deglutition are in all cases attended with considerable pain. The fever is in general mild, though the patient is frequently troubled with considerable restlessness and nervous irritability. The inflammation begins to decline about the fourth day, and very rarely tends to suppuration. The other inflammatory symptoms now likewise subside, and about the seventh day from the beginning of the disease, detumescence is complete. Diaphoresis, more or less general, and a red urinary deposition, usually accompany the subsidence of the affection.

Metastasis of the disease sometimes occurs upon the decline of the inflammatory symptoms. In females, the breasts, and in males, the testicles are apt to become hard, swollen and more or less painful to the touch. This symptom, according to some respectable writers, is rather favorable than otherwise; for sometimes where it has been absent, an exacerbation of the sympto-

matic fever has taken place, violent cerebral disturbance ensued, and death been the result. Dr. Hamilton relates several instances, in which, after considerable enlargement of the testicles, occurring upon the decline of the disease, this organ wasted entirely away, so that the tunica vaginialis became an empty sack. Improper exposure to cold, will sometimes cause a sudden transition of the affection to these parts, in which case, if the treatment be not judicious, suppuration may ensue—a very painful event and one that may terminate fatally. The same cause sometimes occasions a metastasis of the inflammation to the brain. Coma, or furious delirium now generally supervenes, and death usually follows in the course of a few hours. A case of this kind came under my notice, where in less than an hour, the patient expired in a paroxysm of convulsions. We must not forget that a metastasis of the disease to the mammæ or testes is no absolute security against a secondary translation of it to the brain.*

Children and young persons are most liable to the attacks of this complaint, its appearance in maturer life being very uncommon. It rarely affects the same individual more than once, resembling thus the other acute contagious diseases. Parotitis, occurring in advanced life, shows an aptitude at times to take on a chronic form, accompanied by very serious symptoms. This aptitude is most apt to occur in females in whom the menses are about ceasing, and whose general systems are in some measure deranged. Although suppuration is an uncommon termination in this complaint, it may yet under circumstances favoring it, take place.

With the exception just noted, Parotitis may be said to be neither a severe nor dangerous affection—particularly where the patient avoids exposure to low or variable temperature, and keeps the affected parts moderately and uniformly warm.

Treatment.—In mild cases, beside attending to the precautions just mentioned, little more is necessary than keeping the bowels open and using gentle diaphoretics. Sometimes the inflammatory symptoms run high, and we should then resort to

* See history of an Endemic Parotitis, &c. Edinburgh Med. and Surg. Journ. Vol. 4, p. 304.

active antiphlogistic measures. When the swelling disappears in the neck and shows itself in the testicles, blisters should be applied to the parotids, and every effort made to excite a general diaphoresis. A mild, cooling regimen is to be enjoined, and where the pain is extreme and the symptomatic fever severe, we must have recourse to full purging and sometimes to venesection. Emetics have occasionally been productive of much benefit in such cases. To discuss the hard tumefaction not unfrequently remaining after the disappearance of the inflammatory symptoms, frictions with mercurial ointment, spirits of camphor or rubefacient liniments should be used.

CHAPTER XXIX.

TONSILLITIS. CYNANCHE TONSILLARIS. QUINSY.

Inflammation of the tonsils and fauces, is a frequent complaint among children. It generally commences with a feeling of chilliness, accompanied with a huskiness of voice, an uneasy sensation in the fauces, and a stinging or cutting pain, in this part, on swallowing. More or less febrile reaction ensues; and in a few hours a fixed pain is experienced in the region of the tonsils, and the swallowing becomes more and more painful, until at last the action is productive of extreme anguish. On examination, one or both tonsils are found swollen, and the whole surface of the fauces present a tumid and florid aspect. In some instances, the uvula and soft palate, exhibit a highly œdematous and dark red appearance. The tongue is covered with a white fur, through which the florid and enlarged papillæ project; and over the whole, a thick layer of tough transparent slime is spread. In severe cases, the face becomes flushed and tumid; the carotids beat strongly; respiration is laborious, hearing obtuse, the pulse frequent, full, and hard, and the voice indistinct or whispering. In general, the patient swallows soft or pultaceous substances with more ease and less suffering, than liquids. Severe pains, usually dart from the fauces into the ears,—particularly when the patient attempts to speak or to swallow; and the mouth is opened with great difficulty and pain. The breathing is much obstructed by the extremely viscid mucus, which is so copiously secreted in the fauces; but in violent cases, the principal and most alarming source of difficult respiration is the enlargement of the tonsils; for when both are inflamed, they sometimes

become so much swollen, as to come in contact wtth each other, confining the uvula behind them, or pressing it forward into the mouth.

In some instances flakes of coagulable lymph of a whitish color adhere to the inflamed tonsils, resembling superficial sloughs. In cases of this kind, the inflammation is always of a vivid red color, and its tendency is either to resolution or suppuration. Occasionally, however, the inflammation assumes more of an erysipelatous character, the affected parts exhibiting a dark livid, and œdematous appearance, with small aphthous ulcers of white or grey color on the tonsils and uvula. Instances of this kind, very rarely terminate in suppuration.

Inflammation in this disease terminates in resolution or suppuration,—gangrene hardly ever occurring, although at times a few sloughy spots are visible in the fauces. In no structure is abscess more frequently the result of inflammatory action, than in the tonsils. Internal suppuration will often take place in a few days, despite of the most active local and general antiphlogistic measures. The quantity of matter formed in a suppurated tonsil is seldom abundant: it is not often very perceptible in the sputa, a portion of it undoubtedly being commonly swallowed with the saliva. Occasionally the abscess has pointed and broken outwardly, under the angle of the jaw. Dodonæus relates a case, in which the patient appeared near death, where prompt relief was procured by an external incision in the abscess, and the consequent discharge of a large quantity of pus.

This disease is never contagious, and though for the most part violent in its character, it is of short duration. In some instances, the inflammation passes down into the larynx, an occurrence that always increases the risk from the affection. Where this disease occurs in the same individual more than once, a predisposition to it is apt to be established. Frequent attacks tend also to occasion permanent enlargement and induration of the tonsils. In cold and variable climates, it is a complaint of frequent occurrence; and although by no means so dangerous as anginose affections of the respiratory passages, it is much more painful, in violent cases always alarming, and sometimes fatal. The young and the sanguine are said to be particularly liable to its attacks.

Some individuals are peculiarly predisposed to this disease. This, as before observed, is especially the case with persons, who have suffered once or twice from its invasion. But other causes such as the constitutional influence of mercury, salivation and a strumous habit of body, appear to create or constitute a predisposition to the complaint.

Cold and damp air, or cold applied in any manner, so as to give a sudden check to the perspiration, is the ordinary exciting cause; and hence the frequency of its occurrence in spring and autumn, when vicissitudes and variable temperatures are most common. Standing or sitting long on cold and damp ground is particularly apt to give rise to the complaint, in those who are predisposed to it.

Treatment.—The treatment of this affection must, of course, be strictly antiphlogistic; and, it is of much importance that efficient means be employed as soon as the disease is noticed; for, even where the onset of the disease is mild, we have no security that its course will not be marked with extreme violence. When the pulse is full and active, blood ought to be promptly and efficiently drawn. In children, however, the febrile reaction is not often so vehement in the commencement of the disease, as to require a copious abstraction of blood; and in mild cases the inflammation may often be speedily subdued, with counter-irritating applications, purgatives, warm pediluvium, &c., without the aid of direct depletion. Nevertheless, blood-letting, when regulated according to the state of the pulse, is always a safe and useful measure, and should never be omitted when the symptoms do not readily yield to other appropriate means.

Purgatives are highly beneficial remedies in this affection. An active purge should be administered in the commencement of the treatment, and repeated daily, until the inflammation is subdued, or has terminated in suppuration. For this purpose we may use five or six grains of calomel, followed in an hour or two by a suitable dose of epsom salts. I have known prompt and decided relief obtained from the use of the following emeto-cathartic mixture, given in doses of from a dessert to a table spoonful every hour, according to the age of the patient, until

vomiting and purging was produced.* Diaphoretics, also, are useful auxiliaries, in the treatment of this affection. Nitre, in union with antimony, forms an excellent remedy for this purpose. Some advantage may be gained by causing the patient to place the nitre on his tongue, and swallow it as it is gradually dissolved in the mouth. Much benefit may in general be derived from nauseating doses of tartar emetic. Of two ounces of water, holding a grain of tart. antim. in solution, a teaspoonful is to be taken every thirty minutes, so as to keep up a considerable degree of nausea for several hours. I have frequently prescribed the medicine in this way with the happiest results. The muriate of ammonia, dissolved in water, with the extract of liquorice, has been particularly recommended. †

Emetics were once a good deal employed in tonsillitis, but their effects are much less beneficial in this, than in any of the other anginose affections. In infants, however, they are often highly beneficial, by removing the extremely viscid mucus which adheres to the palate, tonsils and fauces, and obstructs respiration.

Topical bleeding, by scarifying the tonsils, generally produces excellent effects. Kopp thinks, that blood drawn in this way from the tonsils, is the most certain, prompt and efficacious remedial measure we possess. The early application of leeches to the throat or under the ear, although of less value, perhaps, than scarification, should by no means be neglected. Cupping on the back of the neck and under the ears, may, also, be resorted to with advantage.

So soon as the momentum of the circulation has been reduced by venesection, a blister should be applied to the throat, or on the back of the neck. In slight cases of the disease, rubefacients, particularly the spirits of turpentine, or a liniment composed of two parts of aq. ammoniæ to one of sweet oil, will in general suffice. Emollient poultices are also very useful applications in mild cases. Employed in the commencement of the disease, together with warm pediluvium and a purgative, the further progress of the inflammation, will sometimes be speedily and effectu-

* ℞ Sulph. magnesiæ, ... ℥ss.
Aq. fontanæ, ... ℥viii.
Tart. antimonii, ... gr. i.

† Leoffler. Beitaegen Zur Arzn. Wissensch. I. Th. Leips. 1791, p. 142.

ally arrested. Three or four folds of thick flannel round the neck, in such instances, with the auxiliaries just mentioned, are often sufficient to prevent the developement of the malady. But in every case where inflammation is considerable, immediate recourse must be had to vesication.

The early use of astringent and acid gargles has been much recommended. Cullen advises a decoction of oak bark, with alum dissolved in it, as a useful prescription for this purpose. For myself, I generally prefer simple warm water, acidulated with vinegar. The principal advantage of gargles in this complaint would seem to be that of dissolving and removing the viscid mucus, adherent to the tonsils and palate; and this is best accomplished by warm water, either alone, or with a portion of some vegetable acid, and perhaps honey. Pringle says, that he never derived any benefit from astringent gargles, and according to Storch, they have at times been evidently injurious, by checking the exhalation and secretion from the mucous surface of the inflamed parts.

The inhalation of certain vapors by any simple machine, is one of the oldest remedies in this affection. The vapor of vinegar and water was used by Hippocrates.

If it is obvious that suppuration cannot be prevented, every proper measure should be taken to facilitate this termination. The steam of warm water, or of water impregnated with rosemary or chamomile leaves, should be inhaled, and astringent gargles should at once be discontinued. When the fluctuation and other symptoms indicate the formation of a tonsillar abscess, it should by all means be immediately pierced with a lancet; as the discharge of the matter will always give instant relief from the pain and difficulty of respiration. After the operation, the patient should continue for a little while, the use of some mild and slightly acidulated or astringent gargle.

Occasionally, from the extent and violence of the inflammation in tonsillitis, there has been so much danger of suffocation, that it has been found necessary to make an opening into the trachea; which has been done sometimes as high as the larynx, and sometimes considerably lower; and under both kinds of operation the patient has recovered. (Good.)

CHAPTER XXX.

CYNANCHE TRACHEALIS. TRACHEITIS. CROUP.

Cynanche trachealis may be defined: an inflammation in the glottis, larynx and upper part of the trachea, attended with a hoarse and ringing cough, sonorous respiration, and a sense of impending suffocation.

This form of cynanche does not appear to have been generally known as a distinct disease, until Home described it in a work published at Edinburg in 1765. It is not at all likely, however, that the disease is one of modern date, since its ordinary causes have always existed, and it cannot be presumed, that at any period of the world, their influence could have been materially different from what it is at the present day. The disease was confounded, no doubt, with other anginose affections, to some of which it bears, indeed, a very close resemblance in many of its prominent phenomena.

In the long list of human diseases, there is none which presents a more painful scene of anguish and distress, or which excites more poignant feelings of sympathy in the heart of the physician, than the one now under consideration. I have witnessed the approach of death under a multitude of appalling forms; but in all the death-bed scenes which it has been my misfortune to witness, I have never had my feelings so deeply afflicted as when looking on a blooming child struggling under the ruthless grasp of this terrible disease. In some instances this disease comes on suddenly, and in a very short time acquires the utmost degree of violence. More frequently, however, it is gradually developed—a dry and hoarse cough, attended with slight difficulty of breathing, roughness of voice, and some degree of languor or lassitude, being the first intimations of its approach. These symptoms sometimes continue for several days, before the disease is fully developed.

Sooner or later, however, the breathing becomes more difficult, the febrile irritation more obvious, the voice more indistinct and whispering, and the cough more hoarse and sonorous. There is something so peculiar in this hoarsness--such a rough, ringing, and dry sound in the cough, as can never be mistaken by those who have once heard it—and whoever has once heard it in connection with the distressing symptoms which characterize the disease in its state of full development, can never hear this croupy cough, without the most anxious apprehensions. The disease now advances rapidly, and in a short time, acquires the most alarming and distressing degree of violence. The countenance is flushed; the eyes prominent, injected and heavy; the pulse frequent, tense, and quick; the skin dry and hot; and the respiration extremely laborious and anxious. In the commencement of the disease the cough is often quite dry; but in the majority of cases, a very viscid and thick mucus is secreted by the mucous membrane of the fauces and larynx from its very on-set, and which from its spissidity contributes greatly to increase the difficulty of breathing. The sound attending the respiration, especially the act of inspiration, is at first ringing and rather clear; but in the advanced period of the disease, it is characterized by a peculiar *wheezing*, as if the air were forcibly driven through a very narrow aperture. The act of inspiration is always performed with much more difficulty, and occupies a much longer time than the expiration of the air. This latter act is, comparatively, quick and always unaccompanied with the shrill and wheezing sound which attends inspiration. In the advanced periods of the disease, the cough is in all instances attended with a rattling sound, and the expulsion of extremely tenacious mucus from the trachea.

If the progress of the disease be not checked, the difficulty of breathing increases progressively, until, at last, the oppression becomes inexpressibly distressing. The countenance and motions of the little patient indicate the utmost degree of anguish and suffering. The head is thrown backwards, and the mouth kept open to facilitate respiration; the face is of a pale livid hue, the eyes are prominent and half closed; the lips purple, the muscles of the face agitated with the respiratory effort; large drops of sweat

hang on the temples and upper lip; the extremities become cold and clammy; partial insensibility ensues; the breathing becomes feeble and interrupted, and the patient finally sinks into a state of total insensibility, which soon puts a termination to the agonizing struggle.

Such are the ordinary course and symptoms of this dangerous affection. Much diversity, however, occurs, in relation to the degree of violence and rapidity of these phenomena. In some instances, the disease proceeds very slowly, the child being troubled during the day with some difficulty of breathing and a hoarse and dry cough, while at night an alarming paroxysm of croup will occur, and continue until towards morning. In this way, the disease will sometimes go on for five or six days; the patient being so free from any difficulty of breathing during the day, as to induce a belief that the disease has been subdued. At night, however, another attack will, perhaps, occur, and continue, with unceasing violence, and in opposition, often, to all our remedial efforts, until it terminates in death. Occasionally the disease is very gradually developed, and continued for nine or ten days, without at any time acquiring a very alarming degree of violence. In cases of this kind the patient is harassed with a very hoarse cough, and considerable difficulty of breathing, with occasional severe exacerbations of the croupy symptoms, both during the day and at night. There is generally a pretty copious secretion of mucus in the trachea in such cases, and the respiration is usually constantly attended with a rattling sound in the chest. These protracted and remitting cases of croup are most apt to occur during difficult dentition.

It would seem, that in some instances, the predisposition to this disease is congenital; for it is well known, that the children of some families are peculiarly predisposed to this complaint, whilst in other families, it never makes its appearance. It is manifest, also, that there is something peculiar to infancy and childhood, which increases the liability to this affection; for its occurrence is vastly more common between the first and fifth year of age, than in the whole subsequent period of life. This aptitude to the disease during early childhood, has been ascribed to the peculiar condition of the glottis and larynx, at this age;

for the existence of some peculiarity in this portion of the respiratory passages during infancy and childhood, unconnected, probably, with mere size of aperture, may be inferred from the characteristic voice at this early period, and its remarkable change at the age of puberty. There is another circumstance, however, which may have a share in creating the aptitude in question, and which has reference to the exciting cause of the disease. The almost univeral mode of clothing infants—with their necks and upper part of the breast bare, cannot fail to render them more subject to the influence of cold, and the consequences of this cause, in the parts thus exposed. It is a fact, which has been forcibly pressed on my attention, that in the country—especially among the Germans, who are in the habit of clothing their children in such a manner as to leave no part of the breast and lower portion of the neck exposed, cynanche trachealis is an exceedingly rare disease. Whereas, in cities, or among people who adopt the modes of dress common in cities, this frightful disease is, in proportion to the population, vastly more frequent. During a practice of six years among this class of people, I recollect of having met with but a single case of this affection, and this case occurred in a family, who had adopted the present universal mode of suffering the necks and superior portions of the breasts to remain uncovered. Certain exanthematous affections, also, sometimes give rise to an increased aptitude for this disease. This is especially the case with scarlatina, measles, and miliary fever. Children of robust and full habits, appear to be much more liable to the disease than those who are feeble, relaxed, and sickly.

Cold and sudden vicissitudes of atmospheric temperature, constitute the principal exciting causes of this disease; and hence its more frequent occurrence during the variable damp and cold months of autumn and spring, than in the more temperate and uniform season of summer. Sitting or lying down on a damp grass plat, or in a current of air after the body has been over-heated by exercise in the sun, is particularly apt to bring on an attack of this complaint. It has been observed also, that in situations naturally abounding in moisture, cynanche trachealis is a much more common disease, than in localities of an opposite

character. Under the head of occasional causes may be noticed also, the habit to which I have already adverted; namely, that of suffering the necks and upper part of the breasts of children to remain freely exposed to the air. I have more than once known this disease produced, by children throwing off the bed coverings at night, when asleep and in a state of free perspiration from the warmth of the bed. In general this disease is most apt to occur soon after, or during the prevalence of epidemic, catarrh, measles or scarlatina. During convalescence from the two latter of these affections, there exists, often, an especial aptitude to cynanche from the influence of cold. It would seem, also, that the predisposition to this disease is much increased by having suffered an attack of it; I have known the same individual, suffer five or six attacks of this disease during the period of childhood.

Cynanche trachealis, is a *phlegmasial* affection, consisting essentially, of inflammation of the mucous membrane of the superior portion of the respiratory tube. The correctness of this pathology is confirmed, not only by the known character of its most common exciting cause, but especially, also, by the more direct evidence of the symptoms of the disease, and the appearances on post-mortem examination. Unequivocal signs of previous inflammation are invariably discovered in the larynx and trachea on dissection. It is indeed surprising, that this disease should still be viewed by some of the German and French pathologists, as essentially spasmodic in its nature, and wholly independent either of a general or local inflammatory condition. Several of the late continental writers on this disease, regard the fever and inflammation, which they acknowledge sometimes to exist, as wholly accidental, and as in no manner essential to the perfect constitution of the malady. Professor Nasse regards impaired or disordered functions of the pneumo-gastric nerves, as the proximate cause of this disease. The characteristic symptoms of the disease, he asserts, bear a strong resemblance to those which result from the division of the eighth pair of nerves. The inflammation which occurs in the mucous membrane of the trachea, is, according to his view, secondary, and a consequence of the disordered function of the pneumo-gastric nerves.

There are two varieties of inflammatory croup. In one the inflammation commences in the fauces, and afterwards descends into the larynx and trachea. In cases of this kind, the breathing is, at first, but little affected, but the cough has a peculiarly rough and hoarse sound. On inspecting the fauces, the tonsils, uvula and palate present a swollen and dark red appearance; and the child always complains of considerable difficulty and pain in swallowing. In the other, and most common variety of the complaint, the inflammation commences in the larynx or trachea, the fauces remaining entirely free from redness and swelling. The patient experiences no pain in swallowing, and the respiration is much oppressed from the commencement of the disease. The former variety is, generally, much slower in its progress than the latter,—the hoarse cough and occasional spells of difficult breathing, continuing sometimes for four or five days, before the symptoms acquire a very alarming degree of violence.

The inflammation which occasions the characteristic phenomena of the disease, does not always remain confined to the larynx and trachea. In some instances it extends downwards into the bronchia, and sometimes even into the smallest ramifications. This extension of the inflammation is always attended with the utmost degree of danger; and when it passes down into the extreme bronchial tubes, the result, indeed, must almost inevitably be fatal. In cases of this kind death usually takes place from effusion into the air cells.

In many instances the viscid albumenoid fluid, which is so copiously secreted by the inflamed lining membrane of the larynx and trachea, concretes, over the internal surface of these passages into a sort of membrane; and to this membraneous substance many of the latter and fatal phenomena of the disease are usually ascribed. It must not be supposed, however, that such a pseudo-membrane is formed in all fatal cases; nay, it is quite certain, that it does not occur, even in the majority of cases.

In other instances, the inflammation instead of giving rise to a concrete membraneous substance, terminates in the secretion of a muco-purulent fluid, of an opake and yellowish appearance. There are other cases again, and these are probably, the most common, in which the inflammation produces neither false mem-

brane nor a puruloid matter, but an extremely copious secretion of a very viscid, transparent and frothy mucus. Blaud thinks that these different modes of termination, constitute good grounds for dividing the disease into three principle varieties, indicating three different grades of inflammation. It is not improbable indeed, that the inflammation is at its highest grade of violence in those cases which are attended with the formation of a false membrane. It would appear to be less intense, when, instead of this coagulable exsudation, there is only a muco-purulent secretion formed; and where the secretion consists, simply of tough, transparent and frothy mucus, the inflammation is doubtless at its lowest grade. In the first and most aggravated variety of the disease, the cough and respiration are dry or free from that peculiar rattling sound in the respiratory passages, which occurs when these contain viscid secretions. In cases of this kind, the patient generally experiences considerable pain in the larynx, and the fever is usually very strong. The period at which the false membrane is formed, after the commencement of the inflammation, appears to vary considerably. M. Blaud states that he has found the larynx and trachea lined with pseudo-membraneous matter, in cases whose whole course did not occupy more than twenty hours; whilst in other instances several days appeared to elapse before it was formed. Occasionally only a part of the internal surface of larynx is found lined with this concretion; but in some cases it extends down into the bronchia, and even into the smaller ramifications. Sometimes instead of a membraneous expansion, the upper part of the trachea is found almost entirely blocked up with a thick mass of concreted albumenoid secretion; and this is generally located just within the glottis. I have seen an instance of this kind, in which the opening left through this concreted mass would hardly admit a crow's quill.

When the cough and respiration become humid or rattling, as soon as the inflammation is developed, we may infer that there will be no membraneous concretion formed. Mr. Blaud thinks, that the viscid mucus which is so copiously secreted in these milder cases, is entirely different in its properties, from the secretion which occurs in the former variety—and that it is incapable of being so inspissated as to give rise to a membra-

neous concrete. In these cases, the mucus in the larynx and trachea is often so abundant, as to threaten suffocation by obstructing the glottis.

Whatever may be thought of M. Blaud's division of this disease, or of his sentiments in relation to the *radical* distinction between the inflammation and secretion which give rise to *membraneous* structures, and that inflammation and its consequent *mucous* secretion which occurs in cases unattended with the formation of false membrane, it must be admitted that there exists at least a two fold diversity in relation to the immediate local consequences of the laryngo-tracheal inflammation—namely, one variety in which false membrane is formed, and in which the cough and respiration are at first dry, or do not indicate the existence of much mucus in the respiratory passages; and another variety in which the cough and respiration are humid, in the early period as well as throughout the disease, and in which a very copious secretion of transparent and extremely viscid mucus occurs. The former are exceedingly dangerous, nay, almost hopeless, unless subdued by the most prompt and powerful antiphlogistic measures in their very onset. The latter are much less dangerous, and may generally be cured by more moderate antiphlogistic measures, and the expulsion from time to time of the tenacious mucus from the larynx and trachea. In nearly all cases the mucous membrane of the larynx and trachea is found very conspicuously injected on dissection; and in those who die under the conjoined symptoms of bronchitis and tracheitis, traces of inflammation present themselves, throughout the whole extent of the bronchial ramifications, and in some instances, the substance of the lungs is infiltrated with serum, and the air cells are choked up with viscid mucus. In the majority of cases, the glottis is narrowed by a kind of thickening or tumefaction of its lips.

Considerable diversity of opinion has been expressed as to the immediate cause of the distressing difficulty of breathing and of death in this disease. In relation to the latter, it is manifest, that an impediment to the intromission of atmospheric air into the lungs, is the immediate cause of death, and that, therefore, death occurs in this disease, from asphyxia. The circum-

stances which cause the exclusion of the air from the lungs, consist either in a spasmodic closure of the glottis, or in an occlusion of this aperture by tumefaction of its sides, or by the formation of false membrane or a mass of concreted lymph, or finally by an excessive quantity of a very ropy and viscid mucus closing up the passage. Death is also sometimes the immediate consequence of an effusion into, and consequent choking up of the bronchial cells, a mode of termination which almost always occurs when the inflammation descends into the bronchial ramifications.

Spasmodic contractions of the glottis may be excited by the irritation of the concreted membraneous lymph, immediately within this aperture. It is a remarkable circumstance that the difficulty of drawing the air *into* the lungs is always much greater, and attended with much more sound than that which accompanies expiration or the act of throwing the air out from the lungs. This cannot be explained, as some have attempted, by supposing that the portion of the false membrane nearest the glottis becomes separated from the sides of the trachea, and that, consequently, more difficulty and noise is produced during inspiration, on account of a portion of the inspired current of air being forced in between the detached membrane and the surface of the larynx, whereby the ingress of the external air is impeded; whilst in the act of expiring the air, the detached extremity of the membrane would be pressed outwards against the sides of the treachea, and offer, therefore no particular impediment to the outward current of air.

That such consequences might follow the separation of the superior portion of the membrane, immediately within the glottis, cannot be doubted; but when it is observed that the same relative increased difficulty of the *inspiration* is present, in all instances, from the very commencement of the disease, and before any membraneous concretions can be formed, we are forced to admit that, the circumstance in question, depends on some other morbid condition of the parts, implicated in the disease.

The solution of this problem must I think be sought for in the altered sensibility of the glottis and trachea, in consequence of which the contact of the atmospheric air, produces an irritation

which excites spasmodic contraction in the *glottis*. It is well known how greatly the vital properties are altered by inflammation. In drawing the external air into the trachea, it irritates the mucous membrane, and excites the glottis to contraction, by which the ingress of the air is retarded, and the difficulty in question produced. This is entirely analogous to what occurs in other organs when in a state of inflammation, from the impression of their appropriate stimuli. Thus light to a healthy eye, is any thing but disagreeable; yet when this organ is inflamed, even a moderate degree of light, gives rise to pain, and an involuntary contraction, or closing of the eye-lids. When the urethra or the neck of the bladder is inflamed, the contact of the urine often excites so much spasm of this canal, as to prevent the discharge of this secretion altogether. In a similar manner therefore, we may conceive, is the increased difficulty of *inspiration* produced in this affection. I wish to be understood, however as referring here only to the comparative difference of the acts of *inspiration* and *expiration*, for the dyspnœa taken as a general symptom, is undoubtedly mainly dependent on the circumstances already mentioned—namely, tumefaction—viscid mucus adhering to the glottis, and in the advanced stages concreted pseudo-membraneous substances diminishing the calibre of the respiratory tubes; and finally effused lymph or mucus into the bronchial cells. During *expiration*, the air ceases to irritate the glottis in consequence of its more elevated temperature, which is now on a level with that of the inflamed organ; and probably also, in a degree, in consequence of the carbonic acid which it contains and which is well known to be a very considerable sedative to irritable parts.

Prognosis.—Cynanche trachealis is always to be regarded as a very dangerous affection. Formerly the majority of cases terminated fatally; but under the present improved pathology and mode of treatment the mortality from this disease is greatly diminished. When early attended to, this complaint is, indeed, as much under the control of vigorous antiphlogistic measures, as any of the more serious phlegmasial affections. In general, the obstinacy and dangerousness of the disease, is proportionate to

the intensity of the inflammation, and the extent to which it passes downwards into the lungs. When the fever and croupy symptoms come on suddenly, the danger is, usually, much greater, than where the disease is slowly developed. A sudden attack *without fever*, however, is not, in general, attended with peculiar danger; for in this case, the affection is, probably, purely *spasmodic*—a form of croup much more manageable than inflammatory or febrile cynanche. The shriller and more sonorous the cough is, the more reason is there to apprehend danger. The prognosis in this affection is, often, extremely uncertain. Sometimes, when the symptoms appear to be in a great degree subdued, and every thing promises a speedy recovery, a violent exacerbation will suddenly supervene, and destroy the patient. On the other hand, death may appear to be impending, when, on the sudden expulsion of a membrane, or even without such an occurrence, a rapid change for the better will ensue, and lead on to full convalescence.

Diagnosis.—There is a disease which, in most of its prominent symptoms, bears so close a resemblance to *tracheitis*, that many have been induced to regard it as the same affection, or at most as only a modification of the disease now under consideration. I allude to the *acute asthma* of Miller, or the disease which by some pathologists is denominated, and with perfect propriety, *spasmodic croup*. Although attended with the same extreme difficulty of breathing and sense of impending suffocation which belong to inflammatory croup, spasmodic croup is essentially distinct in its pathological character from the former disease, and of course requires a mode of treatment correspondingly modified. An attention to the following circumstances will enable us to distinguish these two forms of croup from each other.

1. The approach of *cynanche trachealis* is generally gradual, and preceded by the usual train of precursory symptoms, which usher in catarrhal affections. *Spasmodic croup*, on the contrary, almost always comes on suddenly, and is rarely preceded by the ordinary premonitory symptoms of catarrh. It is true, indeed, that in some instances, cynanche trachealis also, supervenes quite suddenly; but when this is the case, it is always so manifestly of an inflammatory character, and is attended with so much fever, that

there can be no difficulty in distinguishing it from the spasmodic variety of the disease.

2. Cynanche trachealis is essentially a febrile disease—the phenomena of fever being never absent. Spasmodic croup, on the contrary, is entirely free from fever, except it be present, as an accidental occurrence. In the former, the urine is almost, invariably, high-colored and scanty: whereas, in the latter affection, it is usually pale, watery and often copious.

3. Cynanche trachealis is often attended with considerable *remissions;* but these are generally of very short duration and incomplete. Entire *intermissions*, except immediately after vomiting, or on the approach of syncope from bleeding, never occur. In spasmodic croup, the intermissions are often complete and protracted; and this circumstance, perhaps more than any other, characterizes this form of croup.

4. Cynanche is always attended with a peculiar hoarse and sonorous cough, and frequently with a copious secretion of viscid mucus in the trachea. Spasmodic croup is rarely associated with much cough, often none at all, and it is always dry.

5. The peculiar ringing sound of the cough and inspiration, so characteristic of cynanche trachealis, does not occur in the spasmodic form of the disease.

6. In cynanche trachealis the pulse is generally frequent, full, quick and tense, and the skin is hot, except towards the fatal termination of the disease, when from the imperfect performance of the respiratory function, animal heat ceases to be generated with due rapidity, in consequence of which the extremities and surface generally, became cool or cold. In spasmodic croup, on the other hand, the pulse is small, very frequent and feeble, and the skin not above the natural temperature.

Dr. Rush has given an account of a post-mortem examination of a child, that had died of spasmodic croup. In this subject, no membrane, nor even any unusual quantity of mucus, was found in the respiratory passages; and the trachea as well as the lungs exhibited a perfectly healthy appearance. It is, indeed, sufficiently ascertained, that cases of a purely spasmodic character occur, which in the extreme difficulty of breathing and other phenomena, bear a strong resemblance to cynanche trachealis. This form of

the disease is evidently of the nature of spasmodic asthma, and appears to depend on *cerebral* or *dental* irritation, by which the functions of the respiratory nerves are thrown into disorder.

Treatment.—The principal objects to be kept in view, in the treatment of this affection, are: to subdue the local and general inflammatory irritation; and to promote the discharge of the viscid and concrescible secretions, which are lodged within the superior portions of the respiratory tube. Fortunately the remedies which are found most efficient, in the accomplishment of the latter object, are also among the most useful auxiliaries for the reduction of the febrile excitement and local inflammation. Without doubt, however, the remedy upon which our principal reliance should be placed, for the removal of the tracheal inflammation is *blood-letting*. In the whole catalogue of inflammatory affections, there is no disease, in which bleeding when promptly and efficiently practised, is more likely to prove beneficial, than in the one now under consideration. He who, in violent cases, neglects this important measure, and places his hopes on one or more of the empirical remedies, that have, by different practitioners, been extolled for their supposed specific tendency to counteract the tracheal affection, will, we may be assured have but little reason to flatter himself for his success in the management of this malady. Here, however, as in most of the other phlegmasial diseases, the beneficial effects of bleeding, are limited to the early period of the complaint. If bleeding be neglected, or inefficiently employed in the *first* stage of the malady, its progress will be extremely perilous, whatever other remedial measures may be adopted. When called to a patient labouring under a severe attack of this disease, a vein should be immediately opened, and the blood suffered to flow until a very decided impression is made on the pulse, or until an approach to syncope is induced. When blood is thus efficiently drawn, all the distressing symptoms usually subside for a time; and in some instances this first blow at the disease, subdues its strength so far, as to prevent it from afterwards recovering any alarming degree of violence. More frequently, however, the fever and difficulty of breathing, rise again in the course of an hour or two, and when this happens, and the pulse

be not soft and weak, more blood should be drawn, and again to the extent of producing a very obvious impression on the circulation and general system. I have been obliged to open a vein three or four times in the course of the first twelve hours, before a permanent and decisive impression was made on the febrile and inflammatory symptoms. My usual mode of bleeding in this disease, is to have the patient supported in a sitting posture, with his feet immersed in warm water, whilst a vein is opened in the arm. In this way syncope will be induced much more readily, than when the patient remains in a recumbent posture during the operation. Nothing tends so powerfully and promptly to arrest the progress of inflammation as partial syncope induced by blood-letting. During this state the momentum of the circulation is greatly diminished, and a general relaxation of the cutaneous exhalents ensues; effects which have a direct and powerful influence, in reducing the inflammatory condition of the system.

Such copious depletion is, however, demanded only in cases where the local and general inflammatory action is strong; where the pulse is active, firm, quick or tense, attended with a dry and sonorous cough and respiration. Cases of this kind, are apt to terminate in the formation of pseudo-membraneous concretions in the larynx, and our efforts ought to be prompt and vigorous to reduce the inflammation below the grade necessary for the formation of false membrane. After the effusion which gives rise to these concretions has taken place, bleeding will afford but very little or no advantage. Where the febrile symptoms are moderate, and the pulse is free from tension and hardness, and especially where in connection with moderate febrile irritation, the *cough and respiration are accompanied with a copious transparent, and viscid mucus*, blood-letting need very rarely be carried to the extent that has just been mentioned; and may even, in mild instances, be wholly dispensed with.

Next in importance to prompt and decisive blood-letting are *emetics*. They are, indeed, altogether indispensable in managing this formidable malady, and, when assisted by warm pediluvium, rubefacients to the throat, and mercurial purgatives, they will often subdue mild attacks of the disease, without the aid of direct depletion. When the febrile excitement is strong, however, and

the breathing is very difficult, with a turgid and flushed appearance of the face, it would be highly imprudent to rely on emetics and their usual auxiliary remedies, without prompt and decisive venesection. Nevertheless, even where bleeding may be regarded as our main stay, emetics are highly useful, and ought always to be employed concomitantly with venesection. They are especially beneficial when the disease is early attended with a copious secretion of viscid mucus in the larynx and trachea. Much of the difficulty of breathing in cases of this kind, depends on this viscid secretion, obstructing the entrance of the air into the lungs. The occasional expulsion of this glutinous fluid from the trachea, by the operation of an emetic, not only greatly relieves the distressing difficulty of breathing and sense of suffocation, but contributes also to obviate the formation of false membrane, by preventing the accumulation and removal of the coagulable secretion in the trachea. They tend moreover, to equalize the circulation and to promote the cutaneous exhalation, as well as to diminish the general arterial excitement by the nausea which precedes and accompanies their operation. When the cough and respiration *are dry*, as they commonly are, during the first stage of highly inflammatory cases, we seldom derive decided advantage from the operation of an emetic, so long as this dryness of the larynx and trachea continues. In such cases the proper period for administering emetics, commences with the appearance of the viscid secretions in the respiratory passages. Without doubt, from the general antiphlogistic tendency of nausea and emesis, some benefit may result from the employment of emetics, before any morbid secretions occur in the trachea; but the peculiar usefulness of this class of remedies, is always most conspicuously displayed when the upper portion of the wind pipe is clogged with viscid mucus.

In the commencement of the disease, there seldom exists any difficulty in procuring free vomiting; but after the disease has continued for some time, or even in the beginning when the respiration is extremely oppressed, there exists, often, so much insensibility of the stomach, in consequence of the imperfect decarbonization of the blood, and the sanguineous congestion in the brain, that great difficulty is experienced in procuring the opera-

ion of emetics. To remove this gastric torpor and procure vomiting, we must endeavour to diminish the congestion in the brain; and this may, in general, be readily accomplished, by putting the patient's feet in warm water, and applying a napkin wet with cold water, to the head. The abstraction of blood, also, while the patient is supported in a sitting or erect posture, rarely fails to restore the sensibility of the stomach and to ensure the prompt operation of emetics.

The articles I prefer, as an emetic in this disease, are calomel in union with tartar emetic. I commonly administer from five to six grains of the former article with one fourth of a grain of the latter, to a child of two to five years old. This may be repeated every fifteen minutes until vomiting is excited. I have frequently given from eight to ten grains of calomel alone, and have generally found it to excite active vomiting in a very short time. The peculiar advantages, which appear to me to attend this practice, are the protracted nausea, which the calomel produces, an effect which has a powerful antiphlogistic tendency; and the alvine evacuations which almost always speedily ensue. Besides these effects, benefit may also be expected from the early constitutional influence of the calomel—an influence which in the present disease especially is very generally acknowledged to be highly salutary. Tartar emetic, ipecacuanna, sulphate of zinc, squills, and the sulphate of copper, have all been used and recommended in this affection; and where the object is merely to procure the expulsion of the tracheal mucus, or perhaps pseudo-membraneous matter, any of these articles may answer our purpose. I have in some cases administered the lobelia inflata with a view to its emetic operation with the happiest effect. From its well known powerful influence on the respiratory functions in asthma, independent of its emetic effects, there is reason for presuming that, in relation to the present disease, it may possess peculiar virtues, and my limited experience with it, inclines me to this opinion. When the stomach is very torpid, and there is urgent necessity for procuring the immediate expulsion of the viscid secretions from the trachea, the *sulphate of zinc*, will in general answer better than any other article of this kind. The following mixture is strongly recommended by M. Jadelot as an

emetic, in this affection.* In mild cases, a mixture of two parts of the syrup of squills, and one part of antimonial wine, given in tea spoonful doses every fifteen minutes, until vomiting is produced, frequently procures speedy relief. The common hive syrup of the shops, is also an excellent preparation for this purpose. In some instances when the accumulation of the viscid secretions is very rapid, it becomes necessary to repeat the emetic three, four or five times in the course of twenty four hours.

Purgatives are useful auxiliary remedies in the treatment of the disease. In the commencement of the treatment the bowels should be freely evacuated, by an active purgative. After this has been effected, it will be best to employ the gentlest articles of this class of remedies, so as to procure two or three evacuations daily, until the inflammation is subdued. Very active purging throughout the course of the disease, tends to exhaust the powers of the system, without affording any peculiar benefit, over milder aperients. After the first cathartic, it will in general be sufficient to keep the bowels in a loose state by laxative enemata.

Calomel, given with a view to its constitutional influence, has been generally regarded as a highly valuable remedy in this affection. The late Dr. Rush placed great reliance on its powers in croup. When given in large doses in the commencement of the disease and continued afterwards in small doses, "the Peruvian Bark," he affirms, "is hardly a more certain remedy in intermittents than calomel in croup." Dr. Hosack, also speaks very favorably of the employment of this article in conjunction with James' powder, given at short intervals, during the second stage of the complaint; and the late Dr. Bard placed much reliance on its powers. That the constitutional influence of mercury is calculated to do good in cynanche trachealis, I am well persuaded from my own experience. It tends to reduce the

* ℞. Infus. polygalæ Seneg. ℥iv.
Syrup. Ipecac. . . . ℥i.
Oxymil. Scillæ . . ℥iii.
Antimon. Tart. . . gr. ss.
M. Take a table spoonful every 15 minutes until vomiting is excited.

local laryngo-tracheal inflammation, and to counteract, as it would appear, the formation of the pseudo-membraneous concretion. In the more acute and rapid cases, however, many of which run to a fatal termination in less than twenty four hours, the constitutional operation of this remedy is much too slow to afford any particular advantages. Where on the contrary the disease is protracted in its course, or assumes somewhat of a chronic character, great benefit may unquestionably be derived from this potent remedy. My usual mode of giving calomel, after the first or second emetic, is to exhibit one grain every hour or two, with about one fourth of a grain of ipecacuanna.

Among the remedies that may be usefully employed for the reduction of the tracheal inflammation, the *warm bath* deserves to be particularly mentioned. Used along with the remedies already mentioned, its benefits are often considerable, more especially when the skin is very dry and harsh. It is to be observed, however, that its usefulness is, in a great measure, confined to the early period of the disease; for in the advanced stages of violent or unsubdued cases, the pulse is not only weak and very frequent, but the surface is generally bathed with a profuse and cold perspiration. Under these circumstances, no advantage but rather injury, would result from the relaxing influence of the warm bath.

Rubefacients and blisters are important remedies in the treatment of this affection. As soon as blood has been drawn, some irritating liniment, or a blister, ought to be applied to the throat of the patient. In general, the spirits of turpentine answer better for this purpose than any other rubefacient we possess. Its action on the skin is very prompt and powerful; and if the derivative powers of such applications be proportionate to the degree of irritation and pain they produce, few articles can equal the present one in this respect. A piece of flannel may be imbued with the turpentine and applied round the neck. Children seldom bear this application more than twenty or thirty minutes at a time. It should therefore be removed and reapplied, from time to time, according to the violence and permanency of its effects upon the skin. The oil of the *monarda punctata*, with an equal proportion

of camphorated liniment, forms, also, an excellent rubefacient in this affection.

Judging from my own experience, I am induced to prefer the employment of rubefacients to that of epispastics. The former have always appeared to me to do as much good as the latter, and they possess the great advantage of acting with great promptitude—a circumstance of no small consideration in a disease which often runs its fatal course in a few hours. A blister requires four or five hours before its effects on the skin can be of any particular avail; whereas the impressions of some of the essential oils are almost instantaneous. Nevertheless, where the disease proceeds slowly, blistering will be highly beneficial, and should not be neglected.

Local bleeding, by leeching, does not appear to make obvious impression on the tracheal inflammation; and it is now seldom if ever resorted to, except where the disease is attended with inflammation and swelling with the tonsils and palate. In one instance, in a child about six years old, I have known cupping on the back of the neck to procure manifest relief; but this case, was associated with conspicuous inflammation in the fauces.

Formerly, the root of the *polygala senega* was held in high estimation as a remedy in this disease; and it is unquestionably a very useful medicine in certain states of the disease, although, most assuredly, far from possessing the powers which were at first ascribed to it by Archer and others. In the commencement of the complaint—more especially in violent cases, this article is objectionable on account of its stimulating properties; but after the general and local inflammatory irritation has been to a considerable degree subdued, or the disease has lost its acute character, or assumed a chronic form, it is often highly beneficial. When a dry and hoarse cough, with slight difficulty of breathing remains, after the inflammation has been subdued, the polygala will in general prove more useful than any other remedy we possess. In all chronic croupy affections, and in the catarrhal sequela of this and other accute affections of the respiratory organs, it is a remedy of very excellent powers. It should be given in decoction. An ounce of the root to a pint of boiling water, simmered down to about three gills and sweetened with honey forms a suitable

preparation. From one to two or three tea spoonfuls of this decoction should be given every hour or two, according to the age of the patient and the urgency of the symptoms.

The *hepar sulphuris* (deuto-sulfure of potassium) was introduced to the notice of the profession, as a remedy in this disease, about twenty years ago, in a prize essay on cynanche trachealis, presented to the French *Ecole de Medécine.** Its introduction was founded on the erroneous doctrine that croup consists essentially in a morbid coagulability of the tracheal mucus, and which, it was asserted the sulphuret of potash had the power of preventing or correcting. It need, scarcely, be observed, however, that a remedy, which might possess such a power, without, at the same time exerting any influence in subduing the inflammation, could afford but little advantage in this affection; and the result of later experience goes to show that this, at first highly lauded remedy, exerts no obvious influence over the tracheal inflammation—and it is accordingly, now, very properly, universally abandoned.

When called to a patient labouring under this disease the fauces should be carefully inspected. It is now well ascertained that the albumenoid exudation which forms the false membrane, often commences on the surface of the inflamed tonsils, and thence spreads along the arches of the palate, and at last descends into larynx and trachea. In such cases the fauces will be found tumefied and of a dark red colour, and whether there be any appearance of false membrane or not, immediate attention should be paid to this inflammation. Dr. Mackensie, states that the application of a solution of the *nitrate of silver*, to the tonsils and soft palate, will, in such cases, often remove the membraneous crust completely, and procure speedy and great relief, and ultimately an entire removal of all the dangerous symptoms. "The solution which I employ," says Dr. Mackensie, "is a scruple of the nitrate of silver in an ounce of distilled water. By means of a large camel hair pencil, this solution is to be freely applied, once, or twice a day according to the severity of the symptoms, to the whole lining membranes of the fauces. The surface of the tonsils, or wherever else the fibrinous crust is actually in view will of

* Rapport sur les ouvrages envoyees au concurs, sur le *croup*, par la commission chargee de l'examen et du jugement de ces ouvrages. Paris, 1812.

course be particularly attended to; but I do not hesitate to push the pencil to the lower part of the pharynx. This remedy so far from being productive of any irritation beyond the mere mechanical and temporary one attending its employment, uniformly alleviates the symptoms of the croup, such as the difficult respiration, the barking cough, and the peculiar anxiety of the little patient."

In one instance which came under my notice, this application was decidedly beneficial. Laennec has published an account of some cases from which it appears that insufflation of very finely powdered alum, generally affords speedy relief, not only in this variety of the disease, but also in cynanche laryngea and tonsillaris. I have recently prescribed in a case of this kind, in which I derived unequivocal advantage from this remedy. Four or five grains of finely powdered alum should be introduced into the end of a small tube, (the barrel of a quill will answer,) and forcibly blown into the fauces. This practice appears to me of the utmost importance in cases of this kind, and ought never to be neglected, where the fauces on inspection, present an irritated and inflamed condition. Success in the treatment, must depend materially on the prompt reduction of this primary extra laryngeal inflammation.

With a view of expelling the false membrane, emetics have been recommended in the advanced period of the disease, and the records of medicine are not wanting in instances in which this object was effected by such a measure. It offers, however, but and exceedingly slender foundation to build any hopes upon. The same object has in one or two instances been obtained by exciting violent sneezing by blowing snuff into the nostrils through a small tube. As to the proposed operation of tracheotomy in order to detach and remove the membrane, all experience has so far decided against it.

CHAPTER XXXI.

CYNANCHE LARYNGEA.

This disease generally commences with a slight sensation of chilliness, alternating with flushes of heat, attended with a feeling of soreness in the fauces, more or less tenderness to pressure about the top of the thyroid cartilage, and some pain and difficulty of swallowing. The voice soon becomes changed into a thick, hoarse whisper, and on strong inspiration the air seems to enter into the trachea with difficulty, or as if it were forced through a very narrow aperture, and is attended with a dull rough sound. On inspecting the fauces, the tonsils, soft palate, and uvula, present a bright red, and œdematous appearance. There is seldom much expectoration, but the saliva is usually abundant and of a very viscid character. The febrile symptoms are not vehement, the face being for the most part pale, and the pulse frequent, small and tense. The tongue is covered with a thin white fur, over which a thick layer of transparent mucus is spread. As the disease advances, deglutition becomes more and more painful, and is apt to excite alarming and distressing paroxysms of suffocative breathing. The temperature of the surface is very unequal, some parts being very warm, whilst others are preternaturally cool. Dr. Armstrong observes, that the most peculiar and characteristic symptom of this affection, is the total inability to cough out, as is done in pneumonic and catarrhal complaints; the attempt to do so, resulting in a kind of suppressed or suffocative effort, terminating "in a low, grumbling and almost grunting sort of noise in the throat." The difficulty of breathing increases progressively as the disease advances, with frequent distressing paroxysms of dyspnœa, until, in unsubdued cases, death at last occurs by actual suffocation.

The disease sometimes approaches in a very gradual and insidious manner, the symptoms for a day or two, resembling

those of ordinary catarrh, with slight hoarseness. In some instances, it comes on suddenly and in a very short time acquires a fatal degree of violence. Mr. Porter relates two instances, where the individuals went to bed at night, without complaining of any illness, "and were found dead from this affection, the next morning." A case is also reported by M. Leville, which was so marked by erysipelas of the face, as to escape observation until within a few hours of its fatal termination.*

Cynanche laryngea may be distinguished from croup, by the following circumstances. In this affection there is always pain experienced in the larynx, generally referred to the top of the thyroid cartilage. Deglutition, too, is invariably painful and difficult, and after the disease is fully developed, often wholly impossible. On inspecting the fauces they are found somewhat swollen and inflamed; and every attempt to swallow brings on a paroxysm of suffocative breathing. None of these symptoms occur in cynanche trachealis, except occasionally swelling and inflammation of the tonsils and palate.

"The seat of this affection is more in the cellular tissue connecting the mucous membrane with the adjacent parts than in the membrane itself, although this latter structure is very frequently in an inflamed condition."† The tonsils, soft palate, larynx, and epiglottis are always tumefied, red, and in some instances vesicated. The rima-glottidis, also, is in general, so much swollen as nearly to close the aperture. The swelling of these parts appears to be œdematous, depending, mainly, on the effusion of serum into the submucous cellular tissue. Sometimes the inflammation is confined to the larynx, but in some cases, it extends down into the trachea and even into the bronchia. (Armstrong.) The principal seat of the inflammation, however, is in the epiglottis, which is usually "red, erect, œdematous, and during life resembles a piece of raw meat." (Porter.) Cases have occurred in which the inflammation terminated in the formation of one or more abscesses in the cellular tissue surrounding the larynx.

* Gazette de Sante 1827.

† Observations on the Surgical Pathology of the Larynx and Trachea, &c. By Wm. Henry Porter. p. 98.

Treatment. Laryngitis is a most rapid and dangerous affection. It often terminates fatally in less than twenty four hours, under the most energetic and judicious course of treatment. *Blood-letting* does not appear to exert the same degree of influence in arresting the progress in this affection as it generally does in other varieties of tracheal inflammation. Dr. Armstrong declares, that he has known "one hundred and sixty ounces of blood drawn, within the space of six hours" in adult patients, without making the slightest impression on the progress of the malady. In only one out of six cases, he says, did blood-letting appear to afford any obvious advantage. From the occasional vesication of the affected parts, and the serous infiltration into the cellular tissue, it would seem, that the inflammation partakes more of the erysipelatous than of the phlegmonous character; and this is probably, the reason why bleeding though prompt and copious, exerts so feeble an influence over its progress.

But although blood-letting does not often procure any prominent benefit in this affection, it is unquestionably decidedly indicated, and ought always to be promptly and efficiently practised. Dr. Beck of New York thinks, that the apparent inefficacy of bleeding in this complaint, is to be ascribed to the inadequate manner in which it has been usually employed. When carried to the extent of producing syncope, he says, it is as likely to do good in this as in other severe inflammatory affections of the respiratory organs. My own experience, does not, however, entirely accord with this observation. Nevertheless bleeding to the extent of producing fainting, ought to be regarded as an indispensable measure in the treatment of this affection. After blood has been efficiently drawn with the lancet, leeches should be largely applied to the throat. Martinet has reported a case, which terminated favorably under the employment of general and local bleeding and blistering. Dr. Arnold, has, also, related a case, in which the use of the lancet and leeching was decidedly beneficial.* A *blister* ought to be early applied to the throat, or to the back of the neck. In a case which I attended about two years ago, very obvious benefit was derived from blistering the back of the neck, while leeches were applied to the throat. It is not necessary or

*Med. Chir. Transact. vol 9, p. 31.

even advisable to delay the application of the epispastic until the momentum of the circulation has been moderated by depletion. The earlier the blistering is resorted to, the greater the chance of deriving advantage from it. Armstrong places more reliance on the repeated employment of antimonial emetics in this complaint than on any other remedy. After he had repeatedly failed in subduing the disease by blood-letting and counter-irritating applications, he resolved to try the effects of repeated emetics. He accordingly, resorted to the use of antimonial emetics in five cases, to which he was subsequently called; and, he declares, that "no circumstance in his professional life ever gratified him more than the great and sudden relief which vomiting afforded in these cases. It removed all the urgent symptoms at the time, and, being re-excited as soon as ever the slightest signs of stricture in the larynx returned, it at last completed the recovery." In a well marked case, which I attended a few years ago, in a child about four years old, blood-letting to the extent of producing syncope, followed by a blister to the throat, and three active emetics in the course of about fifteen hours, effected a cure. *Purgatives*, are very useful auxiliaries in the management of this complaint. The bowels should, in the first place, be freely evacuated by a full dose of calomel in union with rhubarb or julap; and afterwards kept in a loose state, by enemata, and repeated doses of calomel, both with a view to its aperient and constitutional operation. In the case reported by Dr. Arnold, the symptoms, though checked by blood-letting, did not entirely yield, until the gums became sore from the free use of calomel. From what I have witnessed in a case which occurred to me a few months ago, I am inclined to believe, that great benefit would, in general, be derived from blowing finely powdered alum through a small tube into the fauces. In cynanche trachealis attended with inflammation of the tonsils and palate, this application has within the last three or four years, been much employed with the happiest effect, both in Europe and in this country; and it seems highly probable that an early recourse to it in the present affection, would often do much good.

Tracheotomy has in several instances, been performed with entire success in this disease; and Dr. Porter strongly recommends

the operation whenever the remedies already mentioned do not make an early and decided impression on the laryngeal affection. "There are many reasons," he says, "why the practitioner should decide, at once, on the performance of tracheotomy, if the appropriate antiphlogistic measures do not afford early relief. Thus it allows the organ in which the inflammation is seated, to remain in a state of perfect repose. Considered as a wound, it adds nothing to the patient's danger; and as the relief it affords is, at least for a time, complete, it imparts confidence to the surgeon, and allows him leisure to examine the symptoms and the remedies accordingly. If however, the operation be *not early* performed, it had much better be let alone altogether." Dr. Crampton has reported a most interesting instance of the successful performance of this operation in acute laryngitis. Professor Regnoli, has given an account of two successful instances of tracheotomy in *chronic* laryngitis. Acute laryngitis, he observes, sometimes terminates in chronic inflammation and œdema of the epiglottis and mucous membrane of the larynx, which ultimately renders respiration extremely difficult, and may even cause death by suffocation In cases of this kind tracheotomy is the only means of relief in our power.*

* Nuvo mercurio, delle scienze mediche. Maza 1829.

CHAPTER XXXII.

ARACHNITIS. HYDROCEPHALUS. DROPSY IN THE BRAIN.

ARACHNITIS often makes its approaches in a very gradual manner. In many instances manifestations of an unusually irritable condition of the brain occur, and continue for several weeks before the disease is fully developed. During this irritative stage of the disease, the patient manifests a very irritable and fretful temper; he is wakeful, and when sleeping he grinds his teeth, and often starts or awakes suddenly with violent screaming and a peculiar expression of alarm in the countenance. Infants cry frequently without any apparent cause, and often start at the slightest noise and shrink suddenly as if pricked with a pin. The bowels are generally irregular, and the evacuations of an unnatural appearance. This irritative condition sometimes continues for a considerable time, without passing into actual inflammation, the child gradually regaining its ordinary state of health. If, however, some additional exciting causes supervene, such as difficult dentition, cold, or gastro-intestinal irritation from improper food or other offensive matters lodged in the alimentary canal, this irritative condition of the brain, is more or less rapidly aggravated, until it finally passes into actual inflammation. A new train of symptoms now ensues, which characterizes the inflammatory stage of the disease.

The patient now begins to experience transient pains in the head, and in most cases in the abdomen. These abdominal pains are occasionally very violent, but always very transient. The restlessness, and irritability of temper increase and the countenance is expressive of discontent and suffering. The face is usually pale with an occasional flush on one cheek. The eyebrows are, at times, contracted into a peculiar frown; and the eyelids generally kept in a half-closed state on account of the sensibility of the retina. The appetite is variable, in some in-

stances voracious, but more frequently impaired. The state of the bowels also is variable, being sometimes—indeed most generally—torpid, and at others relaxed, the stools presenting an unnatural appearance. As the complaint progresses the pains in the head become more and more severe. They are however seldom continuous; becoming occasionally much lighter, and at times for a few minutes entirely absent. The headache is chiefly seated in the forehead, shooting backwards and towards the temples. Children manifest their sufferings from this pain by almost constantly putting their hands to the forehead, and I have seen instances in which the little patient kept one of the hands continually applied to the head, and would not suffer it to be removed for an instant. At this period of the disease, the stomach is apt to become very irritable—the retching and vomiting being sometimes very troublesome, particularly on sitting up or taking any thing into the stomach. Children, affected with this disease, seldom bear the erect position without much uneasiness. I have met with many instances, in which the patient manifested no disposition to vomit while in a recumbent posture, but the moment his head was raised from the pillow, sickness and vomiting ensued. In the early part of the disease, however, the patient does not, generally, sleep easy with his head low. He is very restless, turning and tossing from one side of the bed to the other, and frequently groans, or whines, as if under the influence of pain. In some instances, the pain in the head, and the sickness and retching alternate with each other, the former ceasing as soon as nausea and vomiting come on. Frequent and deep sighing, is one of the most constant and characteristic symptoms of this malady. It is seldom very conspicuous, however, until the disease has made considerable progress, and is generally most remarkable, about the time when the inflammation is terminating in effusion, and some degree of cerebral torpor and somnolency are present. Delirium usually, occurs, during the latter part of the inflammatory stage: but it is never violent or furious, and very rarely so great, that the patient may not be roused from it, so as to give correct answers. Martinet observes that when the arachnoid membrane of the convexity of the brain is the principal seat of the inflammation, the delirium is much more constant

and conspicuous, than when the base of this organ is the part chiefly affected. The skin, during this stage is generally dry and above the natural temperature; and the pulse is frequent, quick, and tense or sharp, but seldom full. The tongue, usually, remains clean, or covered only with a thin white fur, with pale red edges; but in cases depending on intestinal irritation, it generally becomes loaded with a thick brown fur, which towards the termination of the disease becomes dark, dry and rough. After these symptoms have continued for an indefinite period, a new series of phenomena ensues, characterizing the third, or somnolent stage of the disease. The delirium now returns more frequently and continues longer; the countenance exhibits a peculiar expression of surprise and stupor, which it is impossible to describe, but which when once seen cannot be easily mistaken or forgotten. The conjunctiva, presents a suffused and reddish appearance; the pupils are dilated or much contracted, and the retina, in some cases, is extremely sensible to light. During sleep, the eyes are generally turned up, so as completely to hide the cornea under the upper lids. The patient now manifests a constant disposition to sleep; he becomes inattentive to surrounding objects, and when roused from his stupor he soon relapses into the same somnolent state. There is, in nearly all cases, great torpor of the intellectual faculties, or an impossibility, it would seem, of directing them to any object, or bringing them into action, so that the patient can seldom be induced to utter more than monosyllables. This mental apathy and torpor does not, however, occur, until disorganization or effusion is about taking place in the brain; for in the earlier periods of the disease, there is often great activity of the mental faculties. The drowsiness and mental torpor increase more and more, until a complete state of coma ensues. This morbid somnolency is the most constant of all the phenomena of the advanced period of the disease. In no instance where the complaint is not early arrested, does this symptom remain absent. In some cases, after the febrile and inflammatory symptoms have continued for some time, the coma comes on suddenly, in conjunction with paralysis of one side or of one extremity; but, it much more commonly supervenes in the gradual manner just mentioned. Indeed instances occur, in which the febrile irritation is so slight

as to escape attention, the first obvious manifestations of the disease, being an unusual drowsiness and mental torpor. In cases of this kind arachnoid inflammation, is no doubt going on without manifesting itself by the usual local and general symptoms of inflammation. It is a fact, well ascertained, that inflammation sometimes goes on in the brain, even to the extent of producing fatal disorganization, without manifesting its existence either by pain or any other symptom indicative of inflammation. Soon after the somnolent stage supervenes, paralysis generally occurs on one side, or in one extremity. In infants we generally, at first, notice a tremulous motion of one arm with the hand firmly bent inwards. By degrees the power of using the arm and leg of one side, becomes much weakened, which, in a short time, terminates in complete paralysis. At the same time, one or both the upper eye-lids, usually, become paralyzed, so that the patient, in endeavouring to look at any thing, is unable to raise the lids by their proper muscles, and is therefore obliged to draw them up with the integuments of the forehead by the contraction of the occipito-frontalis muscle. Strabismus, almost always occurs, previous to the supervention of paralysis, or deep coma. When the symptoms, last mentioned, namely strabismus, paralysis and coma occur, we may presume that disorganization or effusion has taken place in the brain. Soon after the inflammation has terminated in effusion, a sudden amendment, usually, takes place in all the alarming symptoms. The patient seems to have suddenly passed into a state tending to convalescence; and parents and friends, nay even physicians are apt to flatter themselves, that a speedy, though unexpected, recovery is at hand. This flattering calm is, however, almost universally fallacious, and of short continuance; for sooner or later, a paroxysm of convulsions suddenly supervenes, or the patient relapses into a state of fatal coma and stupor, which, at once and forever, puts an end to all hopes of a favorable termination. Convulsions rarely, if ever, remain wholly absent towards the fatal termination of this disease. The pulse which in the first and second stages of the complaint, is quick, frequent, and tense, becomes slow, full and generally irregular or intermitting, during the somnolent stage; but when paralysis, and especially convulsions supervene, it again becomes very fre-

quent, small, and corded. In the latter stage of the disease, vision, and occasionally hearing are wholly destroyed, yet general sensibility, or the sense of touch, usually remains to the last moment. Infants will sometimes readily lay hold of the nipple, and suck freely, although in a state of continued stupor and wholly deprived of the sense of seeing. The paralysis which occurs in the latter stage of the disease, is almost universally of the hemiplegiac kind. Infants are apt to keep the unaffected arm in continued motion.

The disease does not however always come on in the gradual manner or proceed with the train of symptoms just described. In many cases the attack commences and proceeds in a manner very similar to what occurs in the disease described by authors under the name of infantile remittent. In instances of this kind, the patient, after a few days' languor and drooping is seized with considerable fever attended with head-ache, flushing of the countenance and tenderness of the abdomen. The fever differs from that which occurs in the ordinary form of the disease by being subject to frequent and irregularly recurring intermissions. During the exacerbations there is generally considerable stupor; the patient often screams and starts up, in a state of great alarm and agitation. The stomach is always exceedingly irritable—vomiting being often excited merely by changing the position; and the bowels are in a state of obstinate constipation. The countenance is usually expressive of terror and pain or of dejection and intellectual torpor.

In some cases the disease is ushered in by convulsions without any previous manifestations of febrile excitement. In instances which make their invasion in this manner, however, there is always some evidence of ill-health previous to the occurrence of the convulsions—such as a peevish and fretful temper, variable appetite, irregularity of the bowels, tumid abdomen, foul breath, swelled upper lip, starting and grinding of the teeth during sleep—in short, all that train of phenomena which results from gastric irritation in consequence of worms, or other irritating substances lodged in the alimentary canal. I have known the first intimation of the presence of this almost hopeless disease, to be

coma, attended with deep sighing, cold hands and feet, pale countenance, and paralysis.

Occasionally the disease commences and proceeds to the last stage with scarcely any other symptoms than slight febrile irritation, with little or no pain in the head, but a very frequent desire to pass urine, which is voided in very small quantities and with much difficulty. I attended a case a few years ago, in which not above a gill of urine was discharged in twenty four hours, accompanied with no other manifestations of indisposition, than a slightly feverish, and drowsy condition during the first five or six days. Dr. Monro, observes, that "there are cases in which the little patient has a desire, every hour, to pass urine."

The liver almost always suffers considerable functional derangement in arachnitis. During the forming stage of the complaint, there is generally a manifest deficiency of bile in the evacuations, but in advanced periods, this secretion generally is not only copious, but decidedly vitiated in its quality. This is particularly observed in the latter period of the second stage, or in the commencement of the third stage, when the symptoms of cerebral oppression are about supervening: at this period, the stools, frequently, consist almost wholly of dark bile and intestinal mucus, presenting a very dark green and glairy appearance, resembling, as Dr. Cheyne observes, "chopped spinage," or, in some instances, tar.

Diagnosis. The characteristic symptoms of the first stage are: great irritability of temper; irregularity of the bowels; variable appetite; an irritated and quick pulse; wakefulness; and a peculiar frowning expression of the countenance. In the second stage: more or less continued pain in the head; torpor of the bowels; nausea and vomiting particularly on rising from the recumbent posture; irregular febrile exacerbations; a peculiar distressed expression of the countenance; sudden waking from sleep; transient and severe pains in the abdomen, alternating frequently with acute pain in the head; a circumscribed flush on one cheek; intolerance of light and sound; a hot and dry skin, with a frequent, tense, and generally active pulse. When the disease has advanced to the third stage it is easily

recognized, by great drowsiness, strabimus, hemiphlegia, paralysis of the upper eye-lids, and finally coma and convulsions. The disease with which arachnitis is most apt to be compounded is infantile remittent fever. In this latter affection, however, the remissions are regular and generally complete; whereas in arachnitis, there is the utmost irregularity in the recurrence of the exacerbations and remissions, nor are they so perfect as in infantile remittent. Dr. Cheyne observes that the appearance of the stools, also, affords us a good diagnostic sign between these two affections. In infantile remittent the alvine evacuations are very fetid, and of a dark brown or mud-like color; whilst in arachnitis, they are usually of a dark green or glairy appearance, resembling the fresh ordure of cows. In idiopathic arachnitis, the abdomen, almost always becomes collapsed or flattened, without an increase of the alvine evacuations; whereas in infantile remittent, the belly is generally tumid, tense, and elastic. This circumstance is much insisted on by Goelis, as a diagnostic sign between these complaints. There is seldom much secretion of saliva, in arachnitis, both the mouth and nose being usually dry. In infantile remittent, on the other hand, the saliva and mucus of the nose are generally abundant. In the former affection, the tip and margin of the tongue are commonly clean and red; whilst in the latter, the whole surface of the tongue is covered with a thick, white fur, which becomes darker, and dry as the disease advances. There is almost invariably severe and continuous pain in the head, in arachnitis; whilst in infantile remittent, or worm fever, headache is a very uncommon occurrence. In the latter disease, the little patient is almost constantly picking his lips and nose with his fingers; while in the former complaint he is apt to direct his hands to the forehead. In infantile remittent, moreover, the patient is often observed to have a movement of the deglutition during sleep, and when awake, he sometimes thrusts his fingers back into the fauces, as if desirous of removing something. These symptoms rarely, if ever occur in idiopathic arachnitis. In the former, the face is usually pale and leaden in the advanced periods of the disease; whereas in the latter, a conspicuous circumscribed flush often appears, on one or both cheeks. In arachnitis the head is generally the hottest

part of the body; in infantile remittent, the abdomen is usually the warmest part. "Vomiting is one of the most invariable symptoms in the first stage of arachnitis, and is attended with this peculiar characteristic—namely, it comes on unexpectedly and suddenly, without being preceded by much nausea, and is more frequent when the patient is supported in a sitting position, than in a recumbent posture. If a child vomits frequently, at considerable intervals, if it be costive or the alvine evacuations are irregular and unnatural in appearance, if the abdomen is collapsed or flat and painful to pressure, if the urine be slimy and high colored, if there is much headache, and if the whole state of the disease manifest an obstinate or unmanageable course, then we have great reason for believing that the complaint is principally located in the head, and that, if not subdued, it must result in cerebral oppression."

Although these circumstances will frequently enable us to form a satisfactory diagnosis, in relation to these two affections; it must be confessed, that in the commencement, arachnitis, is seldom cognizable; and that there is no symptom, which can be depended on as characteristic of the disease, during its early periods.

Dr. Alexander Monro has described a variety of hydrocephalus, which he calls the "hyper-acute form" of the disease, a form of very rare occurrence, and simulating in some of its most striking symptoms, inflammatory croup. "This rare form of the disease is very sudden in its attack. There is no previous headache, drowsiness, stupor, nausea, vomiting, paralytic state of any part of the body, or any other symptom denoting a derangement of the functions of the nervous system. It begins like croup. The child awakens in the night in a state of extreme agitation, and much flushed, and with a quick pulse; he is hoarse, and the sound of the voice when he inspires is similar to that of croup. The patient, at the onset of the disease, seems in a state of nervous irritation; often starts in his sleep, and in a short time, the disease assumes the appearance rather of a spasmodic affection of the larynx, than of the inflammatory croup. The matter thrown up by vomiting, consists generally of indigested food. The longer the disease continues, the shriller and hoarser the voice becomes."

In the dissections which were made of children who died of "this form of disease, Dr. Monro found in one instance, the vessels of the pia mater at the corpora quadrigemina and tractus obtici, and at the origin of the eighth pair of nerves, much distended with blood. No morbid appearance was discovered in the larynx and trachea." In another case, "the upper part of the brain, particularly the superior part of the posterior lobes, was covered with transparent gelatinous effusion;" and about an ounce of colored serum was found in the ventricles. "The vessels of the spinal marrow were turgid, those of the cervical portion of a vermillion-red color, and those of the lumbar portion of a dark-red hue. *The eighth pair of nerves* was of a deep uniform red color along its whole tract, as far as its branches, going to the lungs."

Dr. Burns attributes this form of hydrocephalus, "to an affection of the origin of the eighth pair of nerves, induced by the state of the extremity of the fifth pair, in dentition, acting on its origin, which is near the eighth."*

Prognosis. The prognosis in this disease must be always extremely unfavorable. The instances of recovery from it are indeed exceedingly few. In the course of twenty years' practice I have known but two fully developed cases, which terminated in health, and it has fallen to my lot to have seen, and prescribed for a very considerable number of patients ill with this appalling disease. I have already adverted to the flattering but illusive truce which sometimes occurs in the latter period of the disease.—Often, in the early period of my professional career have I been induced to think, by this ominous calm, that I had conquered the disease; and to announce to the anxious friends my good hopes of a speedy return to health. These hopes, however, were always blasted; and though taught by previous experience I have again and again thus hoped and thus encouraged, and always with the same painful conviction of the fallaciousness of this delusive interval. It is indeed extremely difficult to see so perfect a freedom from all the previous alarming symptoms, and not to flatter oneself, that

* The Morbid Anatomy of the Brain. By A. Monro, M. D. 1827.

recovery may ensue. When we see the little patient, emerge from a state of intense suffering and danger, and assume the smile and playfulness of convalescence—when from a state of stupor and unconsciousness, he awakens, as it were, to the feelings and actions of returning health, it is not easy to persuade oneself that all this hope-inspiring change is but the illusive prelude to the last, painful struggle, which inevitably leads to the grave.

Post-mortem appearance.—The appearances discovered in the brain, on dissection, are very various. In some instances the arachnoid membrane is minutely injected, presenting a very red appearance, throughout its whole intent; in others this membrane is found considerably thickened and opake. A purulent, sero-purulent, or sero-gelatinous matter, is in many cases found between the arachnoid and pia mater; and in the greater number who die of this conplaint, from one to four or six ounces of serous fluid is effused into the lateral ventricles of the brain.—In some cases, however, very little or no serous fluid is entravasated into the ventricles or between the membranes of the brain. Martinet and Duchatelet, in their interesting work on this disease, state that in eight cases out of twenty-six, there was scarcely a trace of serous effusion discovered within the cranium. In cases of this kind, the *substance* of the brain, is generally found conspicuously altered, both in consistence and color. Considerable portions of the brain are sometimes completely disorganised and reduced to a pap-like consistence; and instances have occurred, in which a portion of the cerebral substances was found much indurated. Occasionally cases are met with, where no other manifestations of cerebral disease, are detected, than signs of strong sanguineous congestion in the brain, with but little serous effusion and no marks of meningeal inflammation or structural lesion. Not unfrequently, unequivocal marks of previous disease in the abdomen, are detected,—sometimes the colon presents an enlarged and distended appearance; at others, considerable portions of it, are so much contracted as hardly to admit of the introduction of a large sized bougie. Frequently we find more or less extensive portions of the mucous membrane of the bowels, minutely injected; and I have seen it extremely red, throughout the whole extent of the

small intestines. In one case, the lower part of the ileum was of a dark livid color resembling incipient gangrene. Dr. I. C. Smith has given an account of a case of hydrocephalus, in which on post-mortem examination, the stomach was much contracted, and "on laying it open, an ulcer was found near the cardia, and the mucous and muscular coates, at this place were entirely destroyed, nothing remaining but a greenish mucus."

Causes.—A strong predisposition to this disease, is manifestly hereditary, or constitutional, in some instances. The peculiar aptitude to this affection, in some families, is sometimes strikingly exemplified. I know several families who have lost nearly all their children by this indomitable malady. It is difficult, if not impossible, to say in what this predisposition consists. It may be presumed, indeed, that children of an irritable habit of body, with a strong tendency to a preternatural determination of blood to the brain, are more liable to the disease than such as are of an opposite temperament. It has been supposed that children who have very large heads, are peculiarly predisposed to the arachnitis; but the correctness of this opinion is decidedly contradicted by experience and observation. It has been affirmed, moreover, that the scrophulous habit is often attended with a particular predisposition to this complaint—an observation which appears, indeed, to be well founded. In a large proportion of instances, Dr. Mills found, on post mortem examination, unequivocal appearances of scrophula; and out of twenty-two cases which came under the observation of Dr. Percival, eleven "were decidedly scrophulous."

Among the most common *exciting* causes of this disease in children, are injuries, inflicted on the head by blows or falls. It has been observed, however, that injuries of this kind, rarely give rise to arachnitis, unless they are sufficiently violent to cause some degree of concussion of the brain, and my experience leads me to think, that there is truth in the observation. Suppressed discharges, and repelled cutaneous eruptions, particularly the sudden drying up of serous discharges behind the ears, is apt to give rise to this affection, more especially, when aided by the irritation of dentition, and intestinal disorder. A sudden and

total suppression of the diarrhœa, which frequently accompanies dentition, sometimes excites arachnoid inflammation, and consequent dropsical effusions in the brain. Dentition is often intimately concerned in the production of this complaint. This process, when difficult, is always attended with an irritable and irritated condition of the system, and a preternatural determination of blood to the head. This, in itself, may be sufficient to excite the disease, in subjects who are predisposed to it, by constitutional habit, or from previous ill-health. It is probable, however, that dentition is seldom the sole cause of the disease; but that it most commonly acts in conjunction with other causes, especially with irritation in the alimentary canal. If, while dentition is going on, the digestive functions become disordered from improper diet, or some other circumstance, or if irritation be established in the bowels, there will be a concomitance of causes, peculiarly calculated to develope this fatal malady. The tendency of intestinal irritation to occasion an undue determination of blood to the brain, is well known. In infancy, this determination to the head, when long continued, is apt to give rise to inflammation of the brain, or the disease now under consideration. In middle age it frequently terminates in mental derangement; and in the decline of life, it is apt to result in apoplexy or palsy. It is believed by many, that arachnoid inflammation, or hydrocephalus, during childhood, is very generally the consequence of *intestinal irritation;* and there are, in fact, many circumstances, which go to confirm this opinion. In very many cases, I think it may be safely asserted, that in a large majority of instances, there are unequivocal signs of intestinal irritation, both previous and during the existence of the disease. The variable appetite—the irregular action of the bowels, with the unnatural appearances of the alvine discharges—the tumid and tender abdomen—the picking of the nose, and the pale and sickly aspect of the countenance, which so commonly precede the developement of the disease, all point to the alimentary canal as the original source of the irritation. Where this irritation exists, there is, doubtless, always a strong predisposition to the disease; and if to this be added some other exciting circumstance, such as a blow on the head, or the supervention of painful dentition, or general fever

from cold—or, in short, any occurrence which gives rise either to general arterial excitement, or local irritation of the brain, the liability to the disease will be greatly enhanced. Worms, acrid secretions, and an accumulation of fecal matter in the bowels, are the most common remote causes of this disease, when it depends on intestinal irritation. The strong tendency of intestinal irritation to give rise to arachnitis and consequent serous effusion into the brain is often strikingly illustrated in *cholera* infantum. When it runs into a chronic or subacute form, this disease frequently terminates fatally, under all the characteristic symptoms of the last stage of hydrocephalus. In two instances of this kind, in which I had an opportunity of a post mortem examination, I found the traces of arachnoid inflammation unequivocal, with copious serous effusion into the ventricles, and between the circumvolutions of the brain.*

Hooping cough, when it occurs in subjects naturally predisposed to the disease, more especially, when it is associated with a strumous diathesis, or a loaded and irritated state of the intestines, is no uncommon exciting cause of arachnitis. The violent and frequently recurring spells of coughing, forces the blood powerfully into the vessels of the brain, and where the supervention of the disease is favored by previous predisposition, or some other concomitant circumstance, may thus readily give rise to arachnitis. During the period of convalescence from measles and scarlatina, children seem to be much predisposed to this disease.

While we give all the importance to intestinal irritation, as a cause of arachnoid inflammation, which it unquestionably demands, we must bear in mind, that this same cause sometimes gives rise to a form of cerebral oppression, strongly resembling the last stage of arachnitis, but which is, nevertheless, wholly unconnected with cephalic inflammation. The determination to the head, in such cases, results merely in a state of strong venous congestion of the brain, giving rise to a somnolence and

* An interesting and striking case, in which hydrocephalic symptoms were produced by organic disease of the intestinal canal, is related in the Med. and Chir. Re July, 1826. p. 102.

oppressed state of the system, which may be readily mistaken for hydrocephalus. (Cheyne.)*

Treatment.—There are three principal indications to be kept in view in the treatment of arachnoid inflammation—viz. 1. to moderate the general febrile excitement; 2. to obviate sanguineous congestion and inflammatory irritation in the brain; 3. to remove those causes of irritation, which tend to produce and sustain a preternatural determination of blood to the brain.

The disease is not often detected in its incipient stage, on account of the gradual and insidious manner, in which it usually makes its approaches. When it does become an object of medical attention at this early period of its course, every effort should be made to remove the sources of irritation, and especially to obviate all undue determination of the blood, to the head. With this view, it is of the utmost importance to attend to the state of the alimentary canal; for it is in the stomach and bowels, especially that the primary irritation and exciting cause of the cerebral congestion most commonly exists.

Purgatives are, accordingly, the most valuable means we possess, for preventing the full developement of the cephalic inflammation at this early period of the disease. The bowels should, in the first place, be freely evacuated, by an efficient mercurial cathartic, and afterwards kept in a loose state by the daily administration of small doses of calomel, succeeded by a moderate portion of some mild purgative. From three to four grains of blue pills, or a few grains of calomel should be given in the evening, and followed next morning by a weak dose of epsom salts, rhubarb, or of castor oil, and continued until the alvine discharges assume a natural appearance. At first, it may be necessary to repeat these aperients daily, for four or five days in succession, after which it will, in general, be sufficient to administer them every second, third, or even fourth day, according to the

* Some writers contend, that hydrocephalus is almost invariably a sympathetic affection. Dr. Yates in particular, thinks that this disease has almost invariably its origin in the irritation of some organ remote from the brain. Spurzheim admits, that the primary irritation is frequently located in the abdomen; "yet anatomical dissections have convinced me," he says, "that, in the greater number of cases, the morbid appearances of the abdomen are secondary of the cerebral disease."

urgency of the symptoms. Mercurials are particularly useful in the incipient stage of this complaint, not only as aperients, but as means for correcting the functional torpor of the liver, which almost invariably attends the early stages of the disease. In addition to these means, especial attention must be paid to the proper regulation of the patient's diet. The appetite is sometimes very craving, during the incipient stage of the complaint, and it requires much care and vigilance to prevent children from taking improper food, or overloading their stomachs. It is of the utmost importance, to guard against these errors, as they never fail to accelerate the progress of the disease, and to render the most judicious remediate treatment abortive. The most simple, unirritating and digestible articles of nourishment alone must be allowed: such as boiled milk, barley-water, arrow-root, boiled rice, oat-meal gruel, weak beef or chicken tea, &c. All stimulating drinks must be carefully avoided. If dentition is going on, and the gums are swollen or inflamed, they should be freely divided down to the advancing teeth. Much benefit may sometimes be derived during the initial stage of the disease, from the application of blisters behind the ears, or on the back of the neck; and in cases preceded by the drying up of discharging sores behind the ears, or on the head, blistering, in this way, should never be neglected.

When the disease is once fully developed, prompt and decisive antiphlogistic measures, in conjunction with revulsive and derivative applications are indispensable. Blood-letting ranks, of course, among our most efficient remediate means at this period of the disease, more especially, when the encephalic inflammation has been caused by some injury inflicted on the head, or when it is the consequence of some general cause, such as cold. In instances of this kind, the pulse is almost invariably tense, quick, resisting and active; and nothing but prompt and very efficient blood-letting will make any decided impressions on the disease. Whenever the pulse is firm, and active, a sufficient quantity of blood should be taken away at once, to check, conspicuously, the momentum of the circulation. I am inclined to believe, that if bleeding were carried to the extent of producing an approach to syncope in the commencement of the inflammatory stage, our

efforts would be more frequently crowned with success than they unfortunately are. "The temporal artery, or a vein in the arm, should be opened, and the blood allowed to flow, until a very obvious impression is made on the system, or until the morbid actions of the vascular system of the brain are modified or totally changed. That such an effect has taken place, may be known by a paleness of the countenance, a shrinking of the features, and a tendency to deliquium; or by a diminution of, or removal of the heat, pain, weight, or uneasiness of the head." (Mills.) The blood-letting ought to be repeated, as soon as the febrile reaction and local inflammatory symptoms rise again. In cases depending on intestinal irritation, the arterial excitement is seldom very active. Here, blood-letting, though always indicated in the early periods of the inflammatory stage, must be employed with more caution; for copious bleeding, by weakening the energies of the system, is peculiarly apt to increase the morbid sympathetic affections of intestinal irritation.

With regard to the utility of *local bleeding* in this and other forms of encephalic inflammation, different opinions are expressed by practitioners. Nearly all the French writers on this disease are decidedly in favor of the local abstraction of blood. It appears, indeed, very reasonable to expect peculiar advantages from a mode of depletion which abstracts the blood more immediately from the affected parts; and yet, in relation to the present disease, a contrary opinion has been expressed by several eminent practitioners. Mr. North, in his work on the convulsive affections of infants, observes, "that he never found well marked symptoms of determination to the head, removed by leeches, however freely they were applied." In cases in which the cephalic determination depends on *intestinal irritation*, this observation is, perhaps, well founded; for the blood which may be thus removed from the vessels of the head, will be immedidiately replaced by the continued preternatural afflux of this fluid. It must be observed, moreover, that so long as the momentum of the general circulation is considerable, local bleeding can scarcely produce any other advantages than such as would result from abstracting the same quantity of blood by means of the lancet. General bleeding is, therefore, an essential preliminary

to the beneficial employment of leeches or cupping. After the impetus of the circulation has been moderated by the use of the lancet, *leeching* the temples, and along the posterior parts of the ears, is a valuable auxiliary in the treatment of arachnitis. It sometimes happens that blood cannot be obtained from a vein in the arm, and occasionally, not even from the temporal artery. In this case, the application of leeches is indispensable. They should be applied in large numbers, to the temples, occiput, and behind the ears, and the flow of blood encouraged, until a very obvious impression is made on the pulse, or a manifest tendency to syncope ensues. Dr. Mills, in his interesting paper on this disease, strongly recommends leeching, immediately after venesection, "in order to postpone the period of the exacerbation, or break the chain of diseased action. I have observed that these two modes of drawing blood, when successively employed, make a greater impression on the disease than either of them is capable of effecting when singly had recourse to."

Purgatives are among our most useful means for subduing this disease. When the bowels are loaded with irritating substances, and the cerebral affection is symptomatic of intestinal irritation, laxatives are, in truth, the main stay of our hopes. They are, indeed, almost equally useful in idiopathic arachnitis; for besides their effect in evacuating irritating causes, they tend, very particularly, to diminish the afflux of blood to the brain, and to moderate the general momentum of the circulation. "Should we 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—circumstances which we ascertain by the peculiarity in the appearances, or the pungent fetor of the stools, we must, by steadily pursuing the purgative plan, endeavor to effect a change; for while this is produced in the appearance of the stools, we are effecting a most important change in the hepatic system, alimentary canal, and all the parts including every organ essential to life, which is connected with them." In symptomatic cases, depending on primary irritation of the alimentary canal, the *milder* purgatives after the first thorough evacuation of the bowels, will, in general,

be more beneficial, than the repeated use of very active purges. Frequent purging, by the more active and irritating cathartics, though at first apparently useful, tend, ultimately, to increase the inflammatory irritation of the bowels, and consequently, the cerebral affection. It must be recollected that intestinal irritation is not always dependent solely on the presence of acrid or irritating substances in the bowels. The mucous membrane of the alimentary canal may be in a state of sub-acute inflammation, or of high vascular irritation. In cases of this kind, the milder laxatives are manifestly more appropriate than the more irritating articles of this class, since they are sufficient to evacuate the contents of the bowels without causing injurious irritation. Undoubtedly, the first purgative should be sufficiently active, to evacuate the intestines freely. From five to six grains of calomel, followed in a few hours, by infusion of senna and manna, or a suitable portion of epsom salts, will answer well for this purpose. The bowels must afterwards be regularly evacuated, so as to procure three or four discharges daily, by the use of small doses of calomel, promoted by castor oil, and laxative enemata.

In idiopathic arachnitis, however, the intestines are generally very torpid, and can seldom be sufficiently moved by the milder purgatives. In cases of this kind, it is often necessary to resort to large doses of the most active cathartics, in order to procure adequate evacuations from the bowels. The same difficulty sometimes occurs, in cases attended with a great accumulation of fecal matter in the intestines. *Calomel* should always enter largely into the purgatives employed in this disease. Independent of its aperient effects, its constitutional or specific influence, if early obtained, is sometimes attended with great benefit. From one to three grains may be given every three or four hours, according to the age of the patient, with an occasional dose of of castor oil, infusion of senna, or epsom salts. Where there is reason to suspect the presence of worms in the intestines, anthelmintics should be employed, in conjunction with purgatives. An infusion of spigelia with a small portion of senna, may be used with a prospect of much advantage in such cases. In some instances the stomach is so irritable in this disease, that no articles will be retained a sufficient time to operate on the bowels.

Where this state exists, we must endeavor in the first place, to allay the gastric irritability, and this may in general be effected by minute doses of calomel and ipecacuanna: the one sixth of a grain of the former, in union with one-fourth or one-third of a grain of the latter, has repeatedly succeeded in my hands to restrain the tendency to vomiting in this disease.

Mercury, as has been already observed, is undoubtedly a remedy of valuable powers in the treatment of this affection. Doctors Percival, Dobson, Rush, Cheyne, Mills, not to mention many other names of great celebrity, have related instances which yielded to the influence of this potent remedy. Employed with a view to its constitutional operation, mercury often contributes very powerfully to the reduction of visceral inflammation; and experience has shown, that in the present affection, it deserves to be regarded as one of our most valuable remedies. It is, in general extremely difficult to procure the constitutional influence of mercury, to an obvious extent, in very young children; and hence, to obtain this desirable object sufficiently early to derive decided advantage from it, many have advised the use of mercurial frictions at the same time that calomel is administered internally. Dr. Mills of Dublin, strongly recommends the use of calomel in union with opium, "as soon as a check has been given to the disorder of the head," by venesection, leeching and purgatives. "The good effects," he says, "of a combination of these remedies, seem to depend on their power of equalizing the circulation, increasing the secretions, and exciting the action of the cutaneous vessels." I cannot bring to my recollection a single instance, in which this remedy, when judiciously administered, after depletion, was followed by disagreeable consequences; and in cases unaccompanied by great irritability of the stomach, its powers are occasionally increased by the addition of small quantities of ipecacuanna, or antimonial powder."* The "watery extract," he thinks, is decidedly the best preparation of opium for this purpose. "It procures rest, diminishes pain and irritation, and diffuses throughout the frame an agreeable sensation, at the same time that it is devoid of any narcotic or nauseating

* Transact. of the King and Queen's College of Physicians in Ireland. Vol. v.

quality, and does not cause vertigo, pain, or a sense of fulness in the head." My own experience enables me to bear testimony in favor of this preparation; for I have seldom known it to produce the disagreeable effects that are so apt to follow the use of laudanum or opium, in its ordinary state.

Dover's powder, also, has found advocates as a remedy in this disease. Drs. Brooke, Percival, Cheyne, and Crampton,* all speak favorably of its employment in hydrocephalus. After adequate depletion and purgation, in cases connected with *intestinal irritation*, small doses of this composition often prove highly serviceable, by allaying general irritability and inducing a gentle diaphoresis. It should be observed, however, that in the idiopathic form of the disease, opiates of every description, must be carefully avoided, as their tendency to increase the flow of blood to the brain, could hardly fail to prove very injurious. When preternatural determination to the head depends on a remote focus of irritation—as in the mucous membrane of the bowels—opiates, by diminishing nervous excitability as well as local irritation, will frequently reduce, also, the irregular determinations which depend on such irritations. It is in cases of this kind only, that we may venture on the exhibition of Dover's powder, and not in these instances until the impetus of the circulation has been moderated, and the alimentary canal well evacuated.

Dr. Stocker, of Dublin,† speaks very favorably of the use of *James' powder* in hydrocephalic affections. According to his observations, it tends, very considerably, to lessen the determination of blood to the brain. It should be given in small but frequent doses, and may be very properly administered in union with calomel. Dr. Monro states that he has cured several cases of this disease by a plaster composed of tartar emetic and wax ointment, applied to the head, in conjunction with the internal use of calomel combined with James' powder. He states, that he has found this combination peculiarly useful, in restoring the healthy action of the bowels. *Tartar emetic*, also, has been used

* Transactions of the Associat. of Fellows and Licentiates of the Queen's College of Physic in Ireland. Vol. vii.

† Dublin Medical Essays, 1806.

with great advantage in this disease. Laennec, has reported some cases of acute hydrocephalus, in which he administered twelve grains and more of this article during the day, with complete success.

Mr. Newnham asserts, that *green tea* has a strong tendency to lessen morbid vascular excitement in the brain. "In the acute irritation of the membranes of the brain in children," he says, "the efficacy of green tea has been strongly marked in my practice. Exhibited during the early symptoms, as soon as a sufficient quantity of blood has been taken, and before effusion occurs, it has proved a more powerful means than any other we possess, of controlling the morbid action, which, if suffered to proceed to its second stage, is scarcely to be overtaken by any treatment."*

Nothing is more common in the treatment of this disease, than the application of blisters to the shaven scalp; but this practice is, I conceive, of very doubtful propriety. I have always preferred placing them on the back of the neck or behind the ears, while ice or cold water is applied to the top of the head, and warm or rubefacient applications made to the feet. Dr. North, whose interesting work I have already mentioned, observes, "that blisters to the head are decidedly prejudicial in the convulsive diseases of infants;" and the same observation is applicable, I think, to the disease under consideration. The application of ice or iced water, in the manner mentioned in the last chapter, may be accounted a very useful auxiliary in the treatment of arachnitis, and to favor its revulsive influence, warm or stimulating applications to the feet may be usefully employed. Dr. Regnault recommends in very strong terms, the application of *moxa* in this complaint;† and its known efficacy in subduing deep-seated articular inflammation, justifies the expectation of considerable advantage from its use in arachnoid inflammation. Neither this application nor blisters, however, should be resorted to, until the activity of the circulation is reduced by general and local blood-letting. The tartar-emetic ointment also may be very beneficially applied. (Monro.)

* Med. Chir. Rev. July, 1827.

† Medical and Physical Journal, Vol. xi. p. 16.

CHAPTER XXXIII.

PERITONITIS. ASCITES.*

SUBACUTE or chronic inflammation of the peritoneum, and consequent effusion of serum into the cavity of the abdomen, is not a very uncommon disease among children. Its progress through the first or inflammatory stage, is often so obscure as to escape particular attention, until effusion has taken place, and the abdomen has become tumid and tense. In many instances slight pains are occasionally experienced in some part of the abdomen, which are usually ascribed to flatulency or disorder of the bowels. The patient manifests a sullen and fretful temper, and is disinclined to engage in the usual amusements and sports of children. When pressure is made on the abdomen, a sensation of soreness is felt, in certain parts, generally about the umbilical region; and the same effect sometimes results from coughing, sneezing, or any sudden concussive motion of the body. At night the patient is restless, and his sleep is broken and "of shorter duration than formerly." The face and whole surface of the body are pale, and the countenance expressive of discontent, suffering and languor. The appetite is variable; the tongue covered with a white fur along the middle, with nearly clean and pale-red edges; the bowels are irregular, being sometimes costive, and at others affected with diarrhœa. In cases of this kind, the pulse is seldom perceptibly affected in the forepart of the day; but in the afternoon, and particularly towards evening, it generally becomes somewhat accelerated, contracted, quick and sharp. The surface is seldom above the natural temperature,

* Dr. H. Wolff, of Bonn, is I believe, the first who has described this disease, as it occurs in infants. He describes it as "a peculiar form of ascites in children," in a paper published in Hufeland's and Osann's "Journal des practischen Heilkunde" for May, 1829. I have not seen Dr. Wolff's memoir on this subject; and avail myself of an interesting review of it, published in the 7th vol. of the North American Medical and Surgical Journal.

except during the slight evening exacerbations, when it becomes preternaturally warm and dry.

The disease does not, however, always commence and proceed in this obscure manner. In some cases, "the pain in the abdomen is constant, severe, and much increased by external pressure, and is attended with vomiting, a hot skin, a quick, firm and contracted pulse," and great muscular debility.

After these symptoms have continued for an indefinite period, varying from five to fifteen or twenty days, effusion begins to take place into the cavity of the peritoneum, and the abdomen gradually becomes enlarged. The nature of the abdominal distention is rendered manifest by the fluctuation produced by percussion. If the progress of the disease be not interrupted, "the abdomen gradually increases in size; the inferior extremities become emaciated; the skin at the upper and inner part of the thighs, hangs in folds; the fluctuation of the abdomen becomes less perceptible as the disease advances, while the tumefaction continues unabated. Every part of the body, with the exception of the face, becomes emaciated; the little patient loses rapidly its strength; the lower extremities are no longer able to bear the weight of the body: in the midst of these symptoms, the appetite may, however, continue, or even be increased. The bowels are in general variable, being at one time affected with diarrhœa, at another constipated, or at least seldom opened. A febrile excitement now occurs, and the child, in a state of extreme marasmus, sinks gradually into its grave." (Wolff.) The writer just quoted, mentions a peculiar appearance of the countenance occurring in the second or hydropic stage, which he regards as one of the most certain diagnostic signs of the disease. "The appearance referred to, consists of a tumefaction of the skin at the root of the nose, immediately between the eyes." "The parents of my patients," he says, "frequently noticed a change in the expression of the countenance, without being able to say in what it consisted; but as soon as I directed their attention to the tumefaction of the skin at the spot mentioned, they agreed with me, that the change in the appearance of the child's countenance arose from it, and were surprised, they had not discovered it themselves."

Causes.—This disease appears to be frequently the consequence of gastro-intestinal irritation; or rather of mucous inflammation of the alimentary canal—the inflammation passing from the mucous membrane, to the peritoneal covering of the bowels. Crude, irritating and indigestible articles of nourishment, are probably the most common exciting causes of this affection in children. I have witnessed two cases within the present year, both of which were preceded by prominent symptoms of intestinal irritation, for many weeks before the peritoneal affection became obvious. In adults, I have met with several very striking instances of subacute peritonitis, and consequent serous effusion into the abdomen, brought on by acute mucous inflammation of the bowels, in consequence of irritating ingesta. There are, doubtless, various other causes which may give rise to this affection in children. It may be the result of acute or chronic inflammation of the solid abdominal viscera—particularly of the spleen and liver. Blows and other injuries inflicted on the abdomen; repelled cutaneous eruptions; cold, and perhaps protracted constipation, may give rise to the disease.

When properly treated during the first stage, this disease may, in general, be readily subdued. "Even in the first period of the stage of effusion, it is by no means incapable of being arrested; but when neglected, mismanaged, or submitted to medical treatment only in the advanced period of the second stage, as is but too commonly the case, death is the ordinary result." The great difficulty, indeed, arises from the gradual and obscure manner in which the disease frequently advances through its inflammatory stage, so that very few cases are recognized or properly understood, until effusion has taken place. During the first or inflammatory stage, the symptoms are usually ascribed by the parents, to worms. Anthelmintics are accordingly resorted to, which seldom fail to aggravate the disease, and to hasten its progress to an incurable state. Dr. Wolff asserts, that "most of the severe cases which had fallen under his notice, were those in which anthelmintics had been administered, either by the parents, or occasionally by a physician, on the first appearance of the symptoms, from a supposition that they owed their origin to the existence of worms in the intestines." This practice, he says, is

extremely pernicious. "For although, in a few instances, worms may be discharged, yet so far from the patient's disease being removed, every symptom becomes aggravated; the pain of the abdomen increases in intensity, and is rendered more constant; vomiting is excited, the appetite is entirely destroyed, the thirst augments, the febrile symptoms are rendered more marked; and the patient is apt to suffer severe attacks of colic, soon after eating."

Treatment.—During the inflammatory stage, local depletion, and counter-irritating applications to the abdomen constitute our principal remedies. After blood has been abstracted by leeching, to an extent corresponding with the age of the patient, and violence of the local symptoms, a large blister should be applied to the abdomen, and kept discharging by dressing it with mercurial ointment. I have never in children derived any decided benefit from pustulation with tartar emetic ointment. The warm bath, and fomentations to the abdomen, may also be used with advantage. Internally, small doses of calomel and ipecacuanna, should be regularly administered. A fourth of a grain of each may be given three or four times daily; but if no mercurial ointment is used externally, the quantity of calomel should be increased to a half a grain. Should the calomel not keep the bowels sufficiently loose, a small dose of castor oil must be occasionally administered. To allay general irritation, a few grains of Dover's powder may be given in the evening with much advantage. Throughout the whole course of the disease, the patient should be restricted to the blandest and simplest articles of nourishment. Without strict attention to this important injunction, there can be but little hope of a cure in this affection. Arrowroot, tapioca, sago, rice, boiled milk and crackers, barley water, weak chicken tea, &c., constitute appropriate articles of diet. In the second stage, that is, after effusion has taken place into the abdomen, leeching may still be useful if the abdomen be tender to pressure. At this period of the disease, much benefit may sometimes be derived from frictions on the abdomen, with mercurial ointment. Laennec and Velpeau speak in the most favorable terms of this practice; and my own experience has

furnished me with unequivocal evidence of its usefulness. Dr. Wolff strongly recommends calomel, with very minute portions of digitalis; and at a still more advanced period, "digitalis with cream of tartar in the form of powders." He asserts, that under the use of these remedies, most of the patients he treated became convalescent, at the end of two, three, or at most four weeks. Whether mercury be used externally, as recommended by Laennec, or internally, *digitalis*, is doubtless a most important auxiliary, and should never be omitted after effusion has taken place. Irritating diuretics, and drastic purgatives, are extremely improper. They never fail to aggravate the disease.

CHAPTER XXXIV.

VACCINA. VACCINE DISEASE.

Much uncertainty still hangs over the origin of the vaccine disease. The opinion that it is derived from the complaint in horses, denominated *grease*, is sustained by very imposing, though not conclusive, evidence. We have excellent authority for believing, that inoculation with the virus of *grease*, occasions an eruption in the human subject and cow, precisely similar to that arising from vaccina. Loy, Sacco,* Decarro of Vienna, and Frise, director of vaccine inoculation in Silesia, have all performed this experiment, according to their several statements, with perfect success; and so well assured were the two latter gentlemen, of the identity of the two infections, that it is said they used indiscriminately the matter of *grease* and of vaccina for inoculation. Cazenane met with two cases in the hospital of St. Louis, of true vaccine disease on the hands of grooms, having the care of horses affected with *grease*. By the application of the recent blackish matter of this complaint, to the raw surface of a sore on the teat of a cow, Ring succeeded without difficulty in producing genuine vaccina. The same gentleman publishes a letter from Mr. Rankin, wherein is related a case of pustular disease, closely resembling the vaccine affection, produced on the hands and face of a farmer by the virus of the equine disorder. Besides, it would seem probable, that persons infected with a pustular disease from this source, enjoy an immunity from the contagion of small pox. Dr. Jenner has recorded a case of this

* Neue Entdeckungen uber die Kuhpocken, die Mauke u. Schaafpocken. Translated from the Italian by W. Sprengel. 1813.

kind. There can be no doubt, however, that further and more careful observations are requisite to the formation of a correct judgment on this point. Dr. Jenner supposes, that the infection of *grease* is transmitted through the intervention of the male domestics, who, after dressing the heel of the horse, proceed without cleansing themselves to aid in milking the cow. But, in several countries where vaccina is prevalent, it is well known that the grooms have nothing to do with the offices of the dairy; and in America, where horses and cows are attended to by different persons, the latter are sometimes affected with the disease, though running in pastures from which the horse is excluded. These facts, though they do not disprove the similarity of the two viruses, throw many difficulties in the way of accounting for one as the consequence of the other.

It is now well known that sheep are subject to an eruptive disease about the mouth and head, the matter of which being inoculated, will produce effects very similar to those of *grease*. It is also affirmed, that persons, to whom this infection has been communicated, are rendered insusceptible to the contagion of variola. We find this fact stated in a letter, addressed by Mr. W. Bruce, consul at Bushire, to Erskine of Bombay. After very extensive and cautious enquiry, he felt justified in yielding full credence to the report of several tribes of the natives, that those of them who attended to the flocks, were not unfreqently affected with an eruptive malady, caught from the sheep amongst whom it widely prevailed, and were thereby completely secured against the attack of small-pox. Sacco and Richter likewise bear testimony, that inoculation with this infection confers on the human subject an exemption from the contagious influence of variola.

The curious circumstances we have mentioned in relation to the marked affinity subsisting between the various eruptive disorders furnish no slight grounds for the opinion, that they are all essentially identical in their nature, and derived from the same ultimate source. The hypothesis with regard to variola is, that it was originally nothing more than the cow-pock, or the *grease* of horses in Arabia, transferred casually or otherwise to the human system, and that by such transference and by its continuous

propagation through the human species, it gradually deteriorated, until it had acquired all the virulence and activity of what is now termed small-pox.* This hypothesis is by no means extravagant. It would seem from experiment, that the milder sort of small pox under proper management, may be made to assume by successive inoculations so meliorated a form as hardly to be distinguished from vaccina. Dr. Adams inoculated a certain number of children, with lymph taken from the pustules of a mild variety of variola, denominated by him the *pearl sort*. With the matter of the mildest of the resulting cases, he inoculated a second number, and so on, till he produced a small pox so meliorated as to resemble the vaccine disease. If small pox can thus be made to take on the gentle nature of the vaccine disease, the inference is, that vaccina under certain circumstances may have acquired all the virulence of the variolous contagion. Another argument in favor of the identity of the two affections, grows out of the commonly received fact, that two diseases, arising from essentially distinct contagions, cannot exist simultaneously in the same individual. If a subject for example, be inoculated at the same time with the virus of small pox and that of measles, the influence of the one will be entirely suspended, until the other has commenced and finished its course, when it too will develope itself and run its usual career uninterruptedly. Now if the matter of vaccina, and that of variola be inserted at once in separate parts of the same body, the eruptive distemper resulting, will pursue a *simultaneous* course, exhibiting precisely the same character, as if their respective viruses had been inoculated at different periods. This is probable evidence of their original identity, how dissimilar soever they may have been rendered by accidental circumstances. But positive evidence is not wanting to sustain this point. Cases are recorded where variolous matter inserted in the udders of cows, produced in them a pustular affection, not to be distinguished from cow-pox. This observation is made by Richter on the authority of Garsner.† We may also remark here, on the authority of Da Lisa, that sheep, inoculated with the virus of variola, are protected entirely from what is

* Dictionnaire des Sciences Medicales.

† Speciell Therapie.

called sheep-pox. Inoculation in them is said to produce but one pustule at the point of insertion.* If we may rely on the correctness and veracity of Dr. Ozaman, of Lyons, and more recently, of Dr. Sunderland, of Barman, the original identity of vaccina and variola, is established beyond doubt. The former in a paper read in the French Academy of Medicine, in July, 1830, asserts, that the inoculation of variolus matter, mixed with fresh cow's milk, will develope an eruption similar in all respects to that occasioned by the vaccine virus, and will fully answer for the inductions of the usual vaccine disease.† Dr. Sunderland's experiments‡ would seem still more conclusive. The following experiment performed by him is so interesting, we will give it in detail. A woollen bed cover is permitted to lay on the bed of a patient who has died of small-pox in the suppurative stage, or who, placed in a narrow and badly ventilated apartment, is suffering from the disease in a considerable degree, until it is well saturated with the contagion. It is then rolled up, wrapped in linen, and spread for twenty-four hours on the back of a cow, in such a way that the animal cannot throw it off. In the same manner, it is extended on the back of each of three other cows, for the same length of time; after which it is so suspended in their stall, that they may constantly inhale the contagious effluvia as they arise. In the course of a few days the animals become sick and feverish; and on the fourth or fifth day, a pustular eruption breaks forth upon the udders and other parts, covered with hard skin and displaying the usual appearance of the vaccine disease, soon becomes filled with lymph. Inoculation with this lymph, which precisely resembles the matter of genuine cow-pock, will produce perfect vaccina.

Symptoms and Progress of Vaccina.—There are two varieties of vaccina, the *casual* and *inoculated*. The casual cow-pock is apt to affect the joints and tips of the fingers of domestics, having the care of cattle laboring under the vaccine disease. It is always more severe than the inoculated variety, on account of the

* Mediz. Chirur. Zeit. 1809. No. xliii. Salsbury.

† Rev. Encyclop. Aout. 1830.

‡ Journal der Praktischen Heilskunde, Jannar. 1831.

number of vesicles produced, and the membranous, rigid structure of the parts involved in the eruption. Inoculated vaccine is, in general, indicated by one pock alone, and its whole course may be divided into two periods.

1st. The first period commences towards the close of the second day after the insertion of the virus, at which time may be discerned a minute point of inflammation at the spot where the puncture was made. This point is more distinct on the third day, and on the fourth, it has the form of a very small pimple, surrounded by a faint and narrow inflamed areola. There is a gradual enlargement of the pimple, and on the fifth day, it begins to display a perfectly regular and circumscribed outline with a flattened surface, and a small depression at the centre, somewhat darker than the rest of the surface,—an appearance it retains throughout its whole subsequent course. The pimple about this time becomes a vesicle, containing a limpid fluid, and presents a dull whitish aspect. From the fifth to the ninth day, the circumference of the pock continues to enlarge, without its elevation being perceptibly increased, so that its flattened appearance becomes still more remarkable.

2. The second period begins at the full maturity of the pustule, which takes place on the ninth, when constitutional derangement, if any occurs, is apt to supervene. In some instances, the axillary glands at this period become irritated and swollen, and the patient complains of drowsy languor and faint creeping chills, alternating with flushes of heat. Constitutional symptoms are not unfrequently altogether absent. By the tenth or eleventh day, the belt of inflammation around the pustule, that began on the eighth day to widen, has become a broad, beautiful and vividly red areola encircling the pock. The areola is now perfect, and attended with some degree of tumefaction and hardness. The central indentation of the pustule begins, on the eleventh day, to assume a darker hue, and this darkness gradually spreads towards the circumference: so that by the fourteenth day, the surface of the pock is transformed into a brown scab, which grows darker and darker, acquiring a deep brown or mahogany color. In a few days more, the circumference of the scab becomes loosened, but the centre still retains its attachment, till between the

third and fourth week from the time of vaccination: the whole then falls off, leaving a slight, regularly defined depression in the skin, and a scar which is indelible.

Deviations.—Such is the *ordinary* course of the disease, for it is occasionally subject to deviation. The period, for example, intervening between the insertion of the virus and appearance of the pustule, is sometimes prolonged to the tenth, fifteenth or even twentieth day. In some cases, the whole course of the disease is completed in eight or nine days, well-formed lymph being produced by the fourth day. When the umbilicated indentation in the centre of the pustule is wanting, there may be two pustules, partially blending with each other. It is seldom that inoculation produces more than one pock, but occasionally one or more smaller pustules manifest themselves in the vicinity of the primary one. Instances indeed have occurred, where they appeared in considerable numbers on different parts of the body. In the report of the central vaccine committee of France in 1818, 19, it is stated that a spontaneous eruption of many pustules had occurred in several cases after vaccination; and moreover, that the matter of this eruption had the power of inducing as perfect a disease as that excited by the virus of the primary pock.

Considerable inflammation sometimes supervenes on the day succeeding the vaccination, and an elevation of the cuticle takes place at the point where the puncture was made. In this case, the failure of the operation may be considered certain. The inflammation, after continuing a day or two, speedily subsides, without leaving any local affection.

Instead of a vesicle, a true pustule is occasionally formed, the inflammatory action arising on the day after the vaccination, or, at the furthest, on the succeeding one. A well-defined areola encircles the pustule, in which instead of a depression, there is a conspicuous elevation of the centre above the ridges. Its increase is rapid, and about the fifth day, it is converted into a yellowish brown scab, which soon disappears without leaving any scar. In this case, also, the operation is abortive and should be repeated.

Spurious Pock.—According to Willan, there are three varieties of spurious pock. In the first, though the vesicle is perfect, there

is no areola around it on the ninth or tenth day. In the second, the vesicle is much smaller than the genuine vesicle, and is pearl-colored, flattened, without a rounded or prominent margin, with a hard, inflamed and slightly elevated base, and an areola of a dark-red color. The vesicle in the third variety, is small and pointed, with a very extensive, pale-red areola. The areola in the two latter varieties, are observable on the seventh or eighth day, and disappear about the tenth. A very small scab is then formed, which is not so regular in its shape as that of the true vesicle. The spurious disease may arise from the following causes; 1st. The existence of some cutaneous distemper, capable of counteracting or perverting the action of the genuine vaccine virus. 2d. Certain idiosyncrasies, or a depraved condition of the system, vitiating or impeding in some way the regular operation of the virus. 3d. Vaccination with spurious matter, or with genuine matter whose virtues have been impaired by long keeping; or with matter taken from a true vesicle at too late a period. Beside these, friction with the clothes, or by other means, so as to cause a rupture of the vesicle, and the frequent abstraction of its lymph by punctures, may be considered as depriving the disease of its genuine character.

The spurious and true cow-pox sometimes pursue their course simultaneously in the same individual, in which case it does not seem that the protective power of the genuine virus is in any degree diminished.

Diagnosis.—In attempting to distinguish true vaccine from false, we should carefully observe the following particulars:

1st. In the genuine disease, inflammation, saving that which occasionally arises from the irritation of the puncture, is scarcely observable until the third day, and sometimes considerably later. On the other hand, the spurious affection is marked by an elevation of the cuticle and no slight degree of inflammatory action, so early as the second day.

2d. The small inflamed point, in true vaccina, appearing in two or more days after the insertion of the virus, has a gradual increase until the seventh day after its first manifestation, when it is in a state of perfection. The spurious pustule becomes ma-

tured, and finishes its course in, a much shorter time; the scabbing commences on the third or fifth day after the development of inflammation.

3d. A beautiful, circular, and well-defined areola almost always surrounds the pustule of genuine vaccina, and is seldom perfect until the seventh or eighth day. In the false disease, the pustule is begirt with an *irregular*, superficial inflammation, supervening on the first or second day after the appearance of the pustule; and the pustule itself is more like a common festering sore occasioned by a thorn, than a pustule excited by the vaccine virus.

4th. The genuine pustule is perfectly and regularly defined, with a flattened surface, and a slight central indentation, and contains a colorless, limpid fluid. The spurious pock is more elevated, not depressed in the centre, is irregularly circumscribed, and contains an opaque purulent matter.

Remediate Treatment.—General remediate treatment is rarely required in the inoculated form of vaccina. Febrile excitement occasionally exists, and even a slight exanthema may appear, in which case we should direct a low diet, diluent drinks, and a gentle aperient, together with spiritus mindereri or sweet spirits of nitre. The vesicle should be especially shielded from friction, whereby it is apt to be greatly irritated, particularly about the time when the areola is making its appearance. From friction or other cause, the inflammation and swelling around the pustule sometimes become so severe as to demand immediate relief. Cold water, a weak solution of sugar of lead, or poultices made of lead-water, should be applied to the part, to allay pain and inflammation, at the same time that laxatives, with some of the milder refrigerant diaphoretics are given internally to subdue febrile irritation.

THE RELATION OF VACCINA WITH OTHER DISEASES.—I have thought it proper to defer until now, the consideration of the relation of the vaccine disease with other affections, that I might present in a connected form all I have to say on this part of our subject. It was early noticed, that the infection of vaccina had a

tendency to correct a general depravation of the system and to remove various chronic complaints, especially those of the lymphatic and cutaneous systems. There are well authenticated cases, in which crustea lactea, scrophulous ophthalmia and tumors, and certain varieties of scaly tetter have been entirely cured by the constitutional influence of the vaccine virus. Herpetic eruptions, after vaccination, not unfrequently assume an appearance resembling that of vaccine pustule, and fade away with the desiccation and falling off of the scab. Violent whooping cough has been arrested at the moment of the appearance of the eruption, and permanently cured. Of the power of vaccina to moderate and abridge the course of pertussis, I have myself witnessed many examples. In this respect, it differs greatly from both casual and inoculated small pox, which have been known to excite the active developement of disorders, to which there existed previously a latent disposition. In accounting for these peculiar effects of the vaccine disease, we can hardly suppose that its influence over other disorders is specific in its nature, otherwise it would be more constantly and uniformly exerted. It may be considered rather the result of an irritation, universally diffused throughout the system, penetrating the minutest portion of living fibre; for it is well known that the creation of a comparatively slight general irritation is sufficient, at times, to relieve a graver disorder already existing. We may observe, that the meliorating influence of vaccina over other complaints, is generally more manifest, when a considerable degree of irritation is produced. Hence, when such an influence is desirable, it may be proper to insert the virus by several punctures.

The diminution in the prevalence of small pox, occasioned by the general introduction of vaccination, is, if we may believe Dr. Watt, very curiously associated with the increase of measles. His observations, which are restricted to Glasgow, go to prove, that the increase of measles in that city, since the adoption of vaccination, has borne a nearly equal proportion to the decrease of small pox. If such be the fact, it should perhaps be ascribed to peculiar local causes, especially as further observations have afforded no countenance to his opinions.

As a prophylactick against that terrible scourge the small pox, the virtues of the vaccine disease are now happily and extensively known.

Origin of Vaccination.—Dr. Jenner has the inestimable honor of introducing this operation to the notice of the world; but long before his time, it had been known by agriculturists in some parts of England, that an infection in the hands and about the joints of the fingers received from a cow laboring under what is now called vaccina, would confer an immunity against the small pox. Benjamin Jesty, a farmer of Downbay, in the isle of Purbeek, so early as the year 1774, inoculated himself, wife, and two sons, with virus taken from the pustules on a cow's udders, suffering with the vaccine disease. He did this, to protect himself and family from the attack of small pox, at that time prevalent in the vicinity. The operation was perfectly successful.* But the prophylactick power of the vaccine disease had not only been previously known in the dairy counties of England, but also in different parts of Europe, and, if we may rely upon the testimony of Humboldt, even in several districts of South America. It has been attempted, unsuccessfully as we think, to prove that the first suggestion of the expediency of inoculation with vaccine virus, was made by a native of France to an English physician, and by him communicated to Dr. Jenner. But from whatever source this gentleman may have derived the notion of vaccination, to him alone must be awarded the honor of its first introduction to general notice. Successful experiments were performed by him with vaccine matter, so early as the year 1796, but the result of his enquiries was not, until two years after, announced to the public. From that period on, the knowledge of the virtues of vaccination spread rapidly throughout Europe and this country, and there is now no civilized people on earth, amongst whom its blessings have not been realized and gratefully acknowledged.

Prophylactick power.—For a while the prophylactick power of vaccination was generally thought to be complete and

* Edinburgh Journal, vol. 1st, p. 513.

universal, and whoever presumed to hint doubts of its efficacy in any case, was sure to meet with the indignation or contempt of the profession. Since then the general sentiment has undergone a considerable change. From some cause or other, as yet unrevealed, so many well-attested cases of failure in the preventive power of vaccination have taken place, and so remarkable of late years has been the progressive increase of such cases, that the vaccine disease is no longer considered by practitioners a sufficient safeguard in every case from the variolous contagion. "This circumstance," says Dr. Gregory, "cannot be met by a reference to the fact, that small-pox once gone through does not always protect the subject from a second attack." Cases of variola after vaccination are far more frequent than second attacks of that disease. Dr. Gregory has given a table of the total number of admissions into the small-pox hospital, in ten different years. From this statement it appears, that in the year 1810, the proportion of cases of small-pox after vaccination to the whole number of admissions, was as 1 to 30, while in 1815, it was as 1 to 17; in 1821 as 1 to 4; and during the year 1823, as 1 to 3½. We may remark, however, that as this is the register of a *single* hospital, certain *local* circumstances may have occasioned the augmenting ratio of cases: no *general* conclusion can therefore be legitimately drawn from the facts set forth. The statement, moreover, may be inexact, seeing there could be no infallible method of determining whether the vaccination had been genuine and produced its constitutional effects.

Notwithstanding these facts, vaccination must still be regarded as an invaluable means for lessening the amount of mortality, and as deserving all confidence as a protecting power against small-pox. For although it may not, in many cases, render the system wholly insusceptible to the variolous infection, yet the number of instances in which it affords *perfect* immunity from small-pox, is beyond all comparison greater than that in which it fails to afford complete protection; and even where it does not entirely subdue the susceptibility to the small-pox, it almost invariably lessens it to such a degree, as to render this latter disease so mild and simple, as in most instances scarcely to require any remediate attention.

By many it is believed, that the constitutional influence of the

vaccine virus gradually wears out, until the system regains its original susceptibility to the contagion of small-pox. In opposition to this hypothesis it is remarked, that variolous cases occur with nearly equal frequency at all periods after vaccination,—as many indeed being met with at one year, as at five, ten or fifteen years subsequently to that operation. The results of experience however, are favorable to the hypothesis. Some have limited the vaccine impression to ten years. Dr. Brown has inferred from his observations, that immediately after vaccination, the antivariolous influence of the virus is nearly perfect; that in about three years afterward, the created insusceptibility is so much diminished, as readily to allow the operation of the variolous contagion; although the disease then occurring will appear in a mitigated form; that at the period of five or six years, hardly any security from small-pox is enjoyed, and so diminished is the influence of the vaccine virus, that if variola do occur, it will very nearly approach in severity to the natural disease; lastly, that the constitutional influence of vaccina cannot be depended upon any longer than six years from the period of vaccination. Dr. Leo Woolff, in an interesting memoir on this subject, has adduced facts and reasonings to show, that the vaccine influence is effaced by the constitutional changes that take place at the period of puberty. That the prophylactic power of vaccination progressively diminishes, until it is perhaps entirely worn out, I am myself much inclined to believe, from facts that have come under my own observation. But the attempt to determine its gradual subsidence by any accurate, fixed periods, must necessarily be an almost impracticable task; since it may well be supposed, that idiosyncrasies, modes of living, accidental as well as innate predispositions, and perhaps habitual extraneous agencies, may occasion many variations in this respect. The general fact or possibility of the gradual effacement of the constitutional influence of vaccina, should admonish us of the propriety of re-vaccinating, in order to renew the prophylactic impression. This practice is certainly rational, and cannot be detrimental, as a precautionary measure.

The manner of Vaccinating.—Vaccination has been performed in three ways—by blistering, incision, and puncture. The

first, being apt to create an irritation detrimental to the vaccination, and the second, endangering the washing away of the virus by the great flow of blood, are now generally superseded by the method of puncture. The spot usually selected for the operation is at the lower insertion of the deltoid muscle. The posterior part of the arm of the person to be vaccinated, is to be firmly grasped with one hand, while with the other, the lancet, at whose point is a tangible drop of the virus, is to be inserted a few lines, from above, downwards. It should be continued a few moments in the puncture, and its point pressed against the lower surface of the wound. It is expedient to make several punctures, merely that the chances of a successful operation may be increased.

The character of genuine Virus.—The vaccine lymph, up to the time when it begins to desiccate, is a limpid, viscous liquid, colorless, inodorous, and of a salt, acrid taste. Exposed on a smooth, flat surface, it dries rapidly, but without losing its transparency. Chemical observation has taught us, that it is decomposed and rendered inert by the action of light and heat; and that even at the ordinary temperature, the continued influence of the atmosphere greatly impairs its virtues. To obtain the virus, the edges of the pustule must be punctured in several points. The lymph will then ooze out, and may be collected and preserved between glass plates. Jenner recommends that it should be taken just before the appearance of the areola. He thinks its virtues diminished after the manifestation of the efflorescence, and always, if possible, avoided collecting it beyond the eighth day. Of late years, and especially in this country, vaccination is most commonly performed from the scab. The virus may be preserved longer uninjured, in the form of scab, than in any other mode. Matter of six or even ten months old, if kept in this way, will readily communicate the infection. No scab, except from a perfect pustule, should be taken. It ought to be smooth, of a dark-brown, or mahogany color, and rather brittle than tenacious in its texture. When used, the margin, which is of a lighter hue than the rest, should be removed with a knife, and a portion of the remaining dark, hard, internal part reduced to powder on a glass, and moistened or dissolved in a little cold water.

In whatever way the virus be procured, we ought carefully to examine whether the person, from whom it is taken, be in a healthy state; whether he may not be the subject of some cutaneous affection, or a vicious constitutional taint. Carelessness on this point may result in incalculable injury. I have several times known obstinate and alarming cutaneous distempers communicated to children by vaccination with virus from an unhealthy person. Unprofessional people have a notion, that various troublesome eruptions are occasioned by the vaccine disease; and it is somewhat sanctioned by enlightened observation. Accidents of this kind, however, may for the most part be charged upon that carelessness, of which we have just spoken.

The condition of the person to be vaccinated.—Age generally would seem to have little or no influence on the success of this operation. Certain idiosyncrasies are occasionally met with in persons of every age, counteracting completely the action of the virus; and sometimes cases occur, in which several successive operations are requisite, before success is obtained. Vaccination is commonly performed in childhood; but, as a general rule, it should not be attempted in children under six weeks old. The constitutional disturbance, occasioned by the agency of the virus, is more considerable in mature years, than early life. The existence of disease does not generally contra-indicate the propriety of the operation, if we except herpetic eruptions and some other cutaneous disorders. Nor does dentition nor pregnancy constitute any valid objection to its performance, provided there be no severe derangement of the nervous system.

As to the season for vaccination, it appears to be equally successful throughout the year. It would seem, however, that the course of vaccina is retarded by cold and hastened by hot weather.

The fact, that important varieties and modifications of the vaccine disease are occasioned by the existence of certain cutaneous affections, is well established, and merits particular attention. Dr. James, in a paper published in the sixty-sixth number of the London Medical and Surgical Journal, states that a single serous blotch on the skin, during the progress of the vaccine vesicle,

may cause such irregularity, and deviation from the natural course and character of the disease, that it cannot be depended on as a prophylactic against the variolous infection. In a letter addressed by him to the medical profession generally, in April, 1821, he observes—"I have observed abrasion of the cuticle produce the same effect,—such, for example, as we find in the nurseries of the opulent, as well as in the cottages of the poor, behind the ears and on many other parts, where the cuticle is tender. We find irregularity in the vaccine vesicle, if the skin is beset with herpetic blotches, or even simple serous oozings from an abraded cuticle. A speck behind the ear, that might be covered with a split pea, is capable of disordering the progress of the vaccine vesicle."

Test of vaccination.—The increasing number of failures in the protective power of vaccination, has by many been attributed, in great part, to an insufficient inoculation. It is, therefore highly important, to ascertain, in some way, whether the constitutional impression of the virus has been procured. Bryce's method of determining was, to re-vaccinate with matter from the pustule of the first vaccination, at the end of the fifth or beginning of the sixth day after the operation, between thirty six and forty eight hours before the appearance of the areola. If the disease be perfect, a pustule will arise at the point of the second insertion, but it will become accelerated in its course, so that about the second or third day from its coming forth, it will be surrounded with an areola, increasing and fading away, pari passu, with that of the first pustule. If, on the contrary, the first disease be not sufficient, the irruption from the second insertion will pursue its regular course as in other cases. This is now to be regarded as the primary disease, and the same method of re-vaccination is to be practised, with matter from its pustule,—and so on, until a perfect affection shall be induced. Others have proposed to re-vaccinate about twelve days after the operation. If this has been sufficient, the second vaccination will either not succeed at all, or give rise only to a spurious or an irregular pock. But the most *certain* test is inoculation with small-pox matter,—a test, from which we derive at once our reliance on the general protective power of the disease, and on its efficacy in the particular case.

A distinct, circular, radiated, punctulated, and not very large cicatrix is a pretty certain indication, that the vaccine affection was perfect. When the scar "is large, and bears the marks of having been formed by high local inflammation, and wants the distinctive character just mentioned," there is much reason to apprehend, that the system has not been secured against secondary variolous disease.

CHAPTER XXXV.

MODIFIED SMALL POX.

Sect. 1. *Varioloid Disease.*

The term, varioloid, is applied to certain forms of eruptive disease, resembling small pox in their general character, and supposed to originate from the variolous contagion. We find irregular forms of variola, described in the earlier writers, under the names of vesicular, pustular, spurious small pox; swine pox, sheep-pox, stone-pox, horn-pox, &c. They were developed both in persons who had been affected with the genuine disease, and in those who had never suffered from it, and were all referred to some irregular action of the small pox virus.

The introduction of inoculation first, and after it of vaccination, seems to have influenced these anomalous affections in no other way, than by increasing the frequency of their occurrence. Soon after the epoch of vaccination, spurious eruptions of this sort were more particularly observed. A few believed them to possess a specific character, and to arise from a peculiar contagion; a majority regarded them as chicken pox; whilst a third

class deemed them nothing more, than the result of variolous contagion, acting upon systems *partially* protected by the vaccine disease. During the last fifteen years, varioloid distempers have been on the increase. In various countries, they have frequently within this period, prevailed in extensive epidemics,—affording, by the way, a strong presumptive proof of the gradual obliteration of the vaccine impression from the system.

As mentioned above, three opinions have been held with regard to the nature and origin of this disease, some identifying it with varicella, a few contending for its specific nature and peculiar origin, and others asserting it to be an imperfect result of the variolous influence. The last opinion is the one now generally adopted by the profession, and its correctness is sufficiently evinced by the two following proofs: 1. The varioloid disease is known to have arisen directly and exclusively from the contagion of variola; and inoculation with small pox virus has produced it in its full character, in persons who had been perfectly vaccinated. I, myself, have produced a well-marked varioloid eruption, by inoculating with variolous matter, an individual who had been satisfactorily vaccinated about ten years before: 2. The varioloid does sometimes produce genuine small pox in the unprotected. Two striking examples of this sort I have myself witnessed, and the testimony on this point is abundant and unequivocal. That the disease when acting upon the constitution of persons, who have never undergone the vaccine or variolous infection, does *generally* reproduce itself in its characteristic form, and not occasion true variola, detracts nothing from the weight of the argument just offered: for it can hardly be doubted, that in a majority of varioloid cases, the small pox contagion is so modified or meliorated, as to be incapable of giving rise to the genuine affection, except where the susceptibility to its influence is extremely acute.

The works of several recent writers abound in observations, illustrative of the variolous origin of this disease. Dr. Thompson, particularly has adduced conclusive evidence on this point; and to his work, as also to my own chapter on varicella, I would refer the reader, who may wish to satisfy himself more fully upon the subject.

It is evident from what has been said, that small pox, both ca-

sual and inoculated, and the vaccine disease, are the principal agents that modify the action of variolous contagion, in such a manner as to give rise to varioloid. Independent, however, of these causes, we must not forget, that certain idiosyncrasies or peculiar atmospheric conditions may exert a similar modifying influence. As the degree and manner, in which these different causes operate, are extremely various, it is obvious that the irregular or varioloid affections, resulting from their action combined with that of small pox virus, must be correspondingly diverse. We accordingly find the diversity so great, that no description can be given of them, that can have more than a general application. I confine myself at present to that form of varioloid disease, resulting from small pox virus, modified by previous vaccination.

In many instances, as has been already stated, the vaccine affection entirely destroys the susceptibility to variolous contagion. The system, in other cases, is but *partially* protected by its influence; or if the susceptibility be temporarily taken away, in the lapse of years, it is again gradually acquired by the constitution. The disease that results from the action of small pox virus upon a system, thus *partially* deprived of its variolous suceptibility, and which of late years has become so common, deviates more or less conspicuously from regular variola; and is in a great measure divested of the dangerous character of the latter affection.

Small pox occurring a second time does not so often assume the varioloid character, as when it supervenes after vaccination. But it must be confessed, that its occurrence after vaccination is more common than after casual variola. This may in part be ascribed to some imperfection or disturbance of the vaccine affection, by which its prophlactick powers are impaired or destroyed. Dr. Jenner believed, that in every case where small-pox happens after vaccination, it is owing to an imperfection of the vaccine vesicle, occasioned by one or more of the following circumstances: 1. pre-occupation of the skin by some chronic cutaneous affection; 2. the use of spurious vaccine matter; 3. incautiously depriving the vaccine vesicle of its lymph, or otherwise injuring it by external violence, so as to give rise to common phlegmonous inflammation. Nevertheless, there can be no doubt

that modified small pox or a second variolous infection, resulting in a spurious form of the disease, may and often does occur after the most complete and satisfactory vaccination. It would seem from the observation of Dr. Gregory, that the aptitude to variolous infection after vaccination, prevails in an especial degree in some families. The same writer infers from facts which have come under his notice, that modified small pox after the vaccine disease is most apt to occur in persons between the ages of fifteen and twenty-one. My own observation though limited, fully sustains this inference: by far the greater number of varioloid cases I have yet seen, were in young persons of the age just mentioned. This accords with the opinion before noticed,—that the vaccine impression is gradually weakened or partially obliterated, during the constitutional changes that take place about puberty

The precursory symptoms of this affection are not generally severe. In a large majority of cases the eruptive fever is so mild and inconspicuous, as scarcely to attract attention. Sometimes however, its invasion is marked by as much intensity of febrile excitement, as happens in the severe forms of small pox. The succeeding eruption in these cases is not, as might be looked for, necessarily violent or extensive: but a small crop of little pustules, varying in number from one to twenty, may ensue, and dry up in the course of four or five days. The duration of this stage is no less irregular, terminating sometimes as early as the second day, and at others, not until the fifth day from its commencement. In all cases, whether of a mild or severe character, the eruptive fever completely subsides, so soon as the pustules appear; so that the patient no longer finds it necessary to keep his bed.

A transient uniform efflorescence precedes in many cases the eruption: a rash, resembling measles, is also not an unfrequent precursor. Sometimes the varioloid exantheme commences on the limbs; frequently it is developed at the same time on different parts of the body; but generally it makes its first appearance on the face. In the beginning, it almost invariably exhibits the form of small, firm elevated, red papulæ. These pursue different courses,—many of them drying off without undergoing any further change, while the remainder gradually assume the vesicular

or pustular form. The vesicular transformation is completed in the course of the first day; occasionally, not until the second. The vesicles are small, acuminated, filled with a limpid, watery fluid, and in many instances encircled by a faint red areola, so as to resemble in a certain degree the vaccine pock. They usually burst about the third or fourth day, or wither away—without assuming a pustular character, the fluid in them becoming whey-like in appearance. "This variety," says Dr. Thomson, "in the mildness of the eruptive fever; the strictly vesicular character, short duration and mode of disappearance of the eruption, corresponded (in the epidemic he described) so exactly with the descriptions usually given of the mildest varieties of *chicken pox*, as not to have been distinguishable from that disease."

In many cases, the vesicles become filled with a puruloid fluid, present a slight central indentation, and, by the third or fourth day, are converted into thin dark scabs. These separate and fall off usually about the sixth or seventh day after the appearance of the eruption, but sometimes not until the tenth or even twelfth day. Occasionally the vesicles remain distended with a colorless lymph for four or five days, and then become pustular containing a pus-like fluid. They usually continue in this state longer, before desiccation and scabbing commences. In some cases the scales being detached, are replaced, particularly on the face, by elevations in the form of warts, which disappear but slowly and by successive desquamations. (Cazenene.)

The quantity of eruption varies in different instances, from a single one to so great a number, as to cover the whole surface of the body. From the description just given of the course of the disease, it is evident, that papulæ, vesicles, pustules, and scabs, are frequently to be seen intermingled upon the same individual. Where the eruption is successive during several days, as sometimes happens, this appearance is still more conspicuous.

The complaint not unfrequently assumes so nearly the aspect and character of distinct small pox, that it is difficult to decide for the first five or six days, whether it should be regarded as a modified or regular variolous affection. In cases too, where the varioloid eruption is extremely abundant, it is quite possible to

mistake it sometimes for the confluent form of variola. Ver generally however, the smallness of the pustules, the whey-like appearance of their contents, and the early period at which desiccation and scabbing commence, will distinguish such cases from genuine small pox. Dr. Thompson observes, that the areola and its pustule sometimes exhibit a remarkable resemblance to the vesicle and areola of cow pox,—a resemblance that betrays the mixed variolous and vaccine character of the disease.

The duration of this complaint is from six to twelve days, and its termination almost always favorable. Varioloid pustules very rarely leave any marks on the skin. When the scabs remain a long time they occasionally leave slight pits, but much more commonly, warts or fungoid elevations.

From the foregoing account, we perceive how extremely diverse are both the local and general phenomena of this affection. In one case it presents the characteristics of varicella, in another, it can hardly be distinguished from small pox, and in a third it bears a striking resemblance to the vaccine pustule. It differs chiefly from genuine small pox, in its general mildness, its strong tendency to a favorable termination, and in the briefness and irregularity of its course.

Diagnosis.—The following circumstances may be stated, as its common and characteristic features:

1. The eruption comes forth in successive clusters, at uncertain periods between the second and fifth day.

2. The eruption rarely, if ever, enters into complete suppuration, as happens in small pox.

3. The eruption is unaccompanied by fever, except in very violent cases.

4. Desiccation or scabbing invariably occurs much earlier than in regular variola. It commences generally on the fifth or sixth day, and the scabs usually separate by the eighth or ninth day, leaving red disks or tuberculous elevations instead of depression.

Treatment.—In the milder cases of varioloid affections, little or no remedial treatment is necessary. In all instances, however,

it will be proper to exhibit a mild purgative in the commencement of the disease, and throughout the febrile stage, the diet and drink ought to be simple, unirritating and cooling. When the irruptive fever is very high, the abstraction of a few ounces of blood will be beneficial. In general, however, the febrile reaction may be sufficiently restrained, by free ventilation, cool drinks, refrigerant diaphoretics, laxatives and rest. Where, in short, the disease is so severe as to demand any medical attention, the treatment is to be conducted on the same plan that is proper in simple small-pox.

Sec. 2. Varicella. Chicken-pox.

There is, perhaps, no subject in medicine, that has given rise to greater diversities of opinion, than the disease termed *Varicella.* From the first notice of its existence to the present time, there seems to have been no fixed, general sentiment, with regard to its origin or pathognomic symptoms. The earliest records of variola inform us of the occurrence of various exanthematous affections, coincident with the prevalence of small-pox, and analagous to it in character. These affections were at first generally believed to be mere varieties of spurious small-pox, and to derive their origin from variolous contagion. Rhazes, who wrote in the beginning of the tenth century, and has given us the first history of variola, speaks of certain spurious eruptions, of a varioloid character, whose occurrence in individuals afforded them no protection against epidemic small-pox. In the same uncertain style, we find several succeeding authors, describing such eruptions under the various names of *improper*, *bastard*, *lymphatic*, *crystalline pox*, &c. Viden Vidius, in the sixteenth century, thought himself justified in distinguishing them from small-pox, and he described them under the name of chrystalli. Subsequently, Sennertus noticed certain varieties of variola, eruptions of which instead of being pustular, were vesicular in character, and *dried off in the course of a few days.* Sheep-pox, horn-pox, and wind-pox, were also enumerated by him, and the two latter terms, he conjectured, designated the same affections as the *crystalli* of

earlier writers. Riverius speaks of these varioloid affections as common in his time, and introduces a description by Ingnassius, of the variety denominated *crystalli*. The eruption was similar in size and figure to that of variola, but consisted of limpid vesicles filled with a watery fluid, and desiccating on the third day without danger. Sydenham, in his description of an epidemic small-pox, alludes to a spurious variety, unconnected with the genuine disease, and inefficient in securing the constitution from variolous contagion. In the latter part of the seventeenth century, the term *chicken-pox*, a name in general use out of the profession, was first introduced into medicine by Morton. It was used by him to designate what he regarded as the most benignant form of variola; for it was his opinion, as well as that of the profession generally who had preceded him, that varicella was a mere variety of small-pox. Some, however, even at this period, believed it to be a disease *sui generis*—but all concurred in the opinion, that its occurrence never conferred an immunity from small-pox. In 1767, Dr. Heberden published his memoir* upon chicken-pox, in which he asserted the specific character of varicella, its identity with swine-pox, and its origin from a peculiar contagion, altogether distinct from that of small-pox. Very soon after this we have from Dr. Sims, an account of a certain eruptive disorder, which he termed chicken-pox. The description of the eruption as witnessed by him, differs somewhat from the characteristics of the disease as laid down by Dr. Heberden; but they both agree in regarding variola and varicella as radically distinct affections. This soon became the general sentiment of the profession, and so continued till within the last eighteen years, during which its validity has been strongly disputed by several ingenious writers. MM. Berard and de Lowit,† from observations on a small-pox epidemic during its prevalence at Montpelier, came to the conclusion, that variola and varicella, though differing in their outward manifestations, could ultimately be traced to the same contagious principle. Dr. Thomson‡ particularly, an able investigator of this subject, has in our opinion

* Transactions of the College of Physicians, vol. iv.

† Essai sur les Anomalies de la Variole et de la Varicella.

‡ An Account of the Varioloid Epidemic, &c. By John Thomson, M. D.

adduced abundant and conclusive evidence to prove, that the various forms of chicken-pox, corresponding to the diverse descriptions of the older and more recent writers, may be correctly referred, for their source, to variolous contagion.

This view of the subject throws some light upon those multiform and perplexing exanthematous distempers, that usually precede or accompany epidemic small-pox. We see the same morbific principle, modified in its action by different susceptibilities and peculiar circumstances, giving rise to a vast variety of anomalous eruptions, diverse indeed in many particulars, but of sufficient similitude, on the whole, to point out their family alliance and origin.

The plan of this work renders it inexpedient to enter into a full review of the merits of this question: a brief notice may suffice.

In favor of the common origin of the two diseases, it is asserted, 1st. That variolous and varicellous epidemics never exist separately and independently; 2dly. that the two affections mutually give rise to each other; 3dly, that varicella seldom occurs in individuals, who have undergone neither the vaccine nor variolous complaint. In objection to these observations the principal arguments are the following:

1. Epidemic small-pox, it is asserted, often rages, without being attended by varicella, and varicella occasionally prevails without the concomitance of small-pox. This, I am inclined to believe, is an unfounded assertion. So far as my enquiries extend, every variolous epidemic, described with any particularity, has been preceded, accompanied, or immediately followed, by variola or varioloid affections, exhibiting the characteristic marks of varicella. Dr. Mohl,* it is true, asserts, that from the year 1809 to 1823, small-pox was entirely absent from Copenhagen, whilst cases of chicken-pox were met with every year. But the same author does not deny, that subsequently to this during the prevalence of a small-pox epidemic in that city, varicellous affections were constantly present. After all, allowing the objection to be true, it does not therefore follow that those affections are rad-

* De varioloidibus et varicellis. Scripsit Nic Christianus Mohl, &c.

ically distinct. It is well known that, at different periods, small-pox assumes very dissimilar appearances. Some epidemics are mild, some severe, and others malignant to a great degree: sometimes the pustules become filled with a bloody matter, and at others they are crystalline. These differences, exhibited by variola at different periods, are scarcely less remarkable than those subsisting between it and varicella. These result, it is probable, from accidental peculiarities in the action of the variolous poison, or in the susceptibility of the human system, occasioned by unknown causes. It is not, therefore, an irrational supposition, that certain atmospheric conditions, or other circumstances as yet undiscovered, may so modify the human susceptibility, or variolous contagion, over large districts of country, that a spurious or varicellous affection may be the prevailing epidemic.

2. During the prevalence of a small-pox epidemic, it is exceedingly difficult to ascertain, whether it be true that varicella may give rise to variola, and this to varicella. Dr. Thompson, however, who had abundant opportunities for observation, in the varioloid epidemic that occurred in Edinburg, asserts, that the varicelloid cases, with the exception of one whose origin was not traced, all occurred in situations, where they could be referred to the agency of variolous contagion alone; and that where varicelloid cases occurred, small-pox afterwards appeared precisely at the period it ought to appear, on the supposition that varicella may give rise to small-pox. It is stated by Dr. Mohl, indeed, that he never saw chicken-pox occurring in families. where variola prevailed; but at the same time he adds, that in such circumstances, he observed twice or thrice the occurrence of an eruption resembling varicella. We all know the difficulty of drawing an accurate diagnosis in such cases, and we may reasonably conclude that the eruption was really variolous. In confirmation of Dr. Thompson's observation, Dr. Luders affirms, that variolous contagion does sometimes give rise to chicken-pox. One of the cases he mentions seems quite conclusive. The circumstances were of such a nature, that it was quite impossible to suppose the operation of any other contagion than that of small pox, and yet varicella was produced.

Unvaccinated persons, who have never had the small pox, are liable to attacks of varicella, a proof it is affirmed that this affection is not a mere form of modified small pox. In answer to this we may observe, that it is generally conceded that chicken pox is of far more frequent occurrence after variola or vaccina, than where neither of these has been undergone. Drs. Bryce and Abercrombie saw but three cases in which the vaccine disease or varicella took place in persons, who had not experienced either vaccine disease or variola. But admitting such an occurrence to be more frequent than correct observation warrants us to believe, it could have little influence upon the argument. The question is, not whether varicella be a form of small pox, modified by previous vaccination or variolation, but whether it be an *imperfect result* of variolous contagion. The vaccine disease and variola seem indeed to be more powerful agents in modifying the subsequent development of the variolous principle, than any other agents with which we are acquainted. But there can be no doubt, for reasons above mentioned, that other circumstances may in a manner we cannot now understand, exert the same kind of modifying influence upon the human system.

4. Again it is asserted that varicella is at present more prevalent than before the introduction of vaccination, although small pox was then of far more frequent occurrence. This only proves that there are now more systems insusceptible to the full action of the variolous contagion than formerly, and rather sustains the hypothesis of their identity.

5. The occurrence of small pox does not prevent or modify varicella. Of course it is not meant in this objection to affirm, that chicken pox happening now and then after small pox, would militate against the identity of the two diseases; else upon the same ground, the distinct character of secondary and primary variola might be established. The objection must mean, that the occurrence of small-pox *does not generally* prevent or modify the varicellous disease. Dr. Thompson, however, asserts, that out of one hundred and fifty-five persons, whom he saw pass through the small pox, not one was afterwards affected with the vesicular disease." This is the more conclusive, because "upon the supposition of a varicellous and variolous epidemic,

most, if not all of this number have been exposed to the influence of both contagions." By the way we may remark, that if this mode of augmentation be advisable, we must conclude that vaccina and variola are identical in nature, seeing they usually prevent and modify each other.

6. The vaccine disease may be communicated to a patient soon after his recovery from varicella, and it will pursue its regular course; which never occurs after variola. Few experiments have been made upon this point; and we are as yet not justified in asserting, that the result of vaccination after the vesicular disease will be uniformly of the same character, as that stated in the objection. It is, besides, well known that small-pox in frequent instances fails to take away the constitutional susceptibility to the infection of cow pox. Many cases are recorded on the best authority, where the insertion of the vaccine virus, subsequent to an attack of small pox, has produced all the phenomena of perfect vaccina. But even admitting the objection were sustained by general observation, it could be met on the supposition, that the vesicular disease being an *imperfect* result of variolous contagion, was incapable of conferring upon the system the same insusceptibility to the vaccine disease, as the fully developed small pox.

7. Varicella, it is maintained, is not communicable by inoculation. This would seem to be erroneous. Mr. Bryce, it is true, alleges that he found it impossible to communicate chicken pox by inoculation, but Heim asserts that it is more communicable than small pox. Dr. Thompson also gives conclusive evidence on this point, and we have the authority of Dr. Heberden, for believing it can be inoculated. For confirmation of the identity of the two diseases, we may introduce here the statement of Reil,* that variola, occurring after varicella, is much milder than where this disease has not been experienced, more especially if the varicellous affection has been severe. So that the occurrence of varicella, would seem to shield the constitution in a partial degree from the virulence of variolous contagion.

8. Small pox and chicken pox are essentially different in their

* Erkentnntniss und cur der Ficher. bd. 5. s. 386.

characters and eruptions. This fact will have very little weight when it is considered, how difficult it is to indicate the precise nature of exanthematous affections by the character of their eruptions, and what confusion has existed in particular, with regard to the specific appearance of varicella, and its diagnosis from small pox or varioloid, even amongst those who believe in its distinct nature. In view of these circumstances, and of the abundant evidence derivable from other sources, favoring the identity of these diseases, a mere difference in their external characters can hardly be considered a valid objection, especially as we find no less striking dissimilarities in certain varieties of genuine small pox.

Upon the hypothesis advocated, there would seem to be little difficulty in explaining satisfactorily, the occurrence of modified small pox with all its numerous diversities, whether of a varioloid or varicelloid character. Vaccination or variolation, we are aware, does by no means in all cases obliterate the constitutional predisposition to be affected by the variolous contagion. Even after the system has passed through the most perfect form of small pox, a second attack will in some instances ensue; and we cannot for a moment doubt that the same event may take place after vaccination, since it is unreasonable to believe, that the vaccine disease can be a more certain prophylactick against variolous contagion, than small pox itself. But facts, illustrative of both these positions are too abundant and conclusive to permit any longer a doubt concerning their truth. Now between that state of the system, induced by vaccine or small pox, which confers entire immunity from variolous contagion, and that state in which the susceptibility to its influence, is totally undiminished, numerous degrees of susceptibility undoubtedly take place according to the individual idiosyncracy, temperament and accidental concomitant influence: and perhaps also the variolous poison may differ in the degree of its virulence and exert its agency under diverse modifications. If, then, after vaccina or variola, the predisposition to the latter disease is not *entirely*, but only partially destroyed, ought we not to look for an imperfectly developed form of the disease, should a second infection take place—especially too, as in this instance the variolous contagion may have

been meliorated in its character? It is in this way, we believe, that varioloid affections occur in persons who have undergone the vaccine or variolous disease.

As to the occurrence of such affection in those who have never had either of these diseases, it may be observed, that the degrees of natural susceptibility in different individuals are correspondingly diverse. We see in the same family, into which this contagion is introduced, one individual affected so slightly as scarcely to require attention; another perhaps indisposed with only variolous fever, without any eruption; a third seized with a pretty severe attack of distinct small pox; and a fourth sinking under the most aggravated form of confluent variola. The presumption therefore is, that where small pox contagion acts upon a system naturally or accidentally insusceptible to the full influence of its powers, it will produce either an extremely mild variolous eruption, or an irregular modified one;—in other words, a varioloid or varicellous affection.

On a review of the whole argument, I am induced in common with many others, to regard varicella, together with varioloid, as spurious or modified small pox, or at least, as being referable for its ultimate source to genuine variolous contagion.

The initial stage of Varicella.—Varicella is generally ushered in by restlessness, thirst, loss of appetite, occasional pain in the epigastrium, increased heat of the surface and acceleration of the pulse. These symptoms may oocur in various grades of intensity; but, for the most part, they are by no means severe. In many cases the febrile excitement is scarcely observable; still it is occasionally almost as violent as in the severe varieties of small-pox, being attended with the same pain in the back, head and extremities as this latter affection. A severe cough and soreness of the throat are sometimes accompaniments of the initial fever, and during its continuance infants not unfrequently suffer from convulsions. This fever continues from one to three days, terminating generally on the appearance of the eruption, although in some instances prolonged two or three days after this period.

The eruption, which is vesicular in varicella, is often

preceded, for a few hours, by a general erethematous rash, as in small-pox, and is generally accompanied by a vexatious tingling or itching in the skin. It appears first on the breast and back, next on the face and scalp, and lastly on the extremities. An incidental eruption of pustules is sometimes observable among the vesicles. The varicellous vesicles generally come out in suc cession during three or four days, so that at the same time, some will be just appearing, some perfectly matured, others shrivelling, and a fourth set converted into scabs. They are sometimes closely approximated, though seldom confluent.

Varieties of the eruption.—The dissimilar forms assumed by the vesicles, in different cases, has given rise to a division of the disease into three varieties.

1st. *Lenticular.*—The eruption in this variety appears very early. It is characterized by small, red elevations, rather oblong in shape, and having a flat shining surface, in the centre of which is a minute transparent vesicle. The vesicle at the end of the second day, is somewhat enlarged, being now 1-10th of an inch in diameter, and is filled with a whitish lymph. The fluid assumes a pale yellowish or straw color on the third day. On the fourth, the vesicle is shrivelled, desiccation commences, and in two days more it is transformed into a thin brown crust. The scab falls off about the ninth or tenth day, leaving a red spot but no depression on the skin. Owing to the successive appearance of the vesicles, this variety is prolonged for two or three days.

2d. *Conoidal.*—In this form the vesicles come forth suddenly, surrounded by a slightly inflamed border. On the first day, they are acuminated and filled with a bright limpid serum. They are more distended on the second day, containing a very pale yellowish fluid, and the surrounding inflammation is more extensive. On the third day, many are shrivelled, but others remain entire, attended with considerable inflammation, and containing a purulent matter. These vesicles generally leave permanent cicatrices. Scabbing commences on the fourth day, some of the scabs assuming a dark brown, others a rounded, yellowish and transparent aspect. "A fresh eruption of vesicles usually takes place on the second and third days; and as each set has a similar

course, the whole duration of the eruptive stage in this species of varicella, is six days: the last-formed scabs, therefore, are not separated till the eleventh day.*"

Globate, or Swine-pox.—Swine-pox is characterized by large, *globose* vesicles, with irregular circular bases, and surrounded by an inflammatory areola. At first they contain a transparent fluid, which on the second day of the eruption becomes turbid, or assumes a whey-like appearance. On the succeeding day, they subside, or begin to shrivel, acquiring a yellowish hue, and some of them containing purulent matter. Small, thin, dark-colored scabs appear on the fourth day, and in the course of four or five days fall off, leaving small red marks, which soon disappear.

Diagnosis.—Believing, as we do, that varicella and varioloid originate from the same source, and in some instances approximate so nearly in character, as hardly to be distinguished apart, we can give but little credence to the assertion of some authors, that a diagnosis may be drawn, which shall be universally infallible. It may be well, however, to attend to the following diagnostic marks, which in the general will enable us to recognize varicella. 1. The eruptive fever is generally more severe in varioloid than in varicella: 2. In chicken-pox, the eruption is for the most part vesicular from the beginning; while in varioloid, it is always pustular, except in the vesicular form, where it is pustular for a day or more: 3. Tuberculous bases are not observable in varicellous vesicles, but in the varioloid eruption they are distinguishable from its commencement.

The varicellous pocks are, by some, believed never to present that central indentation, which frequently occurs in varioloid; but this is discredited by many accurate observers. Dr. Heim† has described a form of varicella, one of the characteristics of which is a slight depression in the centre of the pock. Berad de Hauit and other authors have mentioned the same appearance. If we may believe Dr. Luders, there is a difference in the seats of varicellous and varioloid eruptions—the former affecting the cel-

* Bateman: Practical Synopsis of Cutaneous Diseases.

† Die specielle Therapie nach den hinterlassenen Papieren des verstorbenen A. G. Richter: B. 2. p. 342.—1817.

lular tissue between the skin and cuticle, and the latter being situate in the true skin.

Varicella prevails more frequently in the beginning of the year, or vernal months. Like small-pox, it seldom occurs more than once in the same individual. Secondary fever is of rare occurrence. The scabs, on falling off, not unfrequently leave depressions in the skin; but the cicatrices differ considerably from those occasioned by variola. Heim, who regarded these affections as essentially distinct, has adduced this circumstance among others in favor of his views. The pits of varicella, he says, are whiter than the rest of the skin, and quite smooth or even; whilst those, left by variolous pustules, have the color of the surrounding skin, and are uneven, like the surface of an orange. The margin of the varicellous pit is smooth and rounded; that of the variolous pit, generally somewhat indented and angulated. Hairs never grow in the disks of the former, in those of the latter they do.

Remediate Treatment.—Varicella rarely requires any medicinal application. General aperients, tepid drinks, and an antiphlogistic diet, are the principal remedies necessary.

CHAPTER XXXVI.

RUBEOLA, MORBILLI,—MEASLES.

The term *rubeola* and *morbilli* are used as mere synonymia by the American, English and French practitioners; but the German writers universally employ them to designate two distinct diseases,—appropriating the latter term to the present affection, and the former to a different, though somewhat similar complaint (roethlen) described by Willan, under the name of roseola.

The contagiousness of measles has by some been denied. Among other circumstances, it is stated that the disease can never be traced from house to house, or from street to street, as may frequently be done in small pox and scarlatina; and that its first appearance is generally simultaneous in several individuals,—both of which facts are opposed to the notion of its being propagated by contagion. But this, together with every other argument of the kind is fully met by the well established truth, that the malady may be communicated by inoculation. Dr. Home succeeded in verifying this fact in a number of instances; and more recent experience has fully demonstrated the practicability of morbillious inoculation.*

The contagion of measles does not seem to be so active or powerful as that of small pox. During the greatest prevalence

*Vogel, Percival, Brown, Manro, and Tissot, recommended inoculation for measles; and Home and Horst practised it with success. Professor Sparanza, more lately, in an Epidemic that prevailed in the territory of Mantua, employed inoculation for measles with decided benefit. Six boys in the House of Industry, and afterwards he himself, were inoculated. A mild and regular morbillious affection was the result in all. Himself and others subsequently repeated the experiment with equal success. "A slight cut was made into one of the most vivid of the large blotches, with a lancet, the point of which was covered with the blood effused. With this, small incised punctures were made in the arm, and a proper bandage applied."—Edinburgh Med. and Surg. Journal, 1826. See also, Bibliotheca Italiana. Agosto, 1825.

of the disease, many individuals entirely escape infection, although exposed to its full influence; and it is no infrequent thing to find in the same family, a few affected and the rest totally unaffected by the malady. It is difficult to say at what period of its progress, measles become infectious. Many believe it incapable of communicating itself, until the appearance of the eruption; but it would seem, from a few well attested cases on record,* that the disease may acquire an infectious power in a day or two before this event.

Measles, like small-pox, rarely affect the same individual twice; and indeed a second attack of the former would seem to be less frequent than of the latter complaint.† After a careful observation of more than twenty years, Willan declares that he never met with a secondary attack of febrile rubeola, and I have myself witnessed but one unequivocal example of the kind. Home mentions a singular instance, in which enlargement of some of the lymphatic glands followed an attack of measles. About six months having elapsed, the glandular swelling subsided, and the patient became a second time affected with measles.‡

Measles rarely occur sporadically; but when they appear, as before mentioned, many individuals usually become affected with them at the same time. As in all other epidemic diseases, the general course and phenomena of this complaint are often strikingly modified; and systematic writers have therefore, divided it into several varieties, according to the regularity or irregularity of its symptoms, the nature of the attending fever, and the character and violence of the local affections with which it may be complicated.

According to the observations of some, *morbillious fever* may occur without any exanthematous affection.‖ It certainly is not uncommon during the prevalence of epidemic measles, to meet

* Edinburgh Med. and Sur. Journal, 1828.

† See Dr. Baillie's paper, in the transactions of a society for the improvement of Medical and Chirurgical Knowledge. Vol. iii.

‡ Medical Facts and Experiments. Richter, Specielle Therapie.

‖ Morton mentions a morbillious fever unattended by any exantheme; and De Haen asserts that cases of this kind frequently occur during the prevalence of epidemic measles.

with fevers, attended with the usual catarrhal symptoms of the malady, but unmarked by its peculiar eruptions. Richter observes that persons affected by these fevers, are generally exempt from the disease during the subsequent progress of the epidemic.

Sometimes the measly exantheme takes place without any fever. The German writers* describe this modification of the disease under the name of *false measles*, corresponding to the *rubeola sine catarrho* of Willan, and the *rubeola sine* febre, of others. It is characterized by a regular measly rash, without fever, catarrh, or ophthalmia. It does not take away the susceptibility of the system to a subsequent invasion of febrile rubeola. "An interval of many months, even two years, has been observed between this variety and the subsequent febrile rubeola; but the latter more frequently takes place about three or four days after the non-febrile eruption."—(Bateman.)

Peculiar atmospheric constitution evidently exerts considerable influence over this disease; for at one period, its symptoms will be so light as scarcely to require medical attention; at another, it will assume a highly aggravated form; in a third period, it may take place under every grade of violence, from the lightest to the most malignant; and in a fourth, it "will hold a middle course, between the mildest and most dangerous forms of the malady." (Armstrong.) On the whole, however, the regular and moderate cases are infinitely more frequent than the violent and malignant ones.

Measles appear likewise to be decidedly influenced in their character by constitutional habit or idiosyncrasy. Hence it is that we sometimes meet with the disease under all its grades of intensity, in children of the same family—several very remarkable examples of which have come under my own observation. In general, measles are apt to be more regular and mild during the warm and equable, than the cold and variable seasons.

The time, intervening between the first impression of the rubeolous contagion and the actual commencement of the resulting disease, varies from a few days to two and even three weeks; but

* Vogel, Standback, Bd. 3 p. 203, Metyger, wermischte Schriften, Bd. 2, p. 167.

the period of incubation, generally, is from five to seven days. In nearly all the cases inoculated by Home, the eruptive fever commenced about the seventh day from the insertion of the virus.

Symptoms of the Eruptive Fever.—The initial symptoms of this complaint do not differ from those, which usually mark the invasion of catarrhal fever. Transient flushes of heat, alternating with faint creeping chills; slight redness and tenderness of the eyes, with an increased secretion of tears; cough and sneezing, with a watery discharge from the nostrils, are generally among the first symptoms of the morbillious fever. Sometimes two or three days of febrile excitement elapse, before the supervention of catarrhal symptoms; but in all cases, these symptoms occur sooner or later, in a very manifest form, and may be placed among the specific phenomena of the disease. The cough in the beginning is dry and harsh, attended with oppressive breathing, and some degree of soreness in the fauces. Not unfrequently, some of the lymphatic glands about the neck, and along the margins of the eyelids, become tumefied and tender. The stomach is apt to become quite irritable about the third day, and sometimes earlier, occasioning considerable nausea and vomiting; and where the febrile symptoms are highly aggravated, slight delirium may ensue in the evening of the same day. The fever is in general a marked synocha, as indicated by the hot and dry skin, and the quick, frequent and hard pulse.

The exantheme, generally, makes its appearance between the third and fifth days. This event, in cases of a violent character, is sometimes preceded for a few hours by more or less coma; and in small children, convulsions are by no means uncommon at this period. The eruption comes out first on the forehead, chin, nose and cheeks, and then on the neck, breast, body and extremities successively. It consists of small, red spots, apparently papular, and resembling flea-bites. They soon enlarge, and, as their number increases, run into each other, forming larger patches of an irregular or semi-lunar shape;* whilst the

* Bateman.

skin in the intermediate spaces retains its natural color. Some of the measles on the first day exhibit a small vesicle in the centre (Cazenane.)

The eruption on the face, during the second day after its appearance, becomes completely developed, and, on the following day begins to fade away; whilst on the rest of the body it continues vividly red. The exantheme, on the face, may be felt slightly elevated above the surface of the skin; but on other parts this elevation is not perceptible. Severe cases are attended with tumefaction of the face, in some instances so great as almost to close the eyelids. The eruption is not confined to the surface of the body: red patches appear on the gums, spread over the mucous membrane of the mouth, extend to the tonsils and uvula, and, acccording to Frank, are visible on the tongue. Leutaud saw the measly exantheme in the œsophagus and upon the mucous membrane of the trachea, and even on the surface of the abdominal and thoracic viscera.* The eruption fades away over the body in the same progressive manner in which it came out; so that by the eighth day from the commencement of the fever, it begins to disappear from the back of the hands, where it is wont to remain longest. On the succeeding day, the exantheme acquires a faint yellowish hue. Desquamation now commences on the face, and is completed over the whole body by the tenth or eleventh day.

The appearance of the eruption occasions no remission of the fever; but, on the contrary, is commonly attended with a manifest aggravation of both the febrile and catarrhal symptoms. The subsidence of the eruption is, generally, marked by an amendment of all the symptoms; and for the most part, the fever disappears entirely by the time the rash has desquamated. Occasionally, however, both the fever and cough continue, and even become worse after the complete disappearance of the measly exantheme. It is observed by Dr. Heberden, that in violent cases there is sometimes a recurrence of the coma, after the rash has gone off.

During the subsidence of the eruption, the supervention of more or less diarrhœa is by no means infrequent; and when not

* Precis de Medee. p. 604.

violent, it almost always meliorates the general and local symptoms. Occasionally a copious diarrhœa comes on just before the appearance of the rash. As it tends to interfere with the regular course of the exantheme, and to occasion a retrocession, it should be considered as an unfavorable occurrence.

The period, at which the eruption takes place, is various. It is generally stated to be the fourth day; and for the most part this is correct. Nevertheless, it is important not to lose sight of the fact, that even when the disease is perfectly regular in its character and course, the exantheme sometimes comes out much earlier, and occasionally, later than the period just named. It is observed by Dr. Armstrong, that the rash does not uniformly or generally appear, on the fourth day from the first development of the reaction. "I have seen," he says, "the eruption come out at all times, between the first and the seventh days; though perhaps, the most common period is between the third and fourth days after the reaction.

The aspect, under which this disease has just been described is that which it generally assumes. It appears, however, occasionally, under various striking modifications, requiring corresponding modifications in the treatment. Sometimes it pursues its career, unmarked by any serious complications; in a majority of instances, it manifests a considerable tendency to inflammation, particularly of the eyes and respiratory organs; and occasionally, reaction is sluggish and difficult. Hence, according to Dr. Armstrong, we have three varieties or modifications of the disease,—the *simple*, the *inflammatory*, and the *congestive*. To these we may add the *typhous* and *gastric* modifications,—the first being characterized by a typhous state of the system, and the last by prominent symptoms of gastro-intestinal irritation.

Synochal fever of a high grade is the characteristic of *inflammatory** measles. The pulse is hard, vigorous and accelerated; the skin dry and very hot; cephalalgia is severe, attended frequently with considerable delirium through the night; the eyes are very red; the cough is harsh, violent and distressing, with

*Strictly speaking, every case of measles is inflammatory; but the general and local phlogistic phenomena often preponderate to such a degree, that such cases may with propriety be distinguished by the term *inflammatory*.

little or no expectoration, and the respiration oppressed and frequently painful. The exantheme for the most part appears early, and is usually of a vivid red. The diseases that are particularly apt to supervene in this variety, are cynanche trachealis, pleuritis, peripneumania with bloody expectoration, bronchitis, cerebral inflammation, and gastro-enteritis.

The malady in the *congestic* form is indicated by the ordinary symptoms of internal congestion. Reaction is tardy and imperfect, sometimes wholly deficient. The vital energies of the system are generally much depressed; there is pallor of the countenance; torpidity of the bowels; the pulse labors and is weak; the breathing slow and oppressed; the extremities are cold, and the features sunk and anxious. The eruption does not appear at all, or it comes out slowly on some parts of the body. If reaction be not induced, coma or stupor, and in some instances, convulsions ensue. Young children and persons of a relaxed, delicate habit of body, are peculiarly liable to this form of the complaint. Two cases of this kind were seen by Dr. Armstrong, in which the patients died comatose and convulsed. Autopic examination revealed in both cases great engorgement of the lungs.

The pecular symptoms of typhus fever, constitute the *typhus*, or as some have termed it, the *malignant* sort of measles. The pulse is generally weak and frequent, sometimes nearly natural; the skin possesses the true *calor mordax*, communicating a burning or acrid sensation to the hand, and on parts of it not occupied by the measly eruption, petechiæ appear. Colliguative hemorrhages, diarrhœa, and profuse sweats often occur, and the energies of the whole system seem to be sinking. It is a happy circumstance, that this variety of measles occurs so rarely, as it is always terribly malignant and fatal. Nevertheless it has occasionally prevailed as an epidemic. Sir William Watson has given us the history of a putrid morbillious epidemic; but it may be doubted whether the affection he describes, was really measles or scarlatina, as these diseases were believed by him to be essentially the same. Nevertheless, the portrait he gives of the complaint, answers more fully the peculiarities of rubeola than of scarlatina.*

*Watson.—Medical Observations and Inquiries. Vol. iv. p. 132

4. Gastro-intestinal irritation exerts a marked influence in some cases, giving rise to the *gastric modification* of measles. The attendant febrile symptoms are not very conspicuous, the pulse being small and feeble, though inordinately frequent. There is severe pain in the forehead; the tongue is brown; a sense of tension and fulness is often experienced in the epigastrium, or short cutting pains distress the bowels. Violent vomiting and purging sometimes occur before and immediately after the appearance of the rash, which is pale and often indistinct. The cough is short, tormenting, and almost incessant. In some instances, great difficulty of breathing and a sense of oppression in the chest will suddenly ensue, especially in young and irritable children. There is occasionally extreme restlessness, with much jactitation, dyspnœa and an anxious expression of countenance, particularly on assuming an erect attitude. (Dr. Armstrong.)

Sequelæ.—The tendency to irregular local determinations, observable throughout the whole course of measles, is more especially manifest during the periods of desquamation and convalescence. It is therefore a common remark that less is to be apprehended from the disease itself than from its sequelæ,—and the assertion is generally true, when made in reference to the ordinary or simple form of the complaint. Few, if any, diseases leave the system with so great a susceptibility to the hurtful ininfluence of cold or atmospheric vicissitudes; and hence chiefly the frequent supervention of inflammatory and other after affections during convalescence.

The most common sequelæ of measles are, pneumonia, bronchitis, croup, otitis, arachnitis, chronic ophthalmia, and rheumatism. The development of tubercular action is not an infrequent result of the disease in phthisical habits; and it is especially apt to bring forth latent disorders of the lymphatic system, and occasion local manifestations of scrofula, where there is a strumous diathesis. Hence an attack of it is often followed by scrophulous ophthalmia and tumors about the neck, with other distempers of like character. Porriginous eruptions on the head, and serous ulcerations behind the ears, also frequently occur; and in

some instances, induration of the mesenteric glands and marasmus. Among the occasional consequences, are herpes, boils on different parts of the body, discharges from the ears, and anasarcous swellings.

Diagnosis.—The diagnosis between rubeola and scarlatina is at times attended with much difficulty. Indeed until the time of Withering, in 1793, they were very generally undistinguished.* Nevertheless, the careful observer will always be able to draw a correct diagnosis between the two diseases, from the catarrhal symptoms accompanying measles, and the peculiarities of its eruption. The small vividly red spots, like fleabites; their union into irregular semilunar patches; and the natural color of the intermediate skin, distinguishes the rubeolous exantheme from the large, irregular, more uniform and raspberry colored efflorescence of scarlatina. In measles the rash is characterized by small red spots blending with each other, and displaying central points more vivid than the coalescing margin so as to give a maculated appearance to the skin. In the other affection the blush is more diffuse and uniform, and the eruption consists of innumerable minute red points united together, resembling much the redness of a *boiled lobster*. The difference in the general course and progress of the two affections is another diagnostic mark. The fourth day from the eruption of the fever, is the usual period of the manifestation of the measly rash. In scarlatina, the eruption generally comes out on the second, and not unfrequently on the first day. Lastly the catarrhal symptoms, so rarely absent in measles, can hardly fail to confirm the diagnosis.

Prognosis.—Measles, when uninterrupted in its regular progress and uncomplicated with internal inflammation, is not to be considered a dangerous malady. However violent in its simple character, provided it proceed regularly in its course, the hazard is generally but little. Percival calculated, that about one

* Bateman says, that the publication of Dr. Withering's Essay on *Scarlet Fever*—or rather the second edition of that work, in 1793—may be considered perhaps as the date of the correct diagnosis of this disease. Synopsis, p. 66.

out of fifty cases of rubeola terminated fatally; and of this proportion one half took place in subjects under two years old. Rubeolous epidemics, of terrible fatality have indeed been recorded.* Obstinate internal congestion, preventing febrile reaction, are greatly to be apprehended. The sudden retrocession of the rash, either spontaneously or from violent purging, the application of cold or any other cause, is hazardous. It is an alarming incident, when internal inflammation, particularly of the lungs, brain or trachea, supervenes. Laborious respiration, with a wheezing sound in the trachea, indicates much danger in infants. Amongst the most fearful symptoms, are petechiæ, great muscular prostration and colliguative hemorrhages. The disease is attended with imminent risk, when it attacks females in the latter period of pregnancy, or in the puerperal state. In general, nervous, debilitated, and delicate subjects have more reason to fear danger than persons of robust and healthy constitutions.

Treatment.—In relation to the treatment of this disease, Dr. Armstrong makes the following very important observation: "From an impartial consideration of the facts which have come before me, I am convinced that our plan of treating measles, (in its regular form) is too uniformly active when the eruptive fever is developed; and that we should be more fortunate in the main, if we interfered less with the operations of nature, in cases of a mild and regular character." The attention of the practitioner is particularlyly called to this remark. That it is true and highly important, I am thoroughly persuaded, both from my own experience, and my observation of the practice of others. An active and antiphlogistic treatment, where no internal local inflammations are present, is generally not only uncalled for, but decidedly injurious—even though considerable febrile excitement should mark the eruptive fever. The eruption in this, as in every other exanthematous affection, must be regarded as an effort of the system to relieve itself from the noxious influence of some internal irritation, by a critical or metastastic deposition on the sur-

* From the great fatality of these epidemics, the disease acquired its name *morbillus* or *little plague*. Were these epidemics measles? Both small pox and scarlatina were formerly confounded with measles.

face. Whatever materially interferes with the regular course of the precursory fever, tends to disturb the regular appearance and character of the eruption: but the development of this is essential to the safe and complete resolution of the disease: therefore, when the eruptive fever is regular, not very violent, and uncomplicated by internal inflammation or congestion, we should abstain from severe measures, and employ a gentle remediate treatment. All that is usually requisite in such cases is to keep the bowels in a soluble condition by the employment of mild laxatives; to direct the patient to make a free use of tepid diluent drinks; and in instances attended by a very moderate degree of febrile excitement, to prescribe some of the gently stimulating diaphoretic ptisans—such as, infusions of sage, elder blossoms, marjoram, balm, or eupatorium. A high grade of fever undoubtedly indicates the propriety of moderate venesection; and in this case the refrigerand diaphoretics should by no means be neglected, as they often suffice, without bleeding, to procure a proper reduction of the general excitement. Small doses of antimonial wine, with sweet spirits of nitre, the saline effervescent draught, and the ordinary nitrous powder may be employed for this purpose. The subjoined formula* is particularly suitable, but I have generally preferred the following mixture.†

When visceral inflammation, oppressive internal congestions or other irregular and alarming symptoms are associated with the disease, our remediate measures must be far more energetic.

After the initial stage of oppression, if no reaction should ensue and the face remain pale and sunken, the pulse feeble, and the

* ℞. Spirit mindereri, - - ʒvi
Spirit. nitri. dulc. - - ʒiiss
Vir. antimonii - - - ʒiss
Syrup lemonis - - - ℥ii
S. dose,—a teaspoonful or two every two hours.

† ℞. Muriatis ammoniæ - ʒiii
Pulv.Extract.Glycyrrhii ℥ss
Tart. Antimonii - - gr.i
Aq. fontanæ - - - ʒviii M.
Dose—a dessert spoonful every two hours for a child between two and five years of age.

breathing heavy, with great muscular prostration and torpidity of the sensorial powers, we must endeavor promptly and decisively to obviate the internal congestion, and arouse the action of the heart and arteries. If this be not effected, the eruption will not come out, and fatal stupor or coma will ensue. Dr. Armstrong, a strenuous advocate of venesection in the congestive form of fevers, recommends the moderate and exceedingly cautious abstraction of blood in congestive measles. Internal congestion however, appears to result from a previous loss of energy in the vital powers, and especially of the extreme vessels. It would therefore seem to be a more efficient and prudent method to impart warmth and vigor to the system, and to recall the circulation to the extreme vessels of the surface. Stimulating frictions to the skin with tincture of capsicum or flannels wrung out of hot brandy; sinapisms to the epigastrium; and bottles filled with hot water applied to different parts of the body and extremities, are the means best calculated to procure these ends. Measures of this kind expose the peculiar advantage of exciting the energies of the system without diminishing its resources, at the same time that they most efficiently tend to equalize the circulation and remove the congestion. In addition to the above means, we should not neglect the use of warm and gently stimulating drinks. In several instances of congestive measles I have employed camphor, suspended in a mucilaginous fluid with obvious benefit. The carbonate of ammonia, in my hands, has proved a very useful remedy in a few cases of this kind.*

The disease is not so much benefited, by the exhibition of either of these stimulants, where the congestive state precedes the exantheme, as when the rash, after appearing, suddenly recedes. In cases of this kind, oppressed respiration, a short, dry cough, a feeble and quick pulse, with an irregular distribution of the animal temperature—'some parts being cool or cold, while others

* ℞. Carbonatis ammon. - ʒii
Pulv. g. arab. - - - ℥iii
Sacch. albi. - - - - ℥ss
Aq. fontanæ - - - - ℥viii
Tinct. opii. - - - - gtt. xl
M. Ft. S. A teaspoonful or two every hour or two.

are preternaturally warm—and a death-like paleness of countenance,' indicate extreme danger; and unless prompt relief be obtained, "the patient sinks rapidly under an apparent load of phlegm in the bronchia." (Armstrong.) *Camphor* here is an exceedingly valuble remedy. Armstrong recommends in strong terms, a large dose of calomel, combined with camphor, antimonial powder, and a few drops of laudanum. A combination of opium and camphor is the appropriate remedy in cases of retrocession, occasioned by inordinate purging or vomiting; and in conjunction with this remedy, the use of sinapisms, stimulating friction, blisters, the warm bath, or dry warmth to the surface, may be deemed indispensable. We should remember, however, that except in very feeble subjects, moderate diarrhœa is rather beneficial than injurious; and we should by all means refrain from interfering with it, particularly in robust and plethoric individuals,—unless indeed there be evident symptoms of its hurtful influence upon the regular appearance and course of the rash. (Armstrong.)

Inflammatory measles require energetic antiphlogistic and depletory measures. Whatever difference of sentiment there may be touching the employment of the lancet in the simple form of rubeola, no one disputes its efficacy, when the malady becomes complicated with visceral inflammation. Prompt and decisive venesection, both generally and locally; epispastics over the region of the affected part; gentle laxatives and nauseating doses of the antimonials, are the principal measures on which we should rely. *Antimonial* emetics, especially in young children, have frequently an excellent effect, where bronchitis or peripneumonia have supervened. Whatever organ, in short, may become the focus of irritation, our measures should be adapted to the existing inflammation, without any other reference to the morbillious affection, than to the grade and character of the attendant fever.

Certain varieties *of inflammatory* measles have occasionally occurred in which venesection is reported not only to have effected no good, but to have been absolutely detrimental. Thus the very fatal rubeolous epidemic, that prevailed at Paris in 1828, although nearly always complicated with inflammation of impor-

tant organs, particularly of the lungs, was mitigated in no degree by sanguineous evacuations.* Opium and calomel might be useful in cases of this sort. I speak doubtfully, as I have never had an opportunity of witnessing such violent examples of the disease. Nevertheless I am induced unhesitatingly to recommend the combination in this variety of measles, from the experience I have had of its excellent effect in pneumonia typhoides. Blisters. cupping and the warm bath may be regarded as indispensable in such cases.

In the remediate management of measles, vicissitudes of temperature must be especially guarded against. An *equable* temperature, and one neither productive of chilliness, nor much warmth, should be preserved. When the eruptive fever is very moderate, and the patient is of a feeble and irritable habit, the air of the sick chamber ought to be so regulated, as to communicate a sensation of warmth; and this is particularly requisite in congestive cases.

I have already adverted to the many disagreeable and dangerous sequelæ of measles and their frequent dependence on injudicious exposure to cold during convalescence. Common sense, therefore, dictates that the patient should during this period remain within doors, and avoid in every way the noxious influence of a cold and damp atmosphere. "Even in summer, convalescents should not be suffered to go out of doors except in the middle of fine days, and not without additional apparel." (Armstrong.)

Stimulating drinks of whatever kind should be positively inhibited, during the subsidence of the disease and the period of convalescence, and the diet must be light and unirritating.

There is occasionally dryness of the skin and a slightly febrile pulse after the appearance of the rash. Gentle diaphoretic febrifuges are the suitable remedies in these cases, and it will often be expedient to continue their exhibition during convalescence. An excellent diaphoretic of this kind is the spirits mindereri, in union with a small portion of sweet spirits of nitre and of antimonial wine. When pectoral symptoms continue troublesome at this stage of the complaint, the *muriate of ammonia* with vinegar

* See Biett's Report, in the Journal Hebdomadaire, No. XLII.

of squills and antimony, is one of our most efficient remedies.*

Tonics are almost invariably injurious in convalescence from measles. If the system is left in an exhausted but unirritated condition, a weak infusion of serpentaria may be given; and this with mild and nourishing diet, will soon restore health and vigor to the debilitated frame.

The following observation, by Dr. Armstrong, shall conclude what I have to say on this subject: "It is a remarkable fact, that when any cutaneous affections arise after measles, the internal organs generally remain free from disease; and even where some internal disorder has existed, I have not unfrequently seen it disappear, on the occurrence of some spontaneous eruption of the skin. Indeed there are many cases of this nature on record. At all times, we should, therefore, be most wary in meddling with vesicles, pustules, boils and the like, when they come out after the measles; for although they may be temporary blemishes on the surface, they are often the occasion of saving the vital works within.

* ℞.	Muriat ammoni. - -	ʒiii	
	P. extract. glycyrrh. -	℥ss	
	Aq. fontanæ - - -	℥vii	
	Acid. Scillæ - - -	℥ss	
	Vin. Antimon. - - -	ʒi	M.

S. Dose—A tablespoonful every four hours for an adult.

CHAPTER XXXVII.

SCARLATINA. SCARLET FEVER.

SCARLATINA is characterized by *fever*, a peculiar *exantheme*, and *inflammation in the fauces*—rapidly terminating, in some cases, in ulceration and sloughing.

General Observations.—Scarlet fever arises from a specific contagious miasma; but certain circumstances, it is possible, may concur in such a way as to generate the affection independently of contagion. "There is abundant evidence that fever attended with scarlet eruption, and possessing all the other characters of this disease, does occasionally arise from exposure to cold."(Gregory.) The period of the greatest activity of the contagious virus, is said to be the stage of desquamation. (Cazenane.) From three to five or six days usually intervene between its first impression, and the manifest development of the resulting disease.

As in small-pox and measles, one attack of scarlatina secures the system against a subsequent invasion. On this point there has been some diversity of opinion. Withering and Willan never witnessed a second attack of the disease, and they deny the possibility of its occurrence: Bateman, too, observes, "that this fact is now fully ascertained." On the other hand, Bicker,* Neuman,† Burns, and other authorities equally respectable, deny that the susceptibility of the system is invariably taken away by one attack; and they adduce some examples in confirmation of their opinion. It is also observed by Richter, that cases of a second, nay even a third attack of scarlatina have been noticed.‡

* Beschreibung eines Scharlachfiebers.—Rotterdam, in 1778, and 1779, p. 162.

† Aufsatze and Beobachtungen fur Aerzte, p. 284, as quoted by Reid. Soc. cit. t. v. 136.

‡ Specielle Therapie, b. d. ii. p. 440.

The activity of the contagious principle may be influenced by various circumstances; such as constitutional idiosyncrasies, age, sex, climate, accidental predisposition, and peculiar atmospheric temperament. Certain individuals are entirely insusceptible to the contagion, never becoming affected with the disease, though fully exposed to its cause. Females, it is said, (Reid, Richter, Steiglitz,) are more susceptible than males; and it is the voice of general experience, that nurslings and old persons are much less liable to the disease than individuals of the intermediate ages. Some epidemics expend nearly all their violence on children; adults and adolescents are principally visited by others. Reid witnessed a malignant epidemic scarlatina, that was almost entirely confined to persons between the ages of fifteen and twenty five. The disease prevails at all seasons; but warm, humid weather, and the air of low marshy districts, would seem to promote its dissemination, and aggravate its violence. Certain peculiarities of atmospheric constitution, hitherto unrevealed, appear to exert considerable influence over the intensity of the contagion; as is manifest from the occasional prevalence of the disease in epidemics, and the different grades of severity and many varieties of character these have assumed. Great irregularity at times marks the progress of the epidemic. After raging extensively with much violence, it may suddenly abate so as almost to disappear, and then resume its power, and prevail with more malignity than ever. The contagion seems occasionally to linger for several years in a certain district, affecting from time to time only a few individuals.

Scarlatina may appear in so simple and gentle a character, as to require nothing but the mildest remediate management; or in a form so severe and malignant, that the promptest and most energetic measures will scarce mitigate its violence. Between these two extremes it occurs under every grade of severity. According to the differences of intensity and character, in relation to the fever, exantheme, and inflammation in the fauces, the disease has been divided into three varieties,—*s. simplex*, *s. sanguina*, *s, maligna*.

Symptoms of S. Simplex.—A period, varying from one to three

or four days, usually intervenes between the manifestations of the ordinary premonitory symptoms of febrile diseases, and the commencement of the eruptive fever. At the end of this time, slight chills come on, alternating with transient flushes of heat. The patient complains of depression, nausea, pain in the loins, lower extremities and head; has a hot and dry skin, and a frequent quick pulse. Forty eight hours usually elapse from the commencement of the fever before the appearance of the eruption. This comes out, first on the face, then successively on the neck, trunk and extremities, and finally spreads over the surface of the mouth, fauces and nostrils: in some instances it is visible even on the albuginea. It consists of innumerable red points, which coalescing with each other, give a continuous and diffuse blush to the skin, not unlike the shell of a boiled lobster. (Armstrong.) In some cases, there is a uniform diffusion of the scarlet efflorescence over the whole body; in others, large irregular patches appear, leaving the intervening skin of the natural hue. There is commonly some enlargement of the miliary glands and papillæ of the skin, whereby the surface, particularly of the breast and extremities, acquires a slight roughness to the touch. On pressure with the point of a finger, the redness vanishes for a moment, leaving a transient spot of white.

Coincident with the irruption of the fever, or soon after, the voice becomes thick and less sonorous, and the patient experiences some difficulty in swallowing, together with slight soreness of the fauces. The edges and extremities of the tongue are usually red, while a thick white fur covers the rest of the surface, through which the scarlet points of the enlarged papillæ are visible. In most instances the face becomes somewhat swollen; the skin is hot, and the pulse frequent, quick, sometimes tense and vigorous. The thirst is not commonly troublesome, but the appetite is always impaired. The evening exacerbations are attended with considerable restlessness and occasionally slight delirium, both of which generally disappear on the approach of morning.

On the fourth day, the full developement of the fever and eruption is gradually accomplished, and their stage of declination commences on the day following. They continue to decline,

pari passu, till almost the end of the seventh day, when there is an entire disappearance of both. When the eruption is about subsiding, the tenderness of the fauces abates; cutaneous transpiration is re-established; there is a copious reddish sediment in the urine, and diarrhœa often takes place. Desquamation commences on the eighth day. It is generally attended with considerable itching, and is followed by an unusual sensibility of the skin over the whole body. The appearance of the eruption is occasionally attended with a considerable abatement of the febrile symptoms. Sometimes the fever throughout the disease is so slight, as hardly to attract attention; at others so grave as to demand vigorous and decisive measures. It should be borne in mind, that, though the affection mav commence and continue for a day with great mildness, it may suddenly assume all the violent characteristics of the *anginose* variety.*

S. anginosa.—A higher grade of fever and a more severe anginose affection characterize this form of scarlatina. The forming stage is almost invariably attended with considerable headache, præcordial oppression, general muscular prostration, nausea and sometimes vomiting. A feeling of stiffness and dull pain in the muscles of the neck and under the ears and angles of the jaw, accompanies the fever from its commencement, and not infrequently precedes it. A red and slightly tumid appearance is presented by the fauces, palate, tonsils and uvula. The voice soon becomes hoarse, an unpleasant sense of constriction in the throat is felt in respiration, and deglutition is painful and difficult. There is a rapid development of febrile action, the pulse acquiring great quickness and frequency, but rarely

* In reference to cases of this nature Dr. Armstrong has the following observations: "Simple excitement may readily produce inflammation, and in fact is the most frequent cause of it; for if there be a latent weakness in any organ, the simple excitement, if not timely moderated, is sure to give rise to inflammation there. It is on this account that many diseases merely marked by simple excitement at the beginning, are complicated with inflammation in their progress; and hence it is, that apparently benign seizures of scarlitina may eventually become the cause and concomitants of serious affections of some of the viscera. It is, indeed, only in subjects of the soundest constitution, that we ever see simple excitement uncombinedly exist throughout the disease: and the only reason it so frequently occasions inflammation is, that some tissue or other had been secretly in fault before its occurrence.—*On Measles, Scarlatina*, &c. p. 157.

possessing the vigor, tension and fulness, by which it is marked in the simple variety of the disease. The skin is more intensely hot than in any other febrile affection, and there generally is very great thirst. According to Currie and Willan, the heat of the surface has risen to 108 and even 112 degrees of Fahrenheit's thermometer. The tongue becomes dry, its edges are very florid, and on its surface are seen the projecting points of the inflamed papillæ. Considerable uneasiness or pain is felt in the head, and the whole course of the disease is marked by much languor, restlessness and prostration.

In this variety, the eruption is not manifested so early as in simple scarlatina,—the third day of the fever being the common date of its appearance. It is scattered on different parts of the body, particularly about the elbows, in irregular, not very large patches, but is seldom diffused over the whole surface. Sometimes the rash disappears the day after it has come out, and "reappears partially at uncertain times, but without any corresponding changes in the general disorder; and the whole duration of the complaint is thus lengthened, and the desquamation is less regular." (Bateman.)

If the declension of the febrile symptoms takes place as early as the fourth or fifth day, the swelling and inflammation of the fauces generally pass off by resolution with the eruption and fever, without terminating in ulceration. But when, during the first three or four days the excitement is violent, or when it is protracted beyond the period just mentioned, small ulcers are formed about the tonsils and palate, which are rapidly converted into ash-colored, superficial sloughs, a considerable quantity of tenacious mucous is always secreted in the fauces, and concretes very frequently into white flakes, presenting the appearance of ulcers, where in reality there is none. The parts should therefore be carefully examined, before an opinion is expressed as to the existence of ulcers. (Armstrong.) With the subsidence of the fever, the sloughs in the throat separate, leaving red ulcerated surfaces, that usually cicatrize without difficulty. Occasionally, instead of separating about the eighth day, they enlarge, assume a brown color, and discharge an acrid sanious fluid. The glands about the neck, in such cases are hard, swollen and painful; and

harassing diarrhœa and tenesmus supervene. The inflammation may extend into the trachea, and death ensue under symptoms of acute bronchitis.

This form of the disease is not seldom complicated with visceral inflammation. During the eruptive stage, the brain is often deeply involved, and symptoms of severe and fatal coma are exhibited. Abdominal inflammation may likewise take place. "At first there are only slight pain and soreness in some part of the abdomen, with a quickened pulse and hurried respiration; but the pain and soreness gradually increase, and at length are attended with vomiting, eructation, fulness of the belly, and general restlessness. In six, seven, or eight days, the abdominal soreness and pain abate or disappear, while the pulse grows rapid and feeble, the breathing more anxious, and the vomiting more urgent. Cold, clammy sweats and a universal collapse now speedily supervene, and are the immediate precursors of death." (Armstrong.)

S. Maligna.—In the beginning, this variety of the disease may wear the aspect of scarlatina anginosa, but it speedily betrays its violent and dangerous character. The eruption comes out at uncertain periods between the second and fourth days. It is usually pale at first, but in the progress of the affection, it acquires generally a dark or livid hue. Great irregularity marks its duration; and it will often vanish soon after its first appearance, and at the end of two or three days reappear on different parts of the body. The pulse, active in the commencement, becomes small and feeble in the course of the second day. The heat of the skin is variable, but in general not very intense. At an early period, delirium usually comes on; and, with occasional intermissions and exacerbations, often continues throughout the subsequent course of the disease. In nearly all cases, there is considerable disturbance of the sensorial functions; and in aggravated examples, the eyes become dull and inflamed, and a livid flush overspreads the cheeks. A brown and dark fur covers the dry tongue and the breath is fetid. In the fauces, on the soft palate and tonsils, may be seen grey-colored sloughs, which soon acquire a brown and finally a dark color. Sometimes, before the ulcera-

tion becomes severe or extreme, death will take place under symptoms of cerebral oppression. "In general," says Dr. Armstrong, "it is only when the fever is protracted beyond the fourth day, that the ulcers are converted into ill-conditioned, black and fetid sloughs." A large quantity of very viscid mucus is generally secreted into the fauces, occasioning difficult respiration and a rattling noise in the throat. When the sloughs are extensive and foul, a thin, acrid fluid issues from the nostrils and gives rise to painful irritation and excoriation of the parts over which it flows.

Where the disease has assumed a particularly violent character collapse supervenes towards the middle or end of the second week. Great prostration of all the vital energies now ensues; the pulse becomes very frequent and feeble; the heat of the surface sinks; the tongue is dark, brown, or black; exhausting diarrhœa often takes place; and, in some cases, hemorrhages from various parts and petechiæ occur towards the fatal termination of the complaint. The fever and affection of the fauces may frequently exist without an eruption at any period of the disorder. As early as the second or third day, death sometimes closes the scene; and it is observed by Bateman, that occasionally the symptoms continue to be moderate till an advanced period, when they suddenly assume a malignant and rapidly fatal character.

Three modifications of *malignant* scarlatina have been described by Dr. Armstrong,—the *inflammatory*, *congestive*, and *mixed:* the latter being characterized at once by much internal congestion and a moderate reaction of the heart and arteries.

The *inflammatory* modification corresponds with the *putrid* variety of Richter.* Its commencement is marked by a high grade of inflammatory excitement, as indicated by the full, hard, and vigorous pulse, the intensely hot skin, and early delirium. For a day or two, it differs little in appearance from scarlatina anginosa, but the early supervention of collapse or a typhous state, and of the gangrenous condition of the throat mentioned above, soon reveal its true character. The eruption comes out early; at first vividly red, but as the disease advances, it acquires a

* Specielle Therapie, bd. ii. p. 466.

darker or purple hue. The animal powers speedily sink; a burning, acrid sensation is felt on touching the skin; the pulse becomes weak, small and hurried; the exantheme purplish, and petechiæ or a miliary eruption, coliquative diarrhœa and hæmorrhages ensue. The extreme violence of the anginose affection, and its decided early tendency to terminate in extensive gangrenous ulceration, are the principal characteristic phenomena of this modification. *Inflammatory* scarlatina maligna was formerly described under the name of putrid sore throat.

The want of reaction distinguishes the *congestive* variety. The patient is pale, faint, oppressed, and complains of universal prostration, giddiness, deep-seated pain, and a sense of weight in the head, nausea, much anxiety and oppression in the præcordia.—"There is often a mixture of lividity and paleness in the face, and the eyes are usually dull, acquiring a fatuous or inebriated expression in the course of the disease. The mind at first alarmed and confused or dejected, soon becomes disordered with delirium; an indifference to surrounding objects and a stupor succeed, under which patients frequently expire." Respiration may be quick and short, or slow and impeded; and the pulse is weak, sluggish, and irregular. The tongue, at first covered with a white fur, becomes rough and brown in the course of the disease. There is torpor of the bowels in the beginning, but in the latter period of fatal cases, diarrhœa nearly always supervenes, attended, not unfrequently, with petechiæ, gangrenous spots, and wasting hæmorrhages from the nose, mouth and bowels. The rash, from its first appearance, is pale or copper-colored, acquiring at last a purple hue. This modification of the disease is seldom protracted in its course, but very often terminates as early as the second, third or fourth day. The anginose affection is seldom extreme, and is supposed by Dr. Armstrong to have little to do in bringing about a fatal termination. The mortal tendency of the disease he ascribes chiefly to the "venous congestions of the brain, liver, spleen, lungs, and of the vessels of the heart, giving rise to universal collapse and visceral disorganization," and perhaps to a change in the constitution of the blood itself.

Diagnosis. Measles and miliary fever are the only two disea-

ses with which this affection is liable to be confounded; and it must be confessed, that a correct diagnosis between them and the simple and anginose varieties of scarlatina is at times attended with very considerable difficulty. No single symptom can be regarded as peculiar to scarlatina. The eruption is at times wholly or nearly absent, diffused in blotches, and occasionally papular. Irregularity also marks the anginose affection, which may vary from a slight redness to much tumefaction, and occur with or without ulceration and sloughing. Nevertheless, an accurate diagnosis may nearly always be framed, by a contemplation of the following circumstances. In scarlatina, the usual time for the appearance of the eruption is during the first forty eight hours of the fever: the rash, in measles rarely comes out until the third day, and most commonly not until the fourth. The exantheme, in the former affection, consists of innumerable points, intermixed with small papulæ, dispersed over the cuticle,—resembling a diffuse erethematous blush. The rubeolous rash on the contrary, is made up of small circular dots, like flea-bites, of a more vivid red in the centre than circumference, so that their coalescence presents a less uniform blush than is displayed in scarlatina. These red and slightly elevated dots are generally congregated in clusters and patches, so as to exhibit an irregular *crescent shape.* "The crescent-like form of the patches of measles, and the more diffuse, and irregular shape of those of scarlatina, will be a material diagnostic guide." (Bateman.) In scarlatina, the eruption resembles in color the boiled lobster shell, and is generally of a lighter red than that of measles, which also is somewhat inclined to a brownish hue. The most striking diagnostic mark, however, is furnished by the catarrhal symptoms, so very conspicuous in nearly every case of measles, but either entirely absent, or extremely slight and partial in scarlatina. The inflamed eyes, copious weeping, red and tumefied edges of the eyelid, intolerance of light, coryza, sneezing, strong, harsh, and hoarse cough, so seldom absent in measles, and so rarely present in scarlet fever, will, in general obviate all danger of mistake. Finally, the ulceration and sloughing of the fauces in s. maligna and anginosa, are quite sufficient to distinguish this affection from rubeola.

Simple scarlatina, approaches very nearly, at times, to the cha-

racter of miliary fever, so that a superficial observer, might very easily be led into error. They may be distinguished, by the miliary eruption being almost universally attended with considerable perspiration, which is not the case in the appearance of the scarlatina efflorescence. The little points composing the exantheme of the latter affection, rise out of a uniformly erethematous blush of the skin, whilst those of miliary fever appear to be seated on a skin preserving its natural color. Great præcordial anxiety generally attends the coming of the miliary eruption: and about the period of its subsidence, a second eruption similar to the first may appear, in some instances followed by a third crop of papulæ.

Prognosis.—As the disease may take place under diverse modifications and every grade of severity, from the mildest to the most malign, the prognosis must, of course be extremely various. It should in all cases be formed with a proper degree of caution, even where the disorder at first assumes the least alarming aspect; for the symptoms may be those of the simple and regular form alone during a few days, and then suddenly give place to others of the most violent and dangerous character: this is more especially apt to be the case when considerable severity characterizes the prevailing epidemic. Bearing this in mind, we may remark, that simple scarlatina is rarely attended with any hazard to the patient, unless dangerous secondary affections supervene during the subsidence of the disorder, or the period of convalescence, from cold or accidental causes. Peculiar danger is always connected with the anginose variety of the disease; and, in the malignant form, it is to be ranked among the most fatal of maladies. Generally, and perhaps justly, the hazard from scarlatina is estimated by the character and violence of the anginose affection. Dr. Armstrong seems to hold a contrary sentiment: at least, the affection of the throat by itself, he regards as but rarely the cause of death—a termination, he thinks, attributable rather to violent internal venous congestion and visceral disorganization, so common in the more violent grades of this disease. When the eruption is brightly red, and uniformly diffused over the whole or a greater part of the body, the progno-

sis is better than when it is pale or purple or brownish, and appears only here and there in large patches. (Armstrong, Reil.) Irregularity of the eruption is an unfavorable symptom,—as, for example, where it displays by turns a red, pale or brownish aspect; now appears chiefly on one part, then on another; vanishes for a time and again reappears; or at an early period suddenly vanishes altogether. It is remarked that a white streak, passing down along each side of the nose and encircling it below, is a fatal sign. (Reil.) A vivid redness and considerable tumefaction of the fauces, attended with pain or swelling, are better indications than a livid or dark red aspect of the inflamed part, without swelling and painful deglutition. White sloughs in the fauces are also more favorable than cineritious or brown ones. If on a sudden a strong inclination is felt to urinate, and a copious quantity of crude watery urine is voided, the danger may be considered great. (Richter.) The occurrence of gangrenous ulceration in the throat is of course always alarming.

The grade and character of the attendant fever, as might be expected, has an important bearing on the prognosis. A moderate degree of reaction is favorable; a typhus grade is the reverse; and extreme violence of fever in the commencement, with much angina, is a sufficient reason for apprehending early and hazardous collapse. Where febrile reaction is prevented or much impeded by great internal nervous congestion, there is every thing to fear; and a no less alarming event is the supervention of visceral inflammation. Collapse soon comes on in these cases; and if death does not speedily ensue, great prostration takes place, with the fatal symptoms of coma, constant delirium, and cold extremities: if to these be added petechiæ, wasting hemorrhages and involuntary discharges from the bowels, a hasty dissolution may with certainty be predicted.

Children except when suffering from painful dentition, are apt to be afflicted more lightly than adults with the disease. It is said to be most dangerous when it assails persons between the ages of fifteen and twenty-five.* Peculiar hazard likewise attends it, when it makes its appearance during pregnancy, and particularly in the puerperal state. In general, robust and

* Reil. loc. cit. vol. V. p. 138.

healthy individuals suffer less from scarlatina, than subjects of a feeble, lymphatic and nervous temperament.

A regular abatement of the heat and efflorescence of the skin, associated with diminished frequency in the pulse, and a lateritious deposit in the urine; a subsidence of the swelling, with separation of the sloughs, and healthy granulation of the ulcers; and lastly desquamation of the cuticle, are all indicative of a favorable termination to the disease.

Sequelæ.—Many troublesome and often dangerous disorders ensue on an attack of the scarlet fever. Of these *anasarca* is by far the most common, there being no other acute disease, that is so liable to be followed by dropsical effusions. This emphatically is true in reference to the anginose variety. Nine or ten days almost always elapse after the disappearance of the eruption, before the anasarca is perceived; and it continues commonly for the space of two or three weeks. It is observed by Bateman, that "when anasarca becomes pretty general, a sudden effusion occasionally takes place into the cavity of the chest, or into the ventricles of the brain, occasioning the death of the patient in a few hours." But, in general we have no reason to apprehend dangerous consequences from the dropsical effusion.

At times the disease has given rise to various nervous affections, such as hysteria, spasmodic asthma, chorea, epilepsy,* and neuralgic pains in the extremities; and occasionally it has been followed by strumous disorders, chronic cutaneous eruptions, herpes, gutta serena, and rheumatic pains. The malignant and anginose varieties are moreover sometimes succeeded by tonsillar abscesses, enlargement of the parotids, inflammation of the testicles, ophthalmia, deafness, otitis, inflammation of the mucous membrane of the bowels, excoriations about the nates, suppuration of the glands of the neck, chronic cough, bronchitis, or other slow suppurative inflammations, with hectic fever and its train of evils Dr. Armstrong and others have observed, that the hair is very apt to come out on the abatement of scarlatina, in which case it will never look or grow well again.

* Kreysig. Abhandlung uber des schailackfieber, &c. p. 59. See also Cappel. abhand von Scharlachsauschlage, p. 90. Reil. Fieberlehre. Bd. 5. p. 122.

The more complete and conspicuous the desquamation, the less liability is there to secondary disease during convalescence.

Treatment.—It is evident from the description we have given of scarlatina, that our treatment must be greatly varied, to adapt it properly to the many varieties and modifications the affection is wont to assume.

Simple scarlatina requires nothing but the mildest antiphlogistic management. One or two gentle aperients or œnemata should be administered; cool or tepid drink prescribed, such as barley water, lemonade or toast water acidulated with lemon juice or muriatic acid; and the patient be restricted to mild unirritating liquid diet. He should also be confined in a room, the temperature of which must be kept at a moderate and an equable degree. In addition to these measures, nothing more in general is necessary, than the use of slightly astringent and emollient gargles, such as sage tea, with a small portion of alum, and sweetened with honey; or an infusion of green tea.

Occasionally the forms of the disease will assume a severe aspect, and present symptoms of very considerable febrile irritation. More vigorous measures are now required, as it may be converted by a continuance of the high vascular excitement into scarlatina anginosa. Although the disease be manifestly simple in its form, if the febrile action be aggravated, it is prudent that we should endeavor promptly to restrain the phlogistic tendency, without interfering too much with the regular, and we may presume, necessary excitement of the heart and arteries. The "nimia diligentia medici" has doubtless been sometimes productive of much harm in simple scarlatina; but to the judicious practitioner, the grade of the existing symptoms will be a safe guide, in the employment of antiphlogistic measures.

It should moreover, be borne in mind, that from the aspect of the disease in its onset, we cannot always correctly predict its subsequent character—whether it shall be simple or complicated mild or dangerous. However benign therefore, the prevailing epidemic, whenever we are called to a case in the former stage marked by considerable lassitude and oppression, paleness of the face and skin, some headache and nausea, it is expedient to com

mence the treatment, as if the complaint were about to assume an aggravated character. An emetic, promptly administered, will do much good by removing internal venous congestions and encouraging wholesome reaction. After its operation, it will be proper to exhibit a brisk mercurial purge. Where much affection of the head exists in the forming stage, Dr. Armstrong advises the use of the warm bath strongly impregnated with salt. "This practice," he remarks, "assisted by a brisk purgative, will in general give immediate relief, and contribute powerfully to moderate the subsequent reaction." When the succeeding febrile excitement is of a high grade, it should be reduced by purgatives, tepid effusions, cooling drinks, rest, ventilation, and some of the more gentle diaphoretics—such as spiritus mindereri, sweet spirits of nitre, or small doses of antimony and nitre.*

Far more vigorous measures are required in the *anginose* variety of the disease. Emetics in the beginning of this, as indeed in every other form of scarlatina, are justly regarded by the profession as among our most valuable curative means. The earlier their employment, the more beneficial in general will be their effects: in the forming stage particularly, or at the very onset of the malady, they are most decidedly efficacious.† Given thus early, they often meliorate the whole subsequent course of the disease; and, in some instances, interrupt, almost completely, the train of morbid action. Some have indeed recommended them at every period of the complaint; (Withering,) but almost all practitioners are agreed, that the forming stage is the only proper period for their exhibition. The good effects of an emetic, in the beginning of the disease, depends, probably, chiefly on the centrifugal direction which active vomiting communicates to the circulation, tending, thereby, to obviate internal congestions and secondary visceral inflammation; and, perhaps, also, in part on

* Armstrong. Treatise on Scarlatina, Ancerles, &c.

† Numerous authorities of great weight might be quoted in evidence of the good effects of emetics in this disease. They are recommended by Tissot, (Anis au-peuple,) Stoll; (Ratio medend. tom. ii. p. 248;) Withering; (account of scarlet fever and sore throat, as it appeared at Birmingham in 1773, and London in 1779, p. 300;) Steiglitz; (Versuch enier pruifung und verbersserung der yezt gewœhnlichen behandlimgs art des scharlachfiebers, p. 231; Richter; (Specielle Therapie, Bd. ii., p. 480;) Reil; (Feberlehre, tom. v. p. 166;) Armstrong; (on scarlet fever, &c.;) Rush; (Medical Inquiries.)

the impairment or disturbance of the morbid sympathies, connected with the disease.

Formerly, there existed much prejudice against the employment of purgatives in this disease, but of late years they have been strongly recommended. Dr. Hamilton* particularly insists upon their efficacy in scarlatina, and the testimony of all modern writers is in accordance with his opinion. My own experience, though limited in this form of the affection, has led me to think very highly of the utility of moderate purgation. With the exception of an antimonial emetic in the beginning, I have, in a majority of cases, confided almost exclusively in the employment of aperients, with cooling applications to the surface, or an antiphlogistic regimen and the local applications, to be hereafter mentioned. No measure is better calculated to prevent the hazardous occurrence of coliquative diarrhœa in the latter period of the disease, than the proper administration of laxatives in the earlier stages. But as a general rule, strong purgation is by no means necessary or expedient. From three to four evacuations in the course of twenty-four hours are sufficient to procure all the advantages derivable from purgatives,† unless cerebral congestion exists, when active catharsis is obviously indicated.‡

The efficacy of antimonials, and the usual refrigerant diaphoretics, does not appear to be very decided in this affection. "In truth," says Dr. Bateman, "the temperature is too high to admit of a diaphoresis; and the only safe and effectual method of producing this effect, consists in reducing the heat of the surface by the application of external cold." Nevertheless, we have the authority of Richter in favor of the internal use of muriate of ammonia, when the fever is strong after the sufficient evacuation

* Treatise on Purgatives.

† Bateman, Gregory, Richter, Reil, Willan. By Dr. Armstrong, active purges are preferred to mild ones in anginose scarlatina.

‡ Rhubarb and calomel; rhubarb and soda, in equal parts; calomel with small portions of antimonial powder; (Willan;) calomel, followed by a small dose of magnesia; small portions of the sulphate of soda or magnesia; an occasional dose of two or three grains of calomel, with the daily use of castor oil, or the administration of laxative enemata, may be used for this purpose.

of the bowels.* It should be given in union with emetic tartar, according to the following formula:

℞. Muriat. ammoniæ, ... ℥ss.
Pulv. extract. glycyrrh. ℥i.
Tart. antimonii. . . . . gr. i.
Aq. fontanæ, ... ℥viii. M. ft. s.
A teaspoonful to be given every three or four hours.

Notwithstanding the use of the foregoing remedies, the inflammatory condition will sometimes increase, and the patient become anxious and very restless. Diluted sulphuric acid, in these cases, has been given by Steiglitz in large and frequent doses, with excellent effect. (Abhandl. feur Pract. Arzte. B. xxii. p. 307.)

The application of cold water to the surface cannot be too highly estimated in the higher grades of this affection. "We are possessed of no physical agent," says Bateman, "as far as my experience has taught me, (not excepting even the use of bloodletting in acute inflammation) by which the functions of the animal economy are controlled with so much certainty, safety and promptitude, as by the application of cold water to the skin, under the augmented heat of scarlatina and of some other fevers. This expedient combines in itself all the medicinal properties which are indicated in this state of disease, and which we should scarcely, *a priori*, expect it to possess; for it is not only the most effectual *febrifuge* (the 'febrifugium magnum,' as a reverend author, Dr. Hancoke, long ago called it,) but it is in fact the only sudorific or anodyne which will not disappoint the expectation of the practitioner under these circumstances. I have had the satisfaction, in numerous instances, of witnessing the immediate improvement of the symptoms, and the rapid change in the countenance of the patient, produced by washing the skin. Invariably, in the course of a few minutes, the pulse has been diminished in frequency, the thirst abated, the tongue has become moist, a general free perspiration has broken forth, the skin has become soft and cool, and the eyes have brightened; and these indications of relief have been speedily followed by a calm and refreshing sleep." The only precaution requisite in the application of cold water in this, as in every other febrile affection, is to ascertain that no sense of chilliness is present, and that the skin is dry and

* Specielle Therapie, B. ii. p. 490.

above the natural temperature. Pouring or affusion over the body is the best method of applying the water, where there is excessive vascular action with intense heat of the surface; but where either of these modes is impracticable, or opposed to the wishes of the patient and his friends, we must resort to washing or sponging the skin, every hour or two, until the temperature and circulation be moderated. Cold water simply, or vinegar and water may be used for this purpose. As the disease advances, Dr. Armstrong recommends that *tepid* affusions be substituted for cold; and, as a general rule, he thinks it prudent to commence with them after the third day of the stage of excitement. It is best, however, to be governed in this matter by the degree of cutaneous heat and arterial excitement present; for at any period of the disease, provided there be a hot and dry skin, cold water may be safely and beneficially employed.* (Dr. Stranger.) Purgatives and cold affusions may be employed conjointly. According to Armstrong, they are more efficacious in this way, particularly during the first three days of the stage of excitement, than when employed separately; and my own observation is in favor of this opinion. Within the period just named, blistering may also be beneficial. Where tonsillar inflammation and tumefaction exist to such a degree as to occasion painful deglutition, a blister to the throat will often afford considerable relief. Willan, Heberden, and Rush speak very highly of this practice.

The complication of the complaint with visceral inflammation, renders the employment of cold or tepid affusion almost, if not entirely useless; and it is observed by Armstrong, that where these means in conjunction with purgatives are unavailing, the practitioner may be sure of the existence of some latent inflammation. In a case of this nature, provided there be no signs of approaching collapse, recourse must be had to sinapisms, blisters, and small general or topical abstractions of blood. When much vascular irritation exists, or incipient phrenitis comse on—as indicated by the flushed and turgid countenance, intolerance of light, severe pulsating pain in the head, more or less delirium, and a disposition to somnolency—the patient must be laid in a cool situation with his head elevated, *and blood drawn according to the*

*Willan on Cutaneous Diseases. Note at p. 360.

*state of the pulse.** In addition to this, an active purgative should be given, warm fomentations or sinapisms applied to the feet, cold water to the head, and cups to the temples, or blisters to the back of the neck. But in all our measures we should never lose sight of the imminent risk of *collapse*,—as this condition nearly always speedily ensues in this affection, upon the supervention of internal visceral inflammation, and when present, utterly forbids the use of sanguineous or other evacuations. Dr. Armstrong remarks, that "in such examples, the question is simply this—whether is greater danger to be apprehended from the inflammation or from the depletion?" Visceral inflammation, in his opinion, almost invariably terminates fatally, but depletion only occasions debility, and rarely is debility the cause of death. He believes it therefore right, even in the stage of collapse, to arrest, if possible, the inflammation, by depletion, wherever it may be seated. It is true, that debility may rarely be "the cause of death"; but that it favors the occurrence of this event can hardly be doubted. Why is visceral inflammation so fatal in these cases? The most rational answer is, *because it is associated with universal debility.* It is evident, therefore, that whatever augments this debility or prostration, must hasten a fatal termination. Depleting does indeed appear to us to be a desperate practice; and before adopting it, we would do well to recollect, that internal inflammation cannot be materially mitigated by a small bleeding, and that from a large one death must inevitably result. Herein is the reason why cases of this nature are so exceedingly perplexing; the most efficacious remedies for inflammation being sure to increase the prostration. When the inflammation is seated in the brain, we may apply fomentation to the feet, and dry cups to the temples or shaven scalp, at the same time that we exhibit active purgatives in conjunction with carbonate of ammonia or camphor. In other visceral phlegmasiæ attended with collapse, I should be disposed to resort to calomel and opium, with dry cupping and large

* *Armstrong; Marcus, (Specielle Therapie, tom. iii. p. 272); Lorry, (Hist. de la Soc. Roy. de Med. t. ii.); P. Frank, (de Curand. Homin. Morbus); Rush; Burserius, (Institut. Med. Pract. vol. ii. p. 72); Heim, (Horn's Archiv. fur Medic. Erfahr. vol. iv. b. 1. p. 150.); Richter; and many other eminent authorities may be adduced in favor of prompt bloodletting in such cases.

fomenting cataplasms over the region of the affected part. Blisters in these cases are almost as hazardous as bleeding: they give rise to much general irritation, and gangrene often takes place in the blistered part.

Malignant scarlatina exchanges so speedily its highly phlogistic symptoms for those of a low and typhus state, that physicians were once in the habit of resorting immediately to the use of bark, wine and other stimulating and tonic remedies. "These remedies," says Dr. Armstrong, "so forcibly, so indiscriminately, and so fatally recommended by numerous authors, were once the means upon which, unfortunately, I relied for the cure of this modification of scarlet fever; and from repeated trials of them, I can truly affirm that they are the most pernicious in the first stage, and most destructive in the second." However quickly this variety of the disease may put on a malignant form, its irruption is often marked by highly inflammatory symptoms. The vehemence of the attack and the intensity of the excitement rapidly exhaust the vital energies; so that in proportion to the violence of this tumultuous, transient stage, will be the tendency of the complaint to assume a putrid character. Energetic measures are therefore imperiously required promptly to allay the initial febrile commotion. The remark I have already made in reference to the exhibition of emetics, followed by brisk purgation, in the commencement of the other forms of scarlatina, are equally applicable to this variety. If called sufficiently early, these should always be our first remedies. When, after their operation, the stage of excitement begins with violent symptoms—such as intense heat of the skin, a frequent, quick, and tense pulse, severe headach and delirium—prompt and efficient venesection should be practised. (Burserius, Lorry, Armstrong.) As the time allowed us for the prosecution of these vigorous measures is but short, it is highly important to draw blood at once, to the extent of producing a very decided impression on the system; or, according to Armstrong, until syncope approaches. One such bleeding, with the brisk operation of a purgative, will often so allay the violence of the disease, that its subsequent course shall be divested in a considerable degree of its dangerousness. But it should be borne

in mind, that these active depletory remedies must be entirely restricted to the *early period* of the stage of excitement; for the approach of collapse renders bleeding utterly inadmissible.—(Armstrong.)

In every form of scarlatina, during the stage of excitement, *purgatives* may be employed with propriety. *Calomel* has been particularly recommended, both in the mild and malignant varieties;* and by Dr. Rush was administered throughout the whole course of the malady. A combination of calomel, precipitated sulphuret of antimony, and emetic tartar, according to the annexed formula,† is recommended in high terms by Seelig: it is said to be a gentle laxative, and an antiphlogistic alterative in the disease under consideration. In conjunction with purgatives, the warm-bath may be advantageously employed, particularly in cases attended with internal inflammation.

The collapsed stage of the inflammatory modification of scarlatina, is not apt to be extreme, where a prompt and vigorous antiphlogistic treatment has been pursued in the commencement of the disease. When it takes place after such a treatment, we may in general sufficiently sustain the system by the administration of wine whey, weak solutions of ammonia, infusion of serpentaria and by directing a milk diet, quietness and proper ventilation. (Armstrong.) But when from inefficient or improper measures in the beginning, or a peculiar malignancy of the disease, great and universal collapse ensues, (and such is the result but too frequently, both in the inflammatory and congestive modifications of malignant scarlet fever,) recourse must be had to more decisive stimulating and tonic treatment. The carbonate of ammonia in frequent and active doses; wine; camphor and opium where the brain is not particularly affected; infusions of serpen-

* "It is somewhat remarkable," says Armstrong, "that calomel, though given in large and frequent doses,, will hardly ever produce ptyalism in scarlatina." He states, that he has frequently given from six to eight grains of this article to children, twice, thrice, and even four times daily, without having, in a single instance, known it to produce salivation. It is considered by him the best purgative in every modification of this disease.

† ℞ Calomel, ... ℈ss.
Sulphuret. antimon. præcipit. gr. i.
Part. antimon. . . . . gr. ss. M. Divide into twenty equal parts.
Dose—one part to be taken by a child six years old, every third or fourth hour.

taria, with large doses of elixir vitriol; quinine and capsicum are the remedies on which we must rely. Peculiarly excellent effects appear to be derived from the use of *capsicum* as an excitant in this form of the affection. It was first employed with this view by Dr. Stephens, in a very fatal epidemic of scarlatina maligna, that prevailed at St. Christophers, (West Indies,) in 1787. Since then, many eminent practitioners have borne full testimony to its efficacy. The following is the manner in which it is prepared for use: Take a tablespoonful of small red pepper, a teaspoonful of common Cayenne pepper, and one teaspoonful of salt: beat them into a paste, and pour upon them half a pint of boiling water. This is to be strained, and about a gill of good vinegar added to it. Of this liquor, when cold, a teaspoonful is to be taken every half hour, and the throat should be frequently gargled with it. It is stated by Dr. Stephens that he employed this remedy in about four hundred cases, and with surprising success: the slough in the fauces was soon thrown off, and the ulcers began to heal; an agreeable sensation of warmth spread throughout the general system, and a more vigorous condition of the vital powers was superinduced.

The *flowers of arnica* are favorably mentioned by Malfatte,* and by Steiglitz they were employed with much advantage in this stage of the complaint. Reil speaks in high terms of large doses of musk, especially where the patient is much harassed by restlessness and nervous irritation. We may also derive advantage from stimulating frictions with brandy, camphorated spirits, or tincture of capsicum. (Reil, Steiglitz.) The cooling drinks, acidulated with lemon juice, the sulphuric or muriatic acids, which should be freely allowed in the stage of excitement are well substituted during the subsequent stages by infusions of sage, balm or catnep, with sulphuric acid.

The treatment proper in the *congestive modification* of scarlatina maligna, does not require in this place an extended notice. As the curative principles in all congestive states of febrile diseases are alike, what has already been said in relation to the treatment of congestive measles, is applicable to the present malady when appearing under this modification. Our first

* Hufeland's Journal, Bd. 12 at 120.

efforts, if symptoms of oppressive internal venous congestion should mark the rise and progress of the complaint, must be to rouse the action of the sanguiferous system and recall the blood to the surface, thus relieving the overburthened internal organs. To accomplish this object, we should make an assiduous use of frictions and warm and stimulating applications to the skin; stimulating enemata; warm and gently stimulating ptisms; large doses of calomel, (5–10–15 grains), and small doses of camphor where there is much irritability of stomach. If these measures succeed in bringing about a moderate febrile reaction, we may properly commence at once with the use of the milder stimulating remedies—such as infusions of serpentaria or calamus, wine whey or carbonate of ammonia in small doses. But as the disease advances and collapse approaches, we must resort to the more active excitements already noticed, with a vigor correspondent to the degree of prostration present.

Local Treatment.—To diminish the tendency in the fauces to ulcerate, to arrest the progress of ulceration, to promote the separation of the sloughs, and dispose the ulcers to heal, are the objects to be effected by our local applications. Of these a great variety has been recommended. Fumigation with nitrous gas is highly spoken of by Willan; others advise the application of a weak solution of nitrate of silver; and some, of the sulphate of copper, to the sores. They are doubtless all beneficial at times. Various gargles have also been employed, and of these, the infusion of Cayenne, mentioned above, is perhaps the best. Dr. Jackson, of Northumberland, Pa. states that he has recently made use of ice and iced water with surprising success. He permits the patient to drink the coldest ice-water, and, enclosing a piece of ice in a gauze bag, he puts it far back into the mouth that it may be dissolved and swallowed. I have seen much good done by a strong infusion of the root of *baptisia tinctoria* (indigo plant); and the *black wash* (calomel, gr. xx. lime-water, ʒviii.) I have also found a very valuable article in several cases of putrid sore throat. An excellent gargle to wash away the acrid matter from the inflamed and ulcerated fauces, is *barley-water*, acidulated with sulphuric or muriatic acid. The same good effect may often be

derived from a gentle emetic, provided neither collapse in the anginose variety, nor visceral inflammation be present. "Emetics," says Armstrong, "are the best gargles, where the throat is much obstructed from an accumulation of tenacious mucus; their operation effectually dislodges that morbid secretion for a time; often greatly relieves the respiration; improves the appearance of the ulcers; and they may be repeated where no abdominal inflammation exists, at any time, during the continuance of the fever, whenever the respiration and deglutition become much impeded by an accumulation of phlegm."

Convalescence.—Convalescence from scarlatina is generally very tedious. During its continuance, light and nourishing diet should be directed, and the patient carefully guarded against cold and vicissitudes. Where much weakness and relaxation are complained of, it will be proper to prescribe the usual tonic and cordial remedies—such as weak infusion of serpentaria, colomba, gentian, or calamus aramaticus, with some of the mineral acids, particularly the sulphuric. These remedies are wholly inadmissible, where more or less irritation remains, which is sometimes the case during the early part of this period—as indicated by the quick and frequent pulse, pale and dry skin, anorexia, disturbed sleep, and inactive bowels. Here, we must resort to gentle aperients, diaphoretics and warm-bathing; and direct a simple, unirritating diet. Small doses of calomel in union with ipecacuanna, three or four times daily; the muriate of ammonia; digitalis with nitrate of potass; spiritus mindereri with minute portions of emetic tartar; infusion of eupatorium or elder blossoms; acidulated diluents, &c. will generally answer well in cases of this kind. As the susceptibility to the harmful influence of vicissitudes is always peculiarly great immediately after an attack of this disease, the patient should be extremely careful to avoid taking cold, remaining within doors during the whole period of convalescence, unless the weather be warm or mild.

The frequent occurrence of dropsy after every modification of scarlatina has been, generally, ascribed to injudicious treatment in the febrile stage of the disease, or to errors in diet, or imprudent exposure to cold during the period of desquamation and con-

valescence. This may be true, in part; but, from the occasional supervention of this sequela, after the most judicious management in all these respects, it would seem that a tendency to hydropic effusion is created by the orignal disease itself, by reason, perhaps of some irregularity in the development of its train of morbid actions,—in which case the dropsy or some other disorder may accrue as a complemental affection.* These dropical effusions are seldom attended with danger, and in general are easily removed. We may expect, in most examples of the sort, to find a manifestly phlogistic state of the system,—the pulse being quick, sharp, tense, frequent, and sometimes full; the skin dry, harsh, and above the natural temperature; urine small in quantity, high-colored and charged with coagulable serum; and the bowels usually torpid. Every thing indicates the propriety of an antiphlogistic treatment. Venesection is strenuously recommended by Richter and other eminent authors, some of whom are quite recent. In the epidemic scarlatina, described by Burserius, that prevailed at Florence in 1717, the affection readily yielded to the measures advised by Sydenham. About the twentieth day of convalescence, many became affected with cough, a sense of weight in the chest, and œdema of the face and forepart of the neck. Fever soon ensued; the dropsy became general; the breast was sore; the abdomen distended and painful; the urine very small in quantity, and in some instances entirely suppressed. All who took diuretics died. Dissection soon revealed inflammation of the lungs, intestines and kidneys.† Bloodletting was now freely practised, and with uniform success. Gregory does not appear to be decided as to the propriety of venesection. "I have met," says he, "with several cases which appeared to indicate bleeding and purging, but which resisted both, and ultimately yielded to bark and aromatic confection." Where there is an evidently phlogistic diathesis, my own experience is in favor of the measure, not indeed as a principal curative means, but as an important preparatory step to the use of diuretics, purgatives and diaphoretics.

Digitalis, alone or in combination with small portions of calomel and nitrate of potass, is the best diuretic in cases of this

* Reil, loc. cit. vol. v. p. 186. † Burserius, Institutiones Med. Pract. vol. ii. p. 81.

nature. In this, as well as every other variety of inflammatory dropsy, I have found the following a very useful prescription.* It possesses at once purgative and diuretic properties. Advantages may also be derived from small doses of tart. antimon. dissolved in a large quantity of some mucilaginous diluent. Calomel in large doses is recommended by Richter, who prescribes from five to ten grains daily to children. Throughout the treatment, quietude should be enjoined, and the patient restricted to the mildest farinaceous diet, with cooling acidulated drinks; and the occasional use of the tepid bath will often prove beneficial.

But febrile irritation is not always associated with these hydropic effusions. They may be connected with a relaxed, torpid, and leucophlegmatic state of the system—constituting the *hydrops frigidus* of the German writers. (Reil.) "The principal remedy," according to Richter, "in cases of this kind, is calomel in doses sufficiently large to evacuate the bowels freely. Decided advantage may often be derived from the use of the cinchona bark, and the various medicinal preparations of iron—particularly the black sulphuret. As diuretics in this variety of dropsy, squill, spirits of turpentine,‡ and the tincture of cantharidies, have been highly recommended, (Hufeland, Buchholz.) The following mixture is said to have done much good in such cases.§

*℞ Crem. tart. ʒ i.
P. sulphat. potassæ, ʒiii.
P. scillæ, ʒii.
Tart. antimon. gr. iss. M. s.

Give from four to six grains three or four times daily, to a child of five years old.

Kreisig is equally favorable to the use of calomel in this and other morbid consequences of scarlatina. "Against the sequela of scarlatina," he remarks, "the powers of calomel are great and cannot be too highly praised." *Abhandl. euber das Scharlachfieber*, &c. p. 107.

‡ ℞ Spirit terebinth. ʒi., tinct. opii, gtt. l. M. s. From ten to twenty drops to be given thrice daily to children from five to ten years old.

§ ℞ P. cinchon. ʒss.
Aq. fement. ℥xii. coque andremand. ℥vi. dein adde.
Rad. polygal. seneg. ʒii.
Fol. digitalis, ℈i. cola. dein. adde
Spirit. nitri dulc. ʒii.
Syrup cort. aurant. ℥ss. M. s.

Take from a tea to a tablespoonful every two hours, according to the age of the patient.

Prophylactic Measures.—*Bella-donna*, regularly taken by persons exposed to the contagion of scarlatina, is supposed to protect the system effectually against the disease. Hahnemann, the author of the homæpathic doctrines, was the first who introduced to the profession the prophylactic powers of this narcotic, and since then many statements have been published in Germany and France in confirmation of the fact.* In conformity to his peculiar notion, it was prescribed by him in *infintesimal doses*. He gives but forty drops, in seventy two hours, of a solution, of which one drop contains no more than the twenty millionth part of a grain of the extract! We may well be sceptical as to the efficacy of these doses; but that small doses of the article do really possess prophylactic virtues, is strongly testified by many respectable authorities. Berndt states, that he gave it with unequivocal advantage in this respect. It was found by Dr. Koreff of Berlin, to protect persons completely against the disease, when taken for eight or ten days before they were exposed to its contagion. Three grains of the extract are to be dissolved in an ounce of cinnamon water, two or three drops of which may be given to children under one year old, and one drop more for every year above this age.

It has been found that, seclusion of the sick, free ventilation, frequent changes of linen, and other similar precautions, will prevent the spread of the disease even in the same family. Unlike other contagions, the contagious miasm of scarlatina appears to be incapable of attaching itself to clothes: but an intensely infectious power is said to reside in the breath of patients laboring under the malignant form of the disease,—as also in the matter discharged from the fauces.

* Ed. Med. and Surg. Journ. Jan. 1825.

CHAPTER XXXVIII.

PERTUSSIS—WHOOPING COUGH.

According to certain writers, whooping cough was brought into Europe from Africa, in the thirteenth century. It would seem, however, that the ancients were by no means unacquainted with this remarkable disease. Hippocrates, in the 6th book on epidemics, and also in the 6th section of his aphorisms, speaks of a cough, which, from the short description he gives of it, may be regarded, I believe, as the same affection that is now known under the name of whooping cough. The first distinct and comprehensive account we have of the disease, was furnished by Maezray, in the year 1414, in his chronological history of France. Since that period, numerous circumstantial records of its occurrence in epidemics have been published; and its nature and treatment have been discoursed upon, in not a few elaborate monographs.

Symptoms and progress of the disease.—The symptoms of common catarrh usually precede the invasion of whooping cough. In the beginning, lassitude, head-ache and sneezing, with hoarseness and occasional oppression of breathing, are experienced in a greater or less degree. Dreams and sudden starts disturb the sleep; there is impairment of the appetite; the bowels become sluggish; and a slightly febrile excitement is evident towards evening. During the first two or three weeks, the cough is almost invariably dry and ringing; and the paroxysms short and unattended by that peculiar convulsive clangor, termed whooping.

About the end of this period, the disease begins to manifest a more convulsive or spasmodic character, so far at least as the mere cough is concerned. The frequency and duration of the fits of coughing are increased, and when the malady is at its height, their violence is sometimes terrific. A sense of tickling

in the larynx and præcordia, and a feeling of tightness in the breast are the usual precursors of a paroxysm. During its continuance, the inspirations are extremely difficult, slow and stridulous, attended with a sense of obstruction or spasmodic stricture of the glottis, rendering the cough distressingly suffocating, and in a manner convulsive. The face becomes turgid and purple from suffusion; the eye-balls are protruded and swollen; and the whole system violently agitated. So severe, in some instances, is the fit of coughing, that it induces a state of partial insensibility, and a dreadful feeling of impending suffocation. Occasionally, sanguineous determination to the head is so great, that blood bursts from the nostrils and mouth; and it is nothing uncommon for children to be attacked with convulsions, in consequence of cerebral compression, resulting from this cause. The discharge of a large quantity of viscid mucus, in this period of the disease, is the ordinary termination of a paroxysm; and the patient now frequently complains of some pain in the breast. In many cases, the cough continues until the accession of free vomiting, when it is immediately arrested, the patient greatly relieved, and a craving for fresh food experienced. The duration of the fits of coughing is very various: in some instances, being less than half a minute, in others, five or six minutes, and occasionally longer.

This stage of the complaint commonly lasts from four to six weeks, about which time it begins to abate. The declension is always very gradual, and from two to four weeks longer elapse, before the complete termination of the affection.

General Observations.—Fever is not essentially connected with whooping cough, although in many instances an accidental concomitant.

Children chiefly are liable to this disease, but adults are not always exempt. Two cases of it have I seen in subjects beyond the fiftieth year of age, and several in individuals, but a few years younger than this. The contagiousness of whooping cough has been denied by Stoll and a few others, but the profession concur generally in regarding it as highly contagious; and the fact is certainly unquestionable, although the range of its con-

tagion may not be extensive. It is almost always epidemic in its appearance. I have never yet witnessed a sporadic case of this affection, but such instances may undoubtedly occur. The susceptibility of the system to its infection is taken away by one attack, so that it rarely, if ever, affects the same individual twice. As in the case of all other epidemical diseases, various grades of violence mark the different epidemics of this malady. Sometimes, it is so gentle, that numbers of those who are still susceptible to its influence, entirely escape, and its treatment can be conducted without difficulty; at others, it assumes a violent and dangerous character, is exceedingly intractable, and lays hold of almost every individual, whether old or young, who has not yet had the disease. It would seem as if some sort of a latent connexion subsisted between this malady and measles; for whooping cough frequently prevails most extensively, either immediately before the occurrence of epidemic measles, or in alternation with them, or directly after their disappearance.* Spring and autumn are most favorable to the prevalence of pertussis; and its invasions during the wet and changeable periods of these seasons, are attended with far more danger, by reason of the pneumonic predispositions and affections occasioned by atmospheric vicissitudes.

Prognosis.—When whooping cough assumes a periodic form, which, however, is an exceedingly rare occurrence, it will most likely be very intractable. A singular case of this kind is related by Dr. Percival, in which the paroxysm came on daily, at a certain hour, attended with tremor of the whole body, and terminating by a shriek rather than a whoop. The complaint was obstinate for several months, and returned at the same season for two years. It yielded to no medicine, and was supposed to depend on some morbid condition of the liver. (Good.)

A fatal termination of the disease is not to be apprehended, unless by the supervention of bronchitis, pneumonia, cynanche trachealis, hydrocephalus, apoplexy, or marasmus. These secondary affections are by no means uncommon, particularly in

* Richter's Soecielle Therapie.

variable and humid seasons; the disease, therefore, upon the whole, should be regarded as one of considerable danger.

In northern or cold climates, far more violence marks the affection, than in the milder and more equable regions of the middle and southern latitudes. Rosenstein states, that in Sweden there were 43,393 deaths from this disease, between the years 1749 and 1764—and of these, 5,832 deaths occurred in the year 1755 alone. (Richter.)

In general, the danger is inversely as the age of the subject. In other words, the younger the patient, the more hazard of a fatal termination. It is observed by Cullen, that by far the greater number of those who die of this disease, are children under three years of age. Much is to be apprehended, when it attacks weak and delicate infants, within the first few months after birth; but even at this early age, robust and healthy infants generally pass through the disease without much difficulty or danger. The supervention of pneumonitis, during its continuance, is more common in adults than in children.

Its occurrence during pregnancy is to be feared, as not unfrequently it has occasioned abortion. Frequent hæmorrhage is an unfavorable symptom, protracting in almost every case the disease, and where it proceeds from the lungs, often occasioning the development of phthisis.

Whooping cough is exceedingly apt to excite the local manifestations of scrophula in children of a strumous diathesis. Thus, its attacks are often succeeded by scrophulous ophthalmia and glandular tumors in the neck. I know of no complaint whose occurrence is more to be dreaded, in subjects of an hereditary consumptive habit than whooping cough. It rarely fails to develop phthisis pulmonalis, in persons predisposed to the formation of tubercles, or in whom these exist in an incipient and dormant state.

Chronic bronchitis is not an unfrequent termination of the disease. This is particularly apt to occur, when the patient takes cold from exposure to a damp and variable atmosphere—a circumstance that always greatly aggravates the violence and danger of the affection. I have seen but few deaths from whooping cough, that were not attended with bronchitis, purulent expectoration and hectic symptoms, occasioned by having

taken cold. In these cases, the matter expectorated, usually resembles, more than any thing else I know, a mixture of cream and mucus.

The cough, in some instances, after nearly disappearing, is renewed and protracted for several months by an accidental cold. Cases of this sort often continue for six or seven months. When the disease, either from cold or some other casual circumstance, thus assumes a chronic form, fatal hydrocephalus sometimes terminates its career—especially in patients, habitually subject to disordered bowels, or laboring under the irritation of difficult dentition.

Cynanche trachealis will often supervene during whooping cough. Children of robust and full habits, in the early stages of the affection, are more particularly liable to this accident. It is almost always the consequence of cold, and attended with the most imminent danger.

According to Richter, a profuse watery diarrhœa, supervening suddenly in this disease, in connexion with pneumonic irritation, is always to be regarded as one of the most dangerous occurrences. Death, he says, often follows such a discharge very speedily. The appearance of apthæ in the mouth and fauces, in the latter period of the disease, is inauspicious. Œdematous swellings of the feet and face, supervening in the commencement of the complaint, portend much danger, more especially when accompanied by a turbid, milky urine; but their occurrence towards its conclusion, which is by no means rare, needs seldom excite any apprehensions. (Richter.) A sudden cessation of the cough, it has been remarked, is an unfavorable event, and is frequently followed by pulmonary inflammation. In general, the more fever there is in this affection, the more violent and dangerous may it be considered.

Free vomiting, soluble bowels, plenteous expectoration, warm extremities and an open skin are regarded as favorable symptoms. According to Hufeland, the occurrence of some degree of strangury in the advanced stage of the complaint, is in general soon succeeded by a manifest mitigation of the symptoms.

It is said by certain writers, (Hufeland, l. c. p. 420: Lentin, Memorabilia, p. 36: Jahn Kinderkankn. p. 399,) that children

laboring under some chronic cutaneous affection, as tinea, itch, &c., very rarely take this disease; and if they do become affected with it, they almost invariably pass through it in the lightest manner. This is contradicted by others, particularly by Hoffman and Haase.

The following are the principal affections that are properly called sequela of this complaint: strumous swellings, dropsy, epilepsy, opthalmia, rickets, general cachexy, aneurism, deafness, dementia, paralysis, and phthisis pulmonalis, ruptures and incurvations of the spine. A majority of these diseases I have known to ensue as consequences of whooping cough; and amongst them, epilepsy, struma, phthisis pulmonalis and ophthalmia appear of most frequent occurrence. When perfectly free from any adventitious complications, pertussis cannot be considered a disease of much danger, except in very young and feeble subjects. Still, in connexion with the grave sequela above mentioned, and many other consequences by no means uncommon, it assumes a very serious aspect, and is attended with no little hazard.

Cause.—The exclusive cause of whooping cough, so far as our knowledge extends, is a peculiar contagion, generated by the disease itself. That this, as well as every other contagious distemper must at one time or another have had a cause, independent of contagion, cannot, it is evident, be denied. But the nature of this cause, together with the period of its origin and the circumstances requisite to its generation, is involved in utter darkness. Nothing, in truth, is more incomprehensible, than the origin of maladies, now engendered and propagated by specific agents alone, which are elaborated by the living body, actually laboring under their influence. The only notion we can offer, (and it is indeed vague as the ancient dogma of fortuitous atoms,) is that, in the infinite combinations of which the material elements of the universe are capable, agents may have been evolved by a peculiar concurrence of circumstances, which had the power of creating these affections in the human system. This is the only plausible explanation that can be given, of the occasional rise of new diseases, which, when once originated, propagate themselves by elaborating their own specific causes;—

unless, indeed, we choose to refer them directly to the will of the Creator, as their immediate cause. But whatever may be our speculations in relation to this subject, whooping cough now is in all cases the product of a specific contagion. It is observed by Richter, that beside this principal cause, cold in conjunction with humidity may give birth to the affection. The grounds for this opinion are rather insufficient; and it seems to me just as improbable, as that small pox or measles should arise from accidental circumstances.

Linnæus, who at one time advocated the animalcular origin of almost all diseases, maintained that whooping cough was produced by inhaling, with the air of respiration, the minute eggs of a peculiar species of insect. Riverius, Dessault, Rosenstein and more recently Clesius concur in this opinion; but it seems to have met with but little countenance from the profession generally.

Whooping cough does not appear to possess a contagious character, until it has made considerable progress (Richter;) or until the second or convulsive stage has supervened. Its contagion, although very active, extends to no great distance beyond the body of the affected person. Accordingly separation of the healthy, from the infected portion of the community, will almost always prevent its influence.

Autopsic phenomena.—Various, and often contradictory, are the appearances discovered on post-mortem examination. This might naturally be expected, when it is considered, how diverse are the affections adventitious to this complaint, and at what different periods of the disease death takes place. We cannot, for example, anticipate the same post-mortem appearances in a case terminating fatally in consequence of pneumonia, as in one, where death results from apoplexy; nor is it reasonable to presume there should be much uniformity, where the immediate cause of death is so various, or dependent on so great a diversity of accidental disorders.

The respiratory organs being the parts most obviously implicated in whooping cough, pathologists have of course sought an explanation of the nature of the disease, especially in the

autopsic phenomena they exhibit. Traces of inflammation in the mucous membrane of the bronchia and larynx, have been frequently discovered and particularly described. Strong, Cullen, Astrue, Lettson and Dany, mention these appearances as being by far the most common; and more recently striking examples of the same sort have been adduced by Whatt and Marcus. The former lost three of his own children by this disease, and in each, the marks of previous inflammation in the mucous membrane of the bronchia were very conspicuous throughout its whole extent. Marcus gives but two dissections in which bronchial inflammation was revealed. In one of these, a considerable quantity of pus was discovered in the air passages, the smaller branches of which were in a state of most intense inflammation, approaching in some parts to gangrene.

In some instances, no traces whatsoever of bronchitis have been discoverable; but the lungs have been found exceedingly congested, and the air-cells choked up with an extremely viscid mucus. Loboustein Loebel relates a case, in which a considerable portion of the diaphragm was covered with a number of small pustules containing a purulent fluid.* Various other appearances have at different times been observed, such as adhesions between the pleura pulmonalis and costalis, tubercles in diverse stages of development, enlargement and scrophulus degeneration of the bronchial glands, &c.

Sometimes the respiratory organs may be entirely unaffected in their structure, exhibiting not the minutest traces of any disease whatever; whilst the brain presents various striking marks of the previous existence of severe cerebral derangement. In a case related by Dr. Webster of London, the following appearances were observed on post-mortem examination; both hemispheres were extremely vascular, and the convolutions were so pressed together as almost to disappear. A good deal of serous effusion was visible under the piamater, particularly at the anterior and upper part of the brain, where a few spots of coagulable lymph were seen; and the membrane itself was injected with blood. The hemispheres slightly cohered ante-

* Richter's Specielle Therapie.

riorly; the ventricles contained about two ounces of serum, and in the sheath of the medulla oblongata, nearly half an ounce of fluid was discovered.

After all, it is incontestible, that in many cases of death from whooping cough, no morbid appearances whatever have been detected on dissection; and there are many reasons for believing that the inflammation and other phenomena, so frequently observable on post-mortem examination, have no essential connexion with the disease, but are altogether adventitious or secondary.

Proximate cause.—Concerning the nature or proximate cause of this disease, there has been much diversity of sentiment. By Hoffman it was thought to depend upon an acrid serum in the lungs. Sydenham ascribed it to the influence of irritating effluvia, cast off from the blood into the lungs, in consequence of the insensible transpiration through the skin, being checked by cold and damp air. It was referred by Huxham to some morbid condition of the intestinal canal; to derangement of the liver by Butler, whilst others have considered it the result of gastric irritation, or with Stoll, of crude and bilious matters in the stomach.

The opinion, seemingly most prevalent at the present day, is that the disease essentially consists in bronchial inflammation. This inflammation is assumed to be specific in its nature, and capable of giving rise to the peculiar convulsive cough of pertussis; for it is well known that the train of symptoms characteristic of this disease are not induced by bronchitis. The doctrine would seem to receive support from the presence of febrile excitement in most instances of the affection, and from the appearances revealed by autopsic examinations of the mucous membrane of the bronchia and trachea. On a superficial view of the subject, the notion does certainly appears plausible; but objections insurmountable in my opinion, may be urged against its validity. In the first place, although fever is a frequent attendant on pertussis, many cases occur, in which not the slightest febrile movements are perceptible in its early stages; and not a few happen, where, during the whole course of the disease,

febrile excitement is entirely absent. Again, that traces of inflammation are sometimes manifested on post-mortem examination, is not denied; but these appearances are by no means visible in all cases, which ought to be the fact, if the doctrine in question were true. Besides, it is no difficult matter to explain the frequent occurrence of inflammation, without having recourse to this hypothesis. Is it not natural to look for the supervention of bronchitis or other inflammatory affection of the respiratory organs, in a disease that so violently and frequently agitates the thoracic viscera, as does whooping cough? There can be no doubt too, that in many instances, where this cause fails in developing pulmonary inflammation, it may strongly predispose the lungs to the injurious influence of atmospheric vicissitudes, whereby pulmonary catarrh or bronchial irritation are at last superinduced. We therefore have good grounds for concluding, that the signs of phlogosis so frequently detected, on dissection, in the mucous membrane of the respiratory passages, are always adventitious, and by no means essential to the disease. It may be further observed, that bronchial inflammation is probably far from being so common, as autopsic appearances would lead one to think. Death, it must be recollected, takes place principally where unequivocal symptoms of inflammation are present; we may reasonably expect therefore, to find in these cases phlogistic appearances, although in milder instances no such inflammatory condition may exist. To conclude this part of the argument,—if bronchial inflammation be the proximate cause of the disease, it must, of necessity, be present in all cases; no less in the mild than the violent; a circumstance that is decidedly contradicted by almost universal observation. The only dissection I ever witnessed of a victim to this malady, presented no evidence of the existence of previous inflammation in the bronchia. The patient died suddenly of convulsions during a violent paroxysm of coughing.

That bronchitis is not the proximate cause of whooping cough, or essential thereto, is further evident from the fact, that the two diseases totally differ in their symptoms. Bronchial inflammation is rarely, if ever, attended with a violent cough, much less the peculiar cough, distinguishing pertussis. Moreover, rapidity of

course, strong fever, and a continued sense of tightness and oppression in the breast, characterize bronchitis in its acute form. In the chronic form, the expectoration is invariably purulent, and entirely distinct in its character from the ropy and transparent mucus discharged in whooping cough. Almost invariably, too, the usual symptoms of hectic fever are present. Cough, dependent on acute inflammation of the respiratory passages, almost always begins to decline so soon as the secretion of the bronchial mucus becomes copious. In whooping cough, the reverse generally obtains. During the first few weeks of its course, there is seldom much mucus secreted in the bronchia, but so soon as the secretion becomes more abundant, which happens after the second or third week, the cough also acquires more violence, and assumes that convulsive character, which distinguishes it from other varieties of cough.

Very commonly, moreover, the slight symptoms of fever that accompany the development and first few weeks of the disease, vanish entirely in the second stage when the cough becomes more spasmodic and violent in its paroxysms. (Richter.) This circumstance most assuredly does not favor the idea, that the disease is of an inflammatory character; for if this were the case, we should expect the cough to decline with the fever, instead of which, it is always found to acquire much more violence.

It appears to me that whooping cough is essentially a spasmodic or nervous affection, the proximate cause of which consists probably in a peculiar irritation of the eighth pair of nerves—or pneumo-gastric.

Close attention to the phenomena, that immediately precede and accompany a paroxysm of the disease, has sufficiently convinced me of its nervous character. The sense of stricture in the breast and of the glottis, felt just before the fit of coughing—the suddenness and convulsive nature of the cough—the peculiar constrictive feeling in the præcordia—the stridulous respiration—all clearly indicate a spasmodic condition of the respiratory organs. That the irritation which calls forth the convulsive action of the diaphragm and the other parts immediately concerned in the act of coughing, is seated in the eighth pair of nerves, may, I believe, be inferred from the known agency these

have, in the production of the various phenomena manifested by the pulmonary apparatus. Experiment, too, furnishes quite satisfactory evidence on this point. Professor Naase, in a series of experiments, instituted for the purpose of elucidating the pathology of cough, found that, on bruising or strongly pinching the par vagum so as to break down its structure, a violent convulsive cough was invariably excited. The same kind of injury inflicted on the *diaphragmatic* nerve, occasioned no such effect. This experiment proved, that the act of coughing is performed almost wholly by the sudden spasmodic contractions of the diaphragm. By opening the abdomen of various animals, and exposing the lower surface of this muscle, he saw distinctly its violent convulsive motions during the cough, which was excited by bruising with a pair of forceps the pneumo-gastric nerves. The peculiar tone of the cough and sense of constriction of the glottis, may arise from the extension of the irritation to the recurrent branches of the par vagus nerve. That this irritation is peculiar or specific in its character, may be inferred from the nature of its exciting eause.

Treatment.—It is generally believed that medicine can only alleviate the symptoms of whooping cough, without materially controlling its progress or shortening its regular course. This, I believe, to be an unfounded notion, the belief of which has largely contributed to render the treatment of the disease uncertain and inefficient. Sydenham, Werhoff, Hufeland, and several of the more recent German, Italian and French writers admit that its course may be arrested; but this, it is asserted, can never be done before the fourth week after its commencement. However this may be, my own experience has fully convinced me, of the possibility of abbreviating its progress; and, to sustain this opinion, not a few well-authenticated instances might be adduced from late publications.

The propriety of venesection in whooping cough has been frequently questioned. Where inflammation or general fever is present, all concur in advising its adoption; but in every other case it is by some deemed inadmissible, as the severity of spasmodic affection is frequently aggravated by the use of the lancet.

Now an unusual or preternatural momentum of the circulation may in many instances exist, without giving rise to strictly febrile symptoms; but it should not therefore be regarded as a harmless circumstance, even in diseases purely spasmodic. Let the essential nature of a complaint be what it may, if activity and fulness characterize the pulse, blood-letting cannot be improper, and its employment may be productive of much benefit. The abstraction of blood in the present disease, may be marked by no direct influence on its peculiar symptoms; but it will greatly tend to diminish the liability to the supervention of inflammation, and the danger attendant upon the violent cephalic congestion, induced during the paroxysm of coughing. Where bronchial or pneumonic inflammation is present, the lancet is of course indispensable. Bleeding in such cases should be prompt and decisive, both in a general and local way. Leeching here is particularly valuable. Tampering with the ordinary remedies now, would be to risk the life of the patient. It is the accidental inflammation, not the original disease, that must claim our attention; for great must be the danger and obstinacy of pulmonitis in an affection, which so frequently and violently agitates and irritates the respiratory organs.

The bowels in this, as in every other disorder, should be carefully attended to. The extensive and intimate sympathetic relations of the intestinal canal with the various organs of the body, cause it to participate more or less in whatever derangements may affect the human system. No matter what may be the nature of the malady or of its location, sooner or later the alimentary canal suffers functional derangement, giving rise either to a remora of its recrementitious contents, or of its vitiated secretions. These evils in their turn become sources of intestinal irritation, and it is needless to point out the strong tendency of such irritation to aggravate and continue diseases, whatever may be their primitive origin and character. There is almost invariably a morbid condition of the primæ viæ in whooping cough; the stools being sometimes bilious, at others, almost entirely mucous, and in many instances, dark and exceedingly offensive. These conditions should be rectified by appropriate purgatives, and a soluble state of the bowels preserved

throughout the whole course of the complaint. Very active purgation, as it aggravates intestinal irritation, especially when frequently repeated, must by all means be avoided. A grain or two of calomel in the evening, followed by a small quantity of rhubarb, or other unirritating laxative in the morning, will generally answer our purpose. Small doses of sulphate of soda or magnesia are preferable, where much febrile excitement is present.

The utility of emetics in the treatment of pulmonary diseases, is fully acknowledged,—especially in affection of the respiratory organs marked by an abundant secretion of bronchial mucus. Much of the suffocative distress occasioned by whooping cough, arises from the lodgment of a large quantity of viscid mucus in the trachea and bronchia; and the removal of this obstacle to respiration is the principal object to be gained by the exhibition of emetics. A part of their beneficial influence may perhaps be attributed to the impression they make on the pneumo-gastric nerves in the stomach. They moreover induce a determination to the cutaneous surface, thus exerting a beneficial, derivative influence on the lungs; and also manifest a tendency to disturb the recurrence of the paroxysms. In the whooping cough of infants, they are especially called for; their strength is insufficient to expel the viscid mucus, which sometimes accumulates to such a degree as completely to clog the respiratory passages, when death takes place from suffocation. If, therefore, the cough in very young children is violent, and attended with symptoms of impending suffocation, an emetic should be quickly administered, or the fauces irritated with a feather, so as to bring on speedy vomiting. Sulphate of zinc, by the promptness of its operation, is especially suited to these cases; but I have in general preferred ipecacuanna to any other article of the kind. Dr. Fothergil speaks very highly of the following combination as an emetic in this affection:

℞.	Pulv. chel. cancror.	ʒss.
	Tart. antimon.	gr. ii.
	Misce.	

According to the age of the patient, 1, 1½ or 2 grains of this may be given for a dose. The union of an absorbent with the

emetic has been thought peculiarly beneficial in this complaint. Syrup of squills is another excellent emetic. I have often prescribed it advantageously, united with a small portion of antimonial wine. The antimonial wine, combined with an emulsion of assafœtida, may be used with considerable benefit as a palliative. Let it, however, never be forgotten, for the sake of the future health of our patient, that weakness and irritation of the stomach are frequent consequences of too long a persistance in the use of emetics, particularly those of the antimonial kind.

Some of our most valuable remedies for the treatment of whooping cough are found among narcotics. The *belladonna*, particularly, has been highly celebrated, and is without doubt by far, the best article of the kind we possess. Professor Borda was the first, I believe, who used it as a remedy in this affection, and his belief in its efficacy is almost unlimited. According to his declaration, in numerous instances every symptom of whooping cough was removed in ten or twelve days by its exhibition; and where it failed to eradicate entirely the complaint, it almost always mitigated in a marked degree its severity. Cases came under his notice, that appeared to be beyond the power of medicine, and yet were relieved by this remedy. Hufeland and Alibert are almost equally decided in their praise of the virtues of this article; and the testimony of many other writers, together with a large mass of evidence adducible from the current medical publications, might be added to establish still more firmly the fact of the efficacy of belladonna in this singular malady. My own experience leads me to testify confidently on this point. I have prescribed it within the last six years, in perhaps twenty cases, and in the majority of them with evident advantage. Since the publication of my work on the materia medica, my good opinion of its powers has been increased. In two cases, both of an exceedingly violent character, it arrested the disease almost entirely in the course of eight days. The principal circumstances that render its exhibition useless or improper, are fever and bronchial inflammation. In these instances, our chief dependance must of course be placed in bleeding general and local, and blisters or frictions with tartar emetic ointment on the

chest. But in the purely spasmodic form of pertussis, when inflammatory action is absent, it is often singularly efficacious.

Dr. Butler speaks highly of the virtues of conium in this complaint, and it once possessed perhaps more celebrity than any other narcotic. It is said to delay the recurrence of the paroxysms and mitigate their violence, and was prescribed by Dr. Butler in every period of the disease, whether complicated or not with other affections. This gentleman states, that he has frequently used the following mixture with marked benefit:

℞ Extract. coni. gr. iii.
Magnes. Sulphat. ℈ i.
Aq. carui. . . ʒv.
Syrup rhad. . ʒi.
M. take 30 drops 3 times daily.

This article has, however, so frequently failed in general practice, that its virtues are not at present very highly estimated by the profession.

Lactuca virosa, hyoscyamus and opium have also been employed as palliatives in whooping cough. Opium has the recommendation of many eminent practitioners, but the general sentiment of the profession is opposed to its employment in this affection. It is objectionable both on account of its constipating effect and its tendency to determine the blood to the brain.

Ledum *palustre*, or marsh cistus, according to Linnæus, is extensively and successfully employed in Westrogotha, as a sedative in whooping cough. This praise of its virtues is supported by Wahlin and other European writers, but I am unable to say any thing concerning it from my own experience.

Antispasmodics are often used in this affection, and at times with temporary advantage. Musk has been frequently administered in every mode and in all proportions, but so uncertain and even contradictory are its effects, that little confidence is now reposed in its efficacy. Assafœtida will occasionally prove quite a valuable palliative, in cases unattended by fever or strong pulmonary irritation. It answers the two-fold purpose of an expectorant and antispasmodic. In a few instances, I have witnessed excellent effects from a mixture of the vinegar of squills and an emulsion of assafœtida.

The violence of the symptoms may sometimes be assuaged

by the use of *expectorants*. The appended mixture, strongly recommended by Dr. Pearson, I have known to give considerable temporary relief.

Tonics have, in many instances, been found useful. Dr. Cullen strongly recommended the Peruvian bark as a very efficient remedy: "I consider," he says, "the use of this medicine as the most certain means of curing the disease in its second stage; and when there has been little fever present, and a sufficient quantity of the bark has been given, it has seldom failed of soon putting an end to the disease. The same remedy is in high repute almost universally among the German physicians, and there can be no doubt that it is frequently very efficacious; but it should not be forgotten, that its good effects are confined chiefly to the latter stages of the disease. In some instances the cough assumes a chronic character, continuing long after the usual period of its termination. These cases are frequently complicated with chronic bronchitis, and must be relieved by the most efficient measures; otherwise the constitution will be undermined, the system worn down, and the patient will die in a state of marasmus or under symptoms of phthisis pulmonalis. Strong doses of cinchona or quinine here, are often peculiarly serviceable. This tonic may also be very beneficial in cases of a purely spasmodic character, when the disease becomes protracted, and is kept up by habit.

Various other remedies have been employed in this affection, such as lobelia inflata, tincture of cantharides, rhus vernix, lead, arsenic, &c.

Of the *lobelia* I can speak from experience, and to its excellent powers in whooping cough I can testify most fully. I have prescribed it within the last five or six years in a very considerable number of cases, generally with some advantage, and in several instances, with the most decided success. It not only

* ℞	Aq. fontanæ . . .	℥i.
	Syrup	ʒiii.
	Sub-carbonat. Soda	gr. xxv.
	Vin. ipecac. . . .	ʒi.
	Tinct. opii. . .	gr. vi.

M. The sixth part every four or five hours is the proper dose for a child between one and two years old.

mitigates the violence of the cough, but abbreviates, I believe, in many cases, the course of the disease. I have generally administered the saturated tincture in union with the syrup of squills in doses of ten drops of each, four or five times daily to a child two years old. I have given indeed as much as twenty drops of the tincture of lobelia, to several children about this age, and have always found it strongly palliative, when it excited sickness or slight vomiting.

Tincture of cantharides is well spoken of by certain writers,* when given to the extent of producing stranguary. Dr. Sutcliff asserts that it will sometimes, in a great measure remove the disease in four or five days. The same practice has the authority of Hufeland and Lettson in its favor. Sutcliff combined it with bark and the camphorated tincture of opium as in the subjoined formula.†

The *rhus vernix* stands upon the authority of many eminent foreign practitioners, and is stated to be a very useful remedy in whooping cough. Dr. Fresnoi asserts, that he has employed the extract of the leaves with decided success. He gave half a grain in half an ounce of syrup, to a child every three hours. According to his statement, the cough generally abated and in most instances, ceased altogether by the time eight or ten doses had been taken. Forty-two children, he adds, were cured at Vallenciennes in 1786, by this practice.

Lead was perhaps first introduced to notice as a remedy in whooping cough, by Dr. Forbes of Edinburgh, who used the liquor subacetatis, or Goulard's extract, and who speaks highly of its success. (Good.) It has obtained little credit in this respect with the profession.

Of the mineral tonics, *arsenic* has been most commended for its powers in this affection. Dr. Ferriar placed much dependence on this remedy in cases unattended with fever. His own experience induces him to state, that "arsenic is the only remedy

* Armstrong, Chambers, Millar, Bucholtz, Lode, and others, speak much in favor of this remedy in whooping cough.

† ℞ Tinct. peruvian spirit ℥i.
Tinct. opii. camph. . ℥ii.
Tinct. cantharid. . ♏ii.
Two drachms of this mixture to be taken thrice daily.

which promises to shorten the disorder effectually." "I have," says he, "employed this article in several cases of infirmary patients with tolerable success; and I have occasionally given it in private practice with so much advantage, that I think it deserving of further trial." I formerly employed this remedy frequently; and in some instances its good effects were obvious. The proper dose for a child, between one and two years old, is two drops of Fowler's solution, twice or thrice daily. I have commonly given it in union with small doses of the extract of belladonna or conium. It should be remembered that, in all cases attended with febrile excitement or bronchial inflammation, its use is wholly inadmissible.

Calomel, in minute quantities, would seem to possess some efficacy in whooping cough. Dr. Gregory states, that he has derived great advantage from small doses of this article, (a grain twice a day) with a few grains of scammony, in the latter stages of the affection, attended with symptoms of marasmus.

When the disease, at an advanced period, becomes complicated with chronic bronchitis, *balsam copaiva* may be employed with good effect. I have prescribed it, in a few examples of this kind, with the most evident advantage; and I am fully persuaded, that no other remedy promises so much as this one, in such cases.

The application of local revellents to the chest or along the course of the spine, has been in vogue a long time, and is justly regarded as an excellent remediate means in the treatment of whooping cough. It is particularly valuable in cases complicated with bronchial inflammation or hazardous sanguineous congestion in the head. Dr. Gregory advises the following embrocation to be used on the chest and along the whole chain of the spine.* Frictions with tartar emetic over the præcordial region, will, in many instances, be greatly serviceable. This practice originated with Autenrierth, and has been extensively adopted by the German physicians. Dr. Meyer, of Minden, speaks highly of sprink-

* ℞ Antim. tart. . . . . ℈ii.
Tinct cantharid. . ʒi.
Aq. rosar. . . . . ʒii. M.

The tartar emetic is to be dissolved in the rose water, and the tincture of cantharides then added to it.

ling a small portion of morphia on the raw surface of a blister raised over the præcordia. He directs a small blister to be applied to this region, and the cuticle being detached, half a grain of morphia, rubbed up with starch, to be sprinkled on the exposed surface. The morphia is to be repeated every evening; and, if necessary, the blister may be applied every third day. Five cases, according to his statement, were so far relieved by this treatment in the course of eight days, as to require no further attention. When pneumonic affections complicate the disease, blisters and rubefacients, in conjunction with venesection and especially *leeching* on the breast, are indispensable.

Inhalations of various kinds have been used with considerable success in this disease. The fumes of tar are said to be productive of excellent effects, in cases unattended by inflammatory symptoms, and where a great accumulation of mucus in the bronchia exists, giving rise to extreme difficulty of breathing. Immediate and copious expectoration and relieved respiration are sometimes the direct effects. The nitrous acid vapour has also been particularly recommended, and I have myself employed it in a few cases with some benefit.

Change of air and exercise by gestation have generally an excellent influence in tedious and obstinate cases, attended with much exhaustion. In instances of this kind, a change of air, says Dr. Gregory, "is often the only thing that gives the patient a chance of life." I have seen one very remarkable recovery effected by removal to the country and the free use of milk diet. This measure is inadmissible in cases attended with bronchial inflammation, as it rarely fails to aggravate the symptoms immediately. Cold bathing, according to the experience of some, is a very certain and prompt remedial agent; especially where, from never having been used before, it introduces a new action into the system. A limestone soil would seem to exert a very beneficial influence in the cure of whooping cough. Dr. Ferriar says, that he has had "an opportunity of verifying this fact in some very striking instances."

The diet should be light and digestible; and it is particularly important to guard the patient against the influence of a cold, variable and damp atmosphere.

CHAPTER XXXIX.

CONVULSIVE AFFECTIONS OF INFANTS.

At no period of life are convulsions so apt to occur as during the age of infancy. With a nervous system peculiarly excitable, infants are subject to so many sources of permanent and transient irritation, that a very large portion of them suffer more or less from convulsive affections; and these constitute an alarming proportion in the catalogue of fatal infantile maladies. According to the statement by the late Dr. Clark of Dublin, it appears that of 17,650 children born in the Dublin lying-in hospital, one sixth part died during the first year; and of those who died, nineteen out of twenty perished by convulsions. This proportion of mortality from convulsions, however, very greatly exceeds that which a similar estimate drawn from private practice would yield. Still the frequency and fatality of this affection, under its various forms, is by no means inconsiderable in every rank of society, and under every variety of climate, and external circumstances. Both the anatomical and physiological peculiarities of the infantile system, are indeed such as to account for the especial aptitude to convulsive maladies during this tender period of life. The mind and body of an infant, not yet inured to the impressions of internal and external causes, possess the most lively susceptibility to the various perturbating and exciting influences to which it is unceasingly subjected.

All children, however, are not equally disposed to convulsions. Mr. North observes that "the children of parents who marry at too early or too advanced an age, are more susceptible of convulsions than the progeny of those persons who marry in the prime of life." I have met with several, very striking instances of aptitude to convulsions in families which accord entirely with

this observation. That the predisposition to convulsive affections is sometimes hereditary, appears to be highly probable. Boerhaave and Lorry, mention instances which strikingly illustrate this fact. We often meet with families, in which the occurrence of convulsions, is almost a matter of course in all the children as they successfully pass through the process of primary dentition; and on the other hand, in very many families, blessed with a numerous offspring such affections never occur, although the ordinary exciting causes, may be conspicuously present. It would appear also, that convulsions are much more common in cities, and particularly in the higher and more luxurious classes of society, than among those who "are regular in their mode of living and who enjoy the calm tranquillity of a country life." The fresh and pure air of the country, has an especial tendency to invigorate the infantile system, and to diminish nervous irritability, and thus to render the ordinary causes of convulsions less apt to excite such affections. It is, probably, mainly, from the want of pure and wholesome air in hospitals, that convulsive diseases are so much more common in these institutions than elsewhere. The children of mothers, endowed with a very susceptible, physical and moral constitution—with a quick and lively imagination, great sensitiveness, and mobility of temper, are in general peculiarly apt to suffer convulsive affections, during the period of dentition. Mauricean, Leuret, and others, assert, that children who have very large heads are more liable to convulsions, than those who are less liberally furnished in this way. This observation, however, appears to be wholly without any foundation, with regard to children who are healthy. "In ricketty children the size of the head is disproportionally large; and from the general symptoms of rachitis, it is evident that the head and spinal marrow are considerably affected; the brain increases rapidly in size, the senses are usually very acute, and convulsions are very frequent attendants of this distressing malady. It not unfrequently happens, when some children of the same parents are affected with rachitis, that others who are exempted from the disease are at a very early age destroyed by convulsions.* (North.)

* Dict. des Sciences Medicales, tome xlvi. p. 602.

Whatever may be the source and nature of that condition of the organization which predisposes to convulsive affections, the following circumstances may be regarded as characteristic of "that state of increased irritability, from which their occurrence is to be anticipated. The child is more restless than usual and is apt to start at the most trifling noise. During sleep, he often starts up and cries out suddenly; or he remains restless and almost entirely without sleep throughout the greater part of the night. His natural temper undergoes a change. He becomes peevish, fretful, and discontented; "quarrels with his companions, and derives either no pleasure at all, or but a momentary amusement from his most favorite playthings, which he will suddenly thrust away, after they have for a moment occupied his attention." The pupils are very variable—being often extremely contracted for a moment, and then suddenly dilated to an unusual degree. "I have frequently," says Mr. North, "held a candle close to the eyes of a child when I have anticipated convulsions, in order to remark the effect produced. In some instances, where the pupils had been much contracted at the moment the light was applied, it has suddenly dilated, and as suddenly again contracted, although the light was steadily held close to the eye. The effect of light upon both pupils is not always similar. One may remain fully dilated, while the other contracts. I am inclined to believe from frequent observation, that when a light is applied close to the eyes, and the same effect is not produced upon both pupils, that we have much reason to fear some serious affection of the head." Children who are strongly disposed to convulsions, are apt when asleep, to lie "with their limbs almost rigidly extended, the great toes and thumbs being turned inwards." (Good.) The color and expression of the countenance, varies frequently. At one moment it is pale languid or anxious, and at another flushed and animated. Respiration is irregular, and frequently interrupted by long and deep inspirations, succeeded by "a short and catchy breathing." This disordered respiration, in connection with the preceding train of phenomena has been considered as peculiarly indicative of approaching convulsions. "If we observe the fingers of a child, highly disposed to convulsive diseases, we

shall see them either in frequent and sudden motion, or firmly pressed towards the palm of the hand. The thumb is more frequently contracted upon the palm, the fingers at the same time being extended and separated from each other."

Every part possessing muscular fibres, is liable to become affected with spasmodic or convulsive contractions. The parts, however, which are most frequently the seat of convulsions, are the face, the superior and inferior extremities and the respiratory muscles. The countenance is always more or less distorted; and in some instances the convulsive attack is almost entirely confined to the muscles of the face. In some instances, the different parts of the body are separately and successively affected; in other cases, the whole system of voluntary muscles, are simultaneously thrown into convulsive agitation. "The most common form of convulsion" (says Dr. Clark) "is that in which there is a universal spasmodic contraction of all the voluntary, and many of the involuntary muscles, of the body, accompanied by foaming at the mouth, protrusion of the tongue, staring of the eyes, distortion of the eye-balls, laborious and obstructed respiration, sometimes accompanied with a violent redness of the face and scalp in the beginning of the paroxysm, followed by a purple color of the whole body at the end of it. This latter symptom sometimes continues until the child dies."

The redness of the face and scalp, and the foaming at the mouth mentioned by Dr. Clark, are, however, not very common in cases of simple convulsions. These symptoms are more particularly connected with epilepsy and convulsions depending on organic affections of the brain. It is a remarkable fact, that simple convulsions seldom occur at night, while the child is sleeping; and in this respect, they differ very materially, from epilepsy, which in a great many instances comes on only at night.

Causes.—It is asserted, by many writers, and doubtless very correctly, that the occurrence of convulsions among children is much more common at the present day, than at any former period. This has been ascribed to the increase of luxury and refinement, of late years, and particularly to the vicious system

of educating infants so prevalent in modern times. Unquestionably nervous and convulsive diseases "have increased in proportion as polished education has removed children from bodily freedom, and carelessness of mind, which to a certain extent are so essentially necessary to the preservation of their health." Among the Indian tribes of this country, it is said that convulsions are scarcely known; and among the industrious and frugal inhabitants of the country, where children enjoy an abundance of healthful exercise, and a plain but wholesome diet, convulsive affections are very uncommon. The practice, so much favored at the present time, of urging the tender minds of infants, to premature efforts in the acquisition of knowledge, is liable to very serious objections. That it must tend to weaken the general organization, and predispose to bodily infirmities, can hardly be doubted. "It may be a source of consolation to those parents, who are too apt to lament any apparent loss of time in the very early periods of life, to remember, that early acquirements, are not to be gained, without much risk of impairing health; and that the future progress and mental powers of the individual depend upon the foundation which is laid in infancy, by judiciously adapting the studies of the child to its age and constitution. By premature efforts to improve the mind, the brain and nervous system becomes over excited, exhausted and finally enfeebled. The practitioner, therefore, cannot too forcibly reprobate precocious studies. The injurious effects arising from the vanity of parents, who are ambitious of holding forth their children as specimens of extraordinary talents, are constantly presenting themselves to our view, in a train of nervous symptoms, and of susceptibility to ordinary impressions, which frequently lead to decided paroxysms of convulsions." (North.)

The exciting causes of convulsions are extremely various. In general, whatever is capable of causing strong sanguineous determinations to the brain, or of producing nervous irritation of the organ may give rise to an attack of convulsions. The vascular turgescence within the head, which in adults causes coma, or apoplexy, is apt, during infancy, to produce convulsions. Even a moderate degree of sanguineous engorgement of the

brain is often sufficient to produce convulsions, in children, who are predisposed, by constitutional habit, or previous enervating causes, to the affection. This is often illustrated by the occurrence of strong convulsions in fevers of strong vascular reaction, and particularly in the cold and sometimes in the hot stage of intermittents. In infants the paroxysms of an ague are very often ushered in by convulsions. I have met with cases in which the convulsions came on regularly, at the same hour, for four or five days, before the nature of the malady was understood.

In some instances, however, convulsions are the immediate consequence of cerebral or nervous irrritation without any extraordinary sanguineous determination to the head; and these are, in general, the most serious and unmanageable cases. This cerebral irritation is usually purely sympathetic, depending on a primary local irritation seated either in the alimentary canal, or in some other part, more especially in the gums from dentition. It must be observed, nevertheless, that both intestinal irritation and dentition are very frequently attended with an increased determination of blood to the brain; and the latter, especially, is very rarely unaccompanied by this additional source of cerebral disturbance.

When an attack of convulsions is preceded and attended with a flushed and turgid countenance, dilated pupils, a full and active, or a contracted, frequent and tense pulse, with strong beating of the arteries of the neck and temples, and a warm and dry skin, we have conclusive evidence that the cerebral irritation which causes the convulsions is mainly, if not wholly, produced by vascular turgescence in the brain. In such cases, the child generally remains in a lethargic state, for a longer or shorter time after the subsidence of the convulsions. When, on the contrary, the countenance is pale and the pupils contracted, the skin cool or of the natural temperature, the pulse small, frequent, quick and irregular or feeble, we may infer that the attack is not dependent on sanguineous irritation of the brain, but the result of nervous irritation, transferred to the common sensorium, most probably from a primary nervous irritation located in the intestinal canal. There is no cause to which

infantile convulsions, are more apt to be ascribed, than *worms*. That verminous irritation is capable of exciting convulsions, admits, indeed, of no doubt; but, I am persuaded, that the instances which depend upon this cause are, of comparatively rare occurrence; and this accords with the observations of many of the most experienced writers on this subject. "In common" says Mr. North, "with every other practitioner who has had opportunities of seeing much of the diseases of children, many worm cases have fallen under my notice; and I do not remember a single instance where convulsions appeared to depend upon the presence of worms in the intestines, or to be relieved by their being discharged." My own practice has furnished me with but few instances of convulsions, that could be fairly ascribed to verminous irritations.

Errors in diet, with regard, both to quantity and quality, are unquestionably by far the most common sources of convulsive affections, in infants; "So long as nurses and mothers believe that children thrive in proportion to the quantity they eat, so long will convulsive diseases be frequent and severe." Over distention of the stomach, with inappropriate articles of food is peculiarly apt to give rise to convulsions. I have known several fatal attacks of this affection, brought on by eating raisins, during convalescence from slight febrile complaints. Children whose digestive powers are feeble, or who are affected with a disordered state of the bowels, are peculiarly liable to convulsions, from the reception of substances of this kind into the stomach. During dentition, especially, the utmost care should be taken to prevent errors of this kind; for I am entirely convinced, that many of the cases that are usually ascribed to dental irritation, are the result rather of gastro-intestinal irritation from errors in diet or improper ingesta. An instance which I recently saw, brought the truth of this observation forcibly to my mind. The child had for several weeks been a good deal disturbed by painful dentition. While amusing itself with its play things it was suddenly seized with a violent paroxysm of convulsions. In a few minutes, it threw from its stomach a large quantity of fluid, containing a mixture of almonds, raisins and sponge cake. I administered an emetic,

and brought away no inconsiderable quantity of the same destructive mixture; after which the convulsions gradually subsided.

Repelled cutaneous eruptions and suddenly suppressed discharges from ulcers or sores, particularly about the head, or behind the ears, may give rise to convulsive affections. Mr. North doubts, "whether convulsions were ever produced either by the natural or artificial disappearance of cutaneous discharges or eruptions, provided, that a slight action was kept up, for some time upon the bowels, by the assistance of purgatives, and their effect was not allowed suddenly to subside." Undoubtedly, by such precautionary measures, the ill effects of drying up discharges or repelling eruptions, may generally be obviated; but my experience warrants me to say, that even this course of management will not always suffice to prevent the occurrence of convulsions. It must be observed, however, that children who are not under the influence of difficult dentition, seldom suffer any particular disturbance, from the desiccation of cutaneous discharges; but during the active progress of teething, attended with a general irritative condition of the system, it would most assuredly be extremely hazardous, to dry up serous discharges behind the ears, even though the bowels be regularly acted on by aperients. It does not appear, however, that the sudden drying up of scabby or suppurative eruptions, has any obvious tendency to excite convulsive affections. It is to sores discharging a serous fluid that these observations more especially apply. *General plethora*, with a predisposition to irregular sanguineous determinations to the brain, may, doubtless, contribute very materially to the occurrence of convulsions. It is, however, to be regarded, rather as a strongly predisposing or accessary, than an *exciting* cause of such affections; for it may be doubted whether mere plethora, ever produces simple convulsions, without the concurrence of some other cause capable of producing a preternatural determination of blood to the head, or causing cerebral irritation. *Dentition*, is incomparably the most frequent source of convulsive affections during infancy. In many instances, it is manifestly the sole cause of the convulsive paroxysm; but it frequently operates only as a strongly *predisposing* cause, in consequence of

which, slight additional sources of irritation may bring on an attack of convulsions. Convulsions not unfrequently occur in the acute exanthematous affections, either just before the eruption is about making its appearance, or in consequence of the sudden repercussion of the exantheme, before the period of its regular declension. Convulsions may also be excited by a direct or mechanical injury of the brain. I have known several instances where a fall on the head so as to cause considerable concussion of the brain, almost immediately gave rise to general convulsions, without any permanent or fatal lesion of the brain. Even severe local injuries, of parts situated remote from the encephalon will sometimes excite an attack of convulsions. "Infants," says Mr. North, "are liable to convulsions, almost immediately after birth; and it cannot be doubted, that they occasionally arise from excessive and long-continued pressure of the head, during protracted labor." Convulsions depending on this cause, seldom continue longer than a minute or two.

In some cases, a slow and insidious inflammatory irritation will go on in the brain, or its meninges, with scarcely any decided symptoms of disease, until either an effusion of serum upon the surface, or into the ventricles of the brain or some other cerebral lesion is effected. In cases of this kind, a paroxysm of convulsions is sometimes the first unequivocal intimation of the child's indisposition; and what was previously considered as mere fretfulness and general irritability of temper, of no serious import, now suddenly assumes the character of an almost hopeless form of cerebral disease. Cases of this kind, however, are almost invariably connected with more or less paralysis, and frequently with strabismus, and must be regarded rather as insidious instances of hydrocephalus or of cerebral inflammation, than as convulsions of the ordinary form, of which I am now speaking.

Convulsions, may, moreover, be the result of *moral causes*. The emotion of fear or violent alarm, when suddenly excited, is capable of producing the most violent effects upon the irritable and sensitive frames of children. Mr. North, states that an instance occurred to him, in which a child of four years of age, "who had never previously been affected with convulsions, was

suddenly attacked with a violent paroxysm which destroyed him, in consequence of the nurse having improperly threatened to throw him from a window, if he did not cease crying." An instance occurred to me about ten years ago, in which a child about six years old, was thrown into an extremely violent and protracted paroxysm of convulsions, by her sisters suddenly appearing before her, in a frightful mask.

It is a remarkable fact, that violent mental emotions or excessive bodily fatigue on the part of the nurse, sometimes produces the most alarming effects on the system of the suckling infant. A striking case, in point, is related in one of the early numbers of Hufeland's Journal. A woman, immediately after a vehement burst of rage, put her infant to her breast. In less than twenty minutes the child was seized with a violent paroxysm of convulsions, although it had previously been wholly free from any manifestations of ill health. Mr. Gillibert, mentions the case of a child who died of convulsions, "after having sucked a nurse who had been exposed to hard labor under a burning sun;" and Boerhaave, has given an account of two instances of epilepsy, which were in the first place excited, by being suckled immediately after the nurses had been under the influence of violent fits of passion. Baumes, also, states, that one of his professional brethren had lost an infant suddenly by convulsions, in consequence of having been suckled by a woman soon after she had been violently exasperated. Many more instances, of a similar character might be collected from authors; and although an infant may be affected with convulsions, under circumstances of this kind, from causes wholly independent of the nurse, there can be no doubt, that the most serious consequences may sometimes result to the infant, by being suckled by a woman of an impetuous and ungovernable temper.

The Prognosis of infantile convulsive affections must depend mainly on the nature of the exciting cause, and the violence and duration of the attack. Cases arising from a primary irritation located in the alimentary canal, or from the irritation of dentition, are, *cæteris paribus*, always less dangerous than instances depending on a primary irritation or lesion of the brain, or its spinal prolongation. Even purely sympathetic irritative con-

vulsions, arising from intestinal or dental irritation, may terminate fatally, by the shock and structural lesion which the brain may receive from the violent determination of blood which in some instances takes place to the vessels of the encephalon. This is more particularly apt to be the case in children of a corpulent and very plethoric habit, and where the convulsive attacks are of a protracted duration. In ordinary habits, there is but little to be apprehended from convulsions during infancy, when the attacks are slight and of short duration; and this observation applies especially to those instances which, instead of leaving the infant in a dull and lethargic condition, are almost "immediately succeeded by the natural cheerfulness of the child." (North.) When death occurs suddenly during a paroxysm of convulsions, we almost always perceive manifest signs of strong sanguineous congestion in the vessels of the head,—such as a darkish and turgid aspect of the face, fulness of the veins of the neck and head, heavy and almost stertorous breathing; and in such instances, the little patient dies "in a state nearly allied to apoplexy in the adult." The reviewer of North's excellent treatise on this affection, asserts that he has made more than thirty dissections of children who had died of convulsions, and that he invariably found the vessels of the encephalon strongly engorged with blood, attended with more or less serum in the ventricles of the brain; and, in several cases, "considerable extravasation of blood from a ruptured vessel" was detected. When paralysis and squinting occur, the most serious cerebral lesion may be inferred, and the prognosis is, of course, of the most unfavorable kind. Convulsions that come on suddenly, without any premonitory symptoms, are, in general, much more apt to terminate favorably, than those cases which supervene after a considerable period of slight indisposition—such as great fretfulness, starting from sleep, grinding the teeth, occasional flushes on one or both cheeks, a variable appetite, deranged state of the bowels, &c.

Treatment.—It has been doubted whether any course of treatment during the convulsive paroxysms, is capable of shortening its course, although it might mitigate its violence and, perhaps, obviate a fatal termination. In general this is unques-

tionably the case; yet I am inclined to think, that in some instances, the paroxysm may be shortened, as well as moderated in its violence, by appropriate remedial applications.

The chief indications to be attended to in the treatment of convulsive affections are: to obviate, as far as may be in our power, the influence of the remote or exciting cause; to allay cerebral and general nervous irritation; and especially, to counteract the preternatural determination of blood to the brain.

When called to a child affected with convulsions, its gums should be immediately examined. If they present a swollen and inflamed or irritated appearance from teething, they should be at once freely divided down to the advancing teeth. This measure can never be omitted, where the gums are distended and irritated without the most culpable neglect. Care should be taken that the incision be sufficiently deep to divide, completely, the firm membranous expansion which covers the crown of the approaching tooth; for a mere superficial division of the gums, can afford but very little or no benefit.

Should there be reason to believe, that the convulsions are the consequence of an oppressed state of the stomach from crude or indigestible ingesta or acrid secretions, immediate steps should be taken to remove the offending cause. If any unusual food, or substances of difficult digestion have been received into the stomach a short time previous to the occurrence of the convulsions, it will be proper to administer a full dose of ipecacuanna, in order to evacuate the contents of the stomach as speedily as possible. To remove the irritating matters that may be lodged in the intestines, purgative enemata, should be freely administered. In all instances, indeed, stimulating injections are decidedly proper, and whatever other remedies may be employed these, if the necessary means are at hand, should never be neglected.

Blood-letting, though not always applicable, is in some instances a very important auxiliary in the management of these affections. A principal object in the treatment of convulsions is to protect the brain from fatal oppression: and for this purpose bleeding is one of our most efficient means. Where the signs of

strong determination to the head are manifest—and especially in robust and plethoric children, blood should be promptly abstracted. On the contrary, however, it will be prudent to abstain from this evacuation in patients of a weak and relaxed habit, and, where the ordinary evidences of vascular engorgement are absent. With regard to *local* bleeding, by *leeches* to the head, my own experience accords entirely with the following observations of Dr. North. "I have never seen well marked symptoms of determination to the head in children removed by leeches, however freely they were applied. Their application never fails to annoy the little patient considerably, and their effect is not to be relied on." If it be deemed necessary to draw blood directly from the vessels of the head, this writer recommends bleeding from the jugular vein, or by cupping upon the temples or behind the ears. In cases where the little patient sinks into a state of coma, with flushed countenance, throbbing of the carotids, &c. after an attack of convulsion, local depletion, in any of these latter muscles, is sometimes indispensable to the safety of the patient's life.

Révulsive applications are among the most useful remedies we possess for moderating or arresting convulsions. *Warm pediluvium*, the water being as warm as can be borne without injuring the skin, is one of the most beneficial of this class of remedies. This measure is particularly apt to afford relief in convulsions excited by the irritation of difficult dentition. The good effects of warmth applied to the feet, are always much enhanced by cold applications to the head. While the feet and legs are immersed in warm water, a piece of flannel, wet with cold water, should constantly be applied over the head and temples. These measures are especially important in cases attended with symptoms of sanguineous congestion in the head, and cannot be omitted without losing one of our most efficacious remedies in such affections. Not unfrequently, these applications, moderate the violence of the convulsions at once, and bring them to a speedy and favorable termination. "In many instances," says Mr. North, "I believe I have rescued children from a state of great danger, by the incessant application of cold to the head." While these applications are being made, "the countenance and pulse should be attentively watched. When paleness and collapse of the

face supervene, and the pulse declines or intermits, the cold applications should be suspended, and the head and trunk covered with a dry cloth; but as soon as signs of reaction return, the process is to be resumed even to the third or fourth time, till its good effects shall be decisive and manifest in the suppression of all convulsive motions." The French and German physicians, frequently employ the warm bath, immersing the whole body; while ice is applied to the top of the head. I am inclined to believe however, that more benefit may in general be derived from merely placing the inferior extremities in the bath; for the tendency of general immersion in the warm bath, to increase the flow of blood to the head, is always very considerable; whilst the application of warmth to the inferior parts of the body, often exerts a powerfully derivative effect upon the turgid vessels of the head. Dr. Currie, in his valuable work on the use of cold water, asserts from much experience, that *cold* effusions are highly efficacious in removing the convulsions of children, from whatever cause they may arise. I have witnessed one instance in which this remedy was tried, and the result was highly gratifying. When the countenance is flushed and turgid, the surface warm, and the pulse full and active, there can be no doubt, I think, of the usefulness of cold effusions. The child's head should be raised and the water poured on it, out of a pitcher. In cases of an opposite character, however, that is, where the face is pale, the extremities cool, and the pulse small, the practice would, probably, be attended with very serious mischief.

Counter-irritating applications, also, are decidedly indicated. Blisters are in general too slow in their effects to derive any particular advantage from them during the paroxysm. Nevertheless, where there is reason to apprehend a repetition of the attacks, small blisters laid behind the ears or on the back of the neck, may afford considerable benefit. Vesication on this part is particularly calculated to afford advantage in those cases which supervene, on the drying up of superficial and discharging ulcerations behind the ears. Some benefit may be also expected from the application of blisters to the inferior extremities. Dr. Clark strongly advises the application of vesicatories to the calves of the legs; and Dr. North asserts that in many cases attended

with strong determination of blood to the head "*without any general vascular excitement*," he has obtained the best effects from this practice. The common practice of applying blisters to the scalp, in diseases of this kind, is by no means advisable. They not only almost invariably fail of doing good, when applied in this way, in any of the inflammatory or congestive affections of the brain, but often prove decidedly prejudicial. In hydrocephalus, for instance, I have never known even the slightest temporary advantage to result from vesicating the scalp. *Sinapisms*, are in general more beneficial, as counter-irritating applications, than blisters. Their operation is prompt and energetic, and when applied to the inferior extremities, or *along the tract of the spine*, they often contribute, very materially to the reduction of the vascular excitement of the brain. "In my opinion," says Dr. Clark, "we have too little confidence in the powers of sinapisms applied to the feet, where there is a great degree of cerebral excitement to be contended with. In many cases, both of children and adults, I have found them to be very powerful auxiliaries."

Much benefit may also be derived from rubefacient frictions,—particularly along the course of the spine. I think I have seen much advantage obtained from frictions over the spinal regions with a mixture of equal parts of the oil of amber, laudanum, and spirits of camphor. I seldom omit this application in the convulsions of very young infants, and I feel confident it has frequently been of much service. When the convulsions assume a tetanic character—the body remaining for some time, rigidly bent backward, leeching, and sinapisms, over the spinal region, would seem to be especially indicated. Indeed, in all instances, counter-irritating applications along the tract of the spine, are appropriate, and calculated to do good.

Purgatives, if they can be introduced into the stomach, ought, in no instance to be omitted. In cases depending upon intestinal irritation from acrid secretions, or other offensive matters lodged in the alimentary canal, free purgation may be deemed indispensable. Calomel in combination with jalap, or where there is reason to suspect verminous irritation, a strong infusion of senna and spigelia, are very suitable remedies for this purpose.

Some practitioners are in the habit of giving large doses of

calomel, in the convulsions of infants, under an idea that there is something peculiarly beneficial in the operation of this article in affections of this kind, and I am inclined to think that this opinion is well founded. Dr North, however, objects strongly to this practice, as tending in no small degree to injure the constitutions of children. That calomel is too heedlessly and indiscriminately given in the affections of children, particularly in the United States, I have not the smallest doubt. I am quite certain, that I have seen instances where this practice was the cause of great and irreparable constitutional injury. Nevertheless, it has appeared to me, that one or two active doses of this article, so as to cause free alvine evacuations, is capable of procuring more advantage, in general, in the convulsions of infants, than any of the other usual means for evacuating the alimentary canal. Indeed, it has seemed to me, that even where the calomel fails to excite purging, or before this effect is produced, considerable benefit sometimes results from its immediate impressions on the nerves of the stomach. Dr. Brachet,* who appears to have had very extensive experience in affections of this kind, strongly recommends the use of calomel in combination with the extract of henbane in infantile convulsions. To a child of two years old, he gave two grains of calomel every two hours, and one grain and a half of the extract of black henbane every half hour, with the happiest effect. I have myself, in a few instances of obstinate convulsions, used this combination, and in one case at least, with unequivocal benefit.

Formerly, physicians were much in the habit of exhibiting antispasmodics in infantile convulsions—such as assafœtida, camphor, valerian, musk, and ol. succine. In children of very nervous or irritable habits, some benefit may occasionally be derived, during the fit, from assafœtida, musk, or the oil of amber, provided no signs of determination to the head be present. Upon the whole, however, these are, under the most favorable circumstances of very equivocal propriety; and they are decidedly improper, where the arterial reaction is considerable, and the vessels of the head engorged.

* Memoire sur les Convulsions des Enfans. Paris, 1824.

Opium is a remedy that may, either do very serious mischief or no small degree of good, according to the particular state of the system, and the character of the attending circumstances of the cases. In instances attended with febrile irritation, and a strong determination of blood to the brain, nothing perhaps would be more likely to do harm than opium, more especially in robust and plethoric subjects. In general, wherever local or general depletion is indicated, opiates may be regarded as improper. On the contrary, however, where convulsions arise symphathetically, in consequence of some remote and fixed irritation—as in the alimentary canal, and the habit of the patient is irritable, relaxed, and feeble, opium, judiciously administered, may afford decided benefit. It is indeed, *anceps remedium*, but the practitioner, who has learned to discriminate between the circumstances that indicate or contra-indicate the propriety of its use, will often find it a most valuable auxiliary. In general, it is altogether inadmissible in convulsions arising from the irritation of dentition; and in cases depending on causes seated within the head, it is, if possible, still more inappropriate. When the primary irritation is located in the alimentary canal, we may, under the other favorable circumstances just mentioned, employ small doses of Dover's powder, repeated according to the exigencies of the case, with manifest advantage. Opiate embrocations over the chest and spinal region, will also, in such cases, afford benefit. These are particularly useful, where from great nervous irritability there is a strong tendency to convulsive attacks, unaccompanied with general, vascular irritation. In that irritative condition of the system to which Dr. Nicholl has applied the term "*cerebral erethism*," and which, if not subdued, almost invariably terminates in some form of convulsions, opiates in alternation with laxatives, are in general decidedly beneficial. When the child is sleepless at night, and unusually peevish and fretful during the day, with a small and rapid pulse, a pale and anxious expression of the countenance, slight twitchings of different muscles and tendons, the carotids, beating violently for a moment and then suddenly subsiding into languid action, sudden starting, agitation or tremor, from slight causes;—in this condition, depletion is generally injurious, and nothing affords so much relief as narcotics. Brachet recommends the em-

ployment of henbane, but I doubt whether we possess any article of this kind more appropriate and beneficial than Dover's powder, given in small but repeated doses in union with small portions of calomel, and with an occasional laxative enema. Mr. North states, that in cases of this kind, he has frequently given the extract of hemlock or of henbane in conjunction with alkalies, with great advantage.

The German physicians are much in the habit of administering the *oil of valerian*, in convulsive affections, unconnected with febrile irritation, or independent of local disease. I have known very considerable advantage derived from this remedy, in cases attended with great irritability of the nervous system, and a pale and contracted appearance of the countenance. In convulsive affections arising from verminous irritation, with a languid and relaxed state of the system, I am inclined to regard this remedy as entitled to much attention.

In cases attended with prominent gastric derangement and acidity of the primæ viæ—instances of which are frequently met with in very young infants, *alkine remedies* are especially indicated. Three or four grains of the bi-carbonate of soda dissolved in a teaspoonful of the syrup of rhubarb, with a drop of the oil of valerian, forms an excellent remedy in such cases. The *oxyde of zinc* also, has been much employed in the convulsive affections of children. Mr. North states that he has frequently prescribed this remedy, "and in many instances with much advantage." In cases wholly independent of organic disease or unconnected with febrile irritation, this article will occasionally do much good. Dr. Brachet considers it among our most useful remedies, in cases recurring from the force of habit and from inordinate nervous irritability. He recommends it to be given in union with cicuta or henbane. He relates several cases, in which the protracted use of this combination, entirely prevented the repetition of the convulsive paroxysm, and "to which the children had been subject for a very considerable time."

To mitigate the violence of the convulsive paroxysm, some writers recommend pressure upon the epigastrium, as almost invariably beneficial. Dr. Brown,* asserts, that a gradually in-

* Journal Gen. de Medecine, tome xxxi. p. 437.

creased pressure upon the region of the stomach with the hands, usually relieves the struggles in a remarkable manner. If the pressure is suspended for a moment, "the convulsions will return with increased violence," but on renewing the pressure, the struggles are again speedily moderated.

Mr. North, states, that in several cases attended with "every symptom of approaching convulsions," the experiment of compressing the carotid arteries, as recommended by Dr. Parry in the treatment of adults, has appeared to him to have had a most excellent effect. "It is certainly to be regretted," he says, "that the plan is not more frequently adopted in the cerebral derangements of children which threaten to produce convulsions, but which do not either demand or justify the abstraction of blood." Dr. Blaud has published an interesting paper, from which it appears that he has employed compression of the carotids, in children "with the most gratifying result." There can be no doubt indeed that in cases attended with undue determination of blood to the brain, much benefit must result from this practice. It is extremely difficult, however, in most children to apply sufficient compression to the carotids, to produce any obvious effect upon the cerebral circulation. Where it is practicable it may be resorted to with great propriety, and probably with much advantage to the patient.

CHAPTER XL.

INFANTILE EPILEPSY.

Epilepsy is a disease of frequent occurrence in children. It is liable to be confounded with simple convulsions, but the following circumstances will, generally, enable us to distinguish them without much difficulty or risk of mistake. In the epileptic paroxysm there is a total abolition of the senses, from the commencement to the termination of the attack. In simple convulsions, on the contrary, "the senses are only abolished during the violence of the fit, and some degree of consciousness is manifested when the paroxysm is mitigated, and, often long before the convulsions have entirely subsided." Epileptic convulsions almost invariably terminate in a deep stupor, from which the patient awakes in a state of confused and stupid surprise, or with a dull, heavy, and fatuous expression of the countenance. In simple convulsions this rarely happens, except in cases of extreme violence, attended with sanguineous congestion in the brain.

The predisposition to epilepsy is sometimes *hereditary;* and when this is the case, almost any thing which is capable of disturbing the natural actions of the system, may excite the disease. Boerhaave, mentions an instance, in which all the children of an epileptic father died of this disease, and Stahl has related a similar occurrence. Tissot, also, mentions a remarkable instance of this kind. An epileptic man had eight sons and three grandsons, all of whom, he says, became affected with this disease. The *exciting* causes of epilepsy do not differ from those which produce simple convulsions, and as these have already been described in the preceding chapter, it is unnecessary to repeat them in this place. Many of the epileptic affections of children, commence, in the form of simple convulsions, which by repeated recurrence and mismanagement ultimately acquire a strictly epileptic form. "It is to be remembered, that however trifling may be the original

convulsive affection, if it is frequently repeated, and the patient is of a highly susceptible disposition, it may gradually increase in severity, until it, at length, degenerates into pure epilepsy.

In children, perhaps the most fertile source of epilepsy may be traced to derangement of the stomach and bowels, from which, at first slight attacks of simple convulsions may succeed, which ultimately acquire the character of epilepsy; or an epileptic paroxysm at once occurs, without any convulsive malady of a milder nature."

On the subject of the *proximate cause* of epilepsy, very discrepant opinions have been expressed by pathologists. Without entering into a detail of these opinions, all of which are hypothetical and many of them absurd, I shall content myself with a statement of those circumstances, which experience and observation appear to sanction, in relation to the pathology of this affection.

1. The immediate cause of the epileptic paroxysm, whatever its essential character may be, is always seated in the brain.

2. In the majority of fatal cases, organic and other obvious affections of the brain—particularly of the cerebellum, or of the meninges, are found on dissection, and which we may infer, contributed to the excitation of the epileptic paroxysm.

3. The cerebral affection is in some instances, primary, and the result of causes that act directly upon the brain. In others, probably in the majority of cases, it is secondary, depending on primary irritations located remotely from the brain.

4. Immediately, before the accession of the epileptic attack, it would seem, that vascular turgescence takes place, in the encephalon; and the pressure thus created, in co-operation with the general predisposition to the disease, and the organic cerebral affection, where such disorder exists, is probably the immediate exciting cause of the paroxysm.

The epileptic attack sometimes comes on suddenly without any intimation of its approach. In general however, certain symptoms precede the occurrence of the paroxysm, and of these the following are the most common: a dull heavy pain, or a confused and distressing feeling in the head, giddiness, sparks, or the appearance of light fluttering before the eyes; distention of the veins of the head and neck, a buzzing in the ears, palpitation of

the heart, tremors and an agitated and alarmed appearance, starting during sleep, temporary confusion of mind, great drowsiness, spasmodic twitches of particular muscles, especially in those of the face, sudden pains in the stomach succeeded by nausea and perhaps vomiting, a sudden change of temper manifesting unusual perverseness, fretfulness or passion, a creeping sensation in various parts of the body, and rapid changes in the color and expression of the countenance.

In many instances the epileptic attack, invariably comes on at night while the child is sleeping. When the paroxysm occurs while the patient is sitting or on his feet, he suddenly falls down in a state of insensibility and immediately becomes more or less violently convulsed. In some cases the convulsive actions of the muscles, particularly those of the face are frightfully violent; the whole frame is violently agitated; the eye-lids are in constant motion; the eyes appear to project unnaturally and are fixed, or turned upwards so as to hide the cornea; the face is occasionally pale, but much more commonly, red or livid, "and sometimes almost black," and the veins of the head and neck are excessively turgid. The tongue is often spasmodically thrust from the mouth, and is sometimes severely injured by the teeth, from the forcible and rapid convulsive contraction of the jaws. Sometimes the teeth are firmly fixed, and at others, the jaws are widely and fixedly distended; the thumbs are, generally, firmly pressed in upon the palms of the hands; the head is thrown about in various directions, and sometimes becomes suddenly fixed in one position, from which no force can move it. The spasms are generally of the clonic kind, but in some instances, the muscles remain for a time rigidly contracted, the body being bent, either backwards or on one side, or forwards, as in tetanus. Occasionally the abdominal muscles are violently retracted towards the spine. The respiration is irregular, oppressed and sometimes extremely laborious and even stertorous, in violent cases. The convulsions sometimes subside for a moment, to be again renewed, with undiminished or increased violence. "The same remission of the convulsive movements, occurs also, frequently during the paroxysms of simple convulsions. During this cessation, however, the expression of the countenance, and

the gestures of even a very young child, lead to the conviction that it is sensible of its state of suffering. Not so in the abatement of the true epileptic paroxysm. The child either lies motionless and totally insensible, or rolls its eyes about with a wandering and unfixed gaze, without the appearance of any degree of consciousness." In general, the convulsive actions are more conspicuous on one side of the body than on the other. Towards the termination of the paroxysm, a considerably quantity of a frothy saliva usually flows from the mouth, and in very violent cases, the feces and urine often pass off involuntarily. Sooner or later the convulsions abate—generally gradually, but occasionally quite abruptly. The breathing becomes freer; the pulse which during the fit is irregular, small, and frequent, becomes fuller and more regular; the countenance assumes a more composed appearance, and the patient finally falls into a state of stupor, or deep and heavy sleep, out of which he awakes with a feeling of languor, and confusion or torpor of mind, which generally continues for ten or twelve hours—the countenance exhibiting a vacant and stupid expression, with a dull, staring and wandering appearance of the eyes. In violent attacks, the mind is apt to remain obtuse and fatuous, and the temper irritable and morose, for several days after the paroxysm. During the heavy sleep in which the paroxysm usually terminates, the patient generally perspires freely, particularly about the head, neck and breast, and the perspiration has in many instances a very peculiar, offensive smell.

Epilepsy does not however always exhibit the violence and course of phenomena just described. Sometimes the patient remains fixed in the position "in which he happened to be at the moment of the attack, while the head is moved from side to side with great rapidity, all consciousness being destroyed." Occasionally instead of actual convulsions, there is a trembling of the whole body, with twitching of the tendons, which is succeeded by a tetanic rigidity of the whole frame and total unconsciousness. In some instances the attack supervenes suddenly without any sensations or appearances indicating its approach, and after a few moments of partial convulsions of the muscles of the face and neck, quickly subsides, and restores

the patient to consciousness. In general the disease is much milder in infants before they are weaned, than in children of more advanced age. The symptoms during infancy, are commonly confined "to irregular and rapid motions of the eyes, convulsed contractions of the muscles of the face, blueness of the countenance and contraction of the lower jaw, with abolition of the senses," and their duration is seldom prolonged beyond ten minutes.

With regard to the duration of the epileptic paroxysm, great diversity occurs. The convulsive stage generally continues from five to ten minutes, sometimes for half an hour and occasionally much longer. In infants at the breast, as has just been observed, it is seldom protracted beyond eight or ten minutes; but after the usual period of weaning, particularly when the child is under the influence of painful dentition, the paroxysm is apt to continue a much longer time. In some instances one fit only occurs at a time; in other cases, several paroxysms occur in quick succession, the patient remaining in a state of stupor, during the intermissions. In general the first attacks are much shorter than those which occur after the disease has become confirmed in the system. The contrary, however, generally happens, when the first attack is excited by some sudden and violent mental impression, as terror. Much diversity, also, occurs in relation to the interval between the epileptic seizures. It is asserted by some writers, that epilepsy never occurs oftener than once a day." This, however, assuredly is not correct. I have seen one case, at least, in which two distinct paroxysms at times, occurred in the course of twenty-four hours; and Mr. North assures us that he has "certainly witnessed several epileptic paroxysms," in the same child, in the course of a day. It must be confessed, indeed, that instances of this kind are very uncommon, though the occurrence of a paroxysm daily, is not unfrequent. In general, however, the intervals between the attacks are much longer varying from a few days to several months. In some instances the paroxysms observe a more or less perfect periodicity in their occurrence; but the majority of cases are quite irregular in this respect.

One of the most distressing circumstances connected with this

disease, is its tendency to impair the understanding,—to produce hebetude, and finally even total abolition of the mental faculties—a condition infinitely more lamentable than death itself. Much diversity, however, occurs, in relation to the effects of epilepsy in this respect, in different individuals. Some children will bear repeated and even violent attacks, without appearing to suffer any permanent injury either in body or mind; whilst in other instances the patient is soon destroyed during the paroxysm, "or is reduced to a state of idiotism." In all instances, however, where the disease continues for a long time, the mind is more or less enfeebled, however mild the paroxysm may be.

Epilepsy seldom proves fatal, except through the intervention of *apoplexy*. Although, the immediate danger of an epileptic paroxysm, is not in general very great, yet in relation to the sanability of the disease, the prognosis is always highly unfavorable. Even where a cure or suspension of the disease has been effected the liability to a relapse is always very considerable. I have seen instances where the disease returned after a suspension of its attacks for several years. When epilepsy depends on some organic affection within the head all attempts to effect a cure, must, almost necessarily end in disappointment. In what are called symptomatic cases—that is, where the disease is unconnected with structural disorder, depending solely on morbid predisposition and irritation in the nervous system, a cure may sometimes be effected by an appropriate course of management. After the mental faculties have become obviously impaired, by the repeated attacks of the disease, all hopes of a cure may be abandoned. Experience, too, has shewn that those epilepsies which commence soon after birth, or during early infancy, very rarely yield to remediate treatment. Richter observes that a long continuance of the sleep and subsequent stupor and confusion of mind, after the subsidence of the paroxysm, is a very unfavorable sign. Epilepsy from moral causes, such as terror, is generally extremely obstinate in its course (Lahn); and it is said, also, that those cases which come on at night during sleep, are, in general, much more intractable than such as occur during the day, and are preceded by premonitory symptoms (Richter). It has been affirmed by men of great experience that epilepsy occasionally ceases sponta-

neously on a change of climate, or at the age of puberty where the disease has not been of protracted duration, (Lentin). Hereditary epilepsy, is perhaps always incurable. The morbid appearances on dissection, are often similar to those which occur in apoplexy and palsy. In many instances the cerebellum, exhibits stronger traces of structural disorder than the cerebrum, though this, as indeed the whole encephalon is usually found, highly engorged with blood. Wensel, whose dissections were very numerous, states, that in the majority of instances, he found the pineal gland, and parts immediately surrounding it, more frequently in a state of disease than any other part of the cerebrum. The cerebellum was in many cases, conspicuously diseased. It was sometimes preternaturally soft and of a dusky red color; but much more commonly, this portion of the brain was of a hard and compact consistence, with a peculiar yellowish friable matter lodged between the lobes. These dissections, however, refer to adult subjects, and it may be doubted, whether similar appearances would present themselves in children. Roederer, dissected many children who had died of this disease, and he affirms, that structural disorder of the cerebrum was a frequent occurrence. Esquirol, states that in his dissections at the Salpêtriere, he found in nine cases out of ten, the spinal marrow or its membranes in a distinctly diseased condition. The spinal marrow was generally much softer than natural, in different parts of its length; and the meninges almost uniformly presented unequivocal traces of previous inflammation. It must be confessed, however, that in some instances, the brain and its coverings, as well as the spinal marrow do not exhibit the slightest evidence of structural disease, though much engorgement of the blood-vessels occurs in nearly all cases.

Treatment.—The causes of epilepsy are so various, and in general so wholly beyond our cognizance, that we can seldom lay down any general and rational therapeutic principles for the guidance of our curative efforts. Medical treatment in this disease, is therefore often necessarily purely empirical. If we wish to make any effort against the progress of this distressing malady, we have, frequently, no other course left open to us, than to resort to those remedies which, according to the reports of eminent

physicians, or our own experience, have occasionally succeeded in removing the disease, without our being able, to give any other satisfactory reason for doing so. This, however, is not always the case. In some instances we have sufficient light in the symptoms and causes of the disease, to enable us to form a consistent and rational plan of treatment. When called to a case of epilepsy, therefore, the first object of the practitioner should be to inquire into the nature of the exciting cause, its duration, the time and manner of its attack, the constitutional habit of the patient, his age, previous or concomitant diseases, his habitual temper and disposition of mind, his manner of living, his probable hereditary predispositions, in short, into every thing which can throw light on the particular character of the disease. By well directed inquiries of this kind, we may sometimes find a clue, which will serve to guide us in the treatment to a fortunate result.

In cases preceded by *obvious* premonitory symptoms, we may sometimes prevent the accession of the paroxysm by the timely administration of some remedy capable of producing a sudden change in the excitement of the nervous system. When in children of robust and plethoric habits any feelings occur which may appear to indicate the approach of an epileptic paroxysm—more especially, when the child complains of giddiness, with the veins of the head turgid, and the carotids beating strongly, prompt and efficient *bleeding* will probably keep off the impending epileptic attack. When the premonitory stage is protracted, and connected with manifest signs of derangement of the bowels, *purgatives* are indicated and may occasionally postpone the approaching paroxysm. *Emetics* are, particularly recommended by Richter, for this purpose. They are most apt to prove serviceable, in keep.ng off the attack, he says, in those cases which continue to recur from the influence of habit, after the original exciting cause has been removed. He asserts that he succeeded in effecting an entire cure, in a case of this kind, by repeatedly suspending the paroxysm, by the administration of an active emetic a short time before the expected occurrence of the epileptic attack. Many eminent authorities, however, might be cited, against the use of emetics in this affection; and as a general rule

they are certainly to be regarded, as of very doubtful propriety. In cases attended with strong congestion in the vessels of the head, the operation of an emetic, would doubtless be attended with very considerable risk of injury. When the epileptic paroxysm is preceded, by the premonitory sensation termed *aura* in one of the extremities—that is, by a peculiar feeling of heat, as if a current of warm air were directed on the part, passing more or less rapidly from one of the inferior extremities to the head, the paroxysm may, sometimes be effectually prevented, by compressing the limb firmly, with a tourniquet or bandage, applied above the part, at which the aura may have reached. Dr. Cullen observes, that "a ligature upon the limb, above the part, from which the aura arises should always, in those cases be applied, both because the prevention of a fit breaks the habit of the disease, and because the frequent compression renders the nerves less fit to propagate the aura." An instance is related in the London Medical and Physical Journal, in which pressure in this way, prevented the occurrence of the paroxysm. (Cook.) Brechtedt and Michaelis, also, mention instances, of the successful employment of compression in cases preceded by the aura. It must be confessed, however, that cases attended with this remarkable premonitory symptom are extremely uncommon. In the course of my practice I have met with but two instances of this kind; and in both, the passage of the aura from the leg to the head was so rapid, and came on so unexpectedly, that there was not sufficient time given to resort to this means for preventing the accession of the fit.

The immediate danger, attending an epileptic paroxysm, depends almost entirely on the vascular turgescence in the brain; for when death takes place during the attack, it is almost invariably, in consequence of cerebral oppression, from excessive engorgement of the cephalic circulation—terminating in apoplexy. During the paroxysm, therefore, our principal object should be to diminish the preternatural congestion of the cerebral vessels, in order to protect the brain against fatal oppression or lesion. The importance of attending to this indication, is particularly great, in children of robust and plethoric habits, and where the signs of inordinate sanguineous congestion in the head,

are conspicuous. In instances of this kind, blood ought to be promptly and freely abstracted, sinapisms applied to the feet, and cold applications made to the head, while every thing which might compress the veins of the neck and impede the free return of blood from the brain to the heart, should be removed. Although no treatment during the paroxysms, can, I think materially mitigate its violence or shorten its duration, yet by these remedies we may at least protect the brain, and obviate a fatal termination.

It is during the intervals of the attacks, however, that our principal efforts must be made for preventing the recurrence of the paroxysms or effecting a permanent removal of the disease. I have already adverted to the importance of attending to the nature of the exciting cause, in instituting a course of treatment, for its radical cure. If our inquiries, in this respect are successful, it will aid us very materially, in the adoption of an appropriate plan of treatment. Thus, if on a careful examination, it be found that the bowels are in a loaded and irritated state, and particularly, if manifestations of intestinal disorder existed previous to the occurrence of the disease, it will, undoubtedly be very proper to attend to the state of the alimentary canal, as an important preparatory measure in the treatment. In children, epilepsy is frequently originated by gastro-intestinal irritation; and in many cases arising from other causes, the disease is aggravated and sustained by a deranged state of the alimentary canal. In cases of this kind *emetics*, according to the experience of many eminent physicians, have occasionally produced the happiest effects. Richter declares, that in some instances of this disease attended with nausea, flatulency, acidity, colic pains, and other manifestations of indigestion and gastro-intestinal irritation, he has resorted to a course of emetics with entire success. In a child about five years old, which had been affected with epileptic paroxysms, twice and sometimes three times a month, for upwards of a year and a half, I succeeded in arresting the progress of the disease entirely by a course of emetics. An efficient dose of ipecacuanna in union with a few grains of calomel, was administered every third day, and continued for nearly six weeks. This case came on, after a severe attack of ague, which was speedily cured with Fowler's

arsenical solution. When the disease is attended with a prevailing disposition to generate acid in the primæ viæ, as is frequently the case in infants, alkaline remedies, in conjunction with mild tonics, and an occasional laxative, are sometimes decidedly beneficial. The famous powder of Margrave, which was formerly so much employed, by the Germans, in infantile epilepsy owes, whatever power it possesses to its antacid, tonic and aperient virtues. It is composed of one ounce of powdered mistletoe, the same quantity of white sugar, and half an ounce of the carbonate of magnesia. The dose is a teaspoonful, two or three times a day, for a child under five years old. When vomiting occurs at the end of the paroxysm, we may presume, says Richter, that, the primary cause of the disease is located in the stomach; he mentions, also, a peculiar tremulous motion of the under lip, as a sign of gastric irritation, from vitiated secretions or other offensive matters. Van Swicten, states, that in a case of epilepsy, in a child, in which the paroxysms were invariably preceded by this tremulous motion of the *under* lip, he employed emetics and purgatives with entire success. It need scarcely be observed, that in cases attended with worms in the bowels anthelmintic remedies should be employed. More than twenty years ago, I saw a child, which for upwards of six months, had one, and sometimes two, well marked epileptic paroxysms every week, attended with paralysis of the left arm, and which was, finally entirely relieved of the convulsive affection, by the expulsion of an enormous mass of lumbrici, in consequence of the use of a strong decoction of spigelia. In general small doses of calomel, with an occasional active dose of castor oil and turpentine, will answer better in such cases than any other remedies we possess. The German physicians are much in favor of the employment of full doses of powdered valerian root, in epilepsies depending on verminous irritation. I have known the paroxysm to be suspended for many months by the use of this article in union with the oxyde of zinc; and from cases published in late European medical journals it would appear that valerian in conjunction with the elutriated oxyde of tin, has been used with complete success. From ten to twenty grains of the former, with

from three to six grains of the latter article, may be given three times daily, to children of from two to seven years old.

In cases that come on soon after the sudden drying up of some long standing eruption about the head, or discharging sores behind the ears, the manifest indication is to restore the local affection, or to substitute in their stead others, artificially. Issues, setons, blisters, and frictions with tartar emetic ointment, may be advantageously resorted to for this purpose. Diaphoretics, purgatives, warm-bathing and stimulating frictions, are also appropriate remedies in such cases. Prichard recommends mercury to the extent of producing ptyalism in cases arising from this cause; and Richter states, that he has found musk and camphor, peculiarly beneficial in this variety of this disease.

Epilepsy from local injuries of the head, has been cured by surgical operation. Successful instances of trepanning in cases of this kind are related by Boerhaave, Thenier, Stalpart, Van der Weil, and Tissot. Dr. Massie,* has given an account of a case of epilepsy which was produced by a blow on the head, and consequent depression of a portion of the cranial bones. After the disease had continued for nearly four years the patient was trepanned, and a spicula of the depressed bone removed after which the paroxysm did not return. Dr. Dudley of Lexington, also succeeded in curing a case of Epilepsy, by removing a spicula of bone, which had penetrated the substance of the brain; and Dr. Rogers of New-York succeeded in a similar case by such an operation. Dr. Guild, of Alabama, has given an extremely interesting account of a case of epilepsy, which deserves to be consulted as a remarkable instance of successful trephining in this disease.†

In very many cases, however, the most careful inquiries lead us to no satisfactory information, as to the primary or exciting cause of the disease; and in the majority of cases, the causes are of such a character as to be wholly beyond our control; or the original cause may have disappeared, and the disease be continued by the influence of habit, in co-operation with an acquired or hereditary predisposition. Under such circumstances, we

* Philadel. Med. and Physical Journal. 1829. No. 35.

† American Journal of Medical Science. October, 1829.

have no resourses left us, but those which are founded on bare experience—and we are obliged if we wish to make any remedial effort, to resort to some one, or many by turns, of that long list of remedies, which, according to the testimony of eminent practitioners or our own observations, have been known occasionally to effect a cure. These remedies are, generally, much decried in the books, as *empirical*. It is, nevertheless, certain, that many of them, have, at times, cured, even inveterate cases, and when all lights to a more rational course of treatment fail, it can neither be wise nor proper to reject these "empirical" resources. The truth is, that in cases that are unconnected with organic disease and continued merely by the force of an established predisposition and habit, any thing which is capable of producing a permanent change in the excitability and excitement of the brain and nerves, may under favorable circumstances, suspend, or wholly arrest the recurrence of the paroxysms. The following are the most celebrated of these anti-epileptic remedies:

Valerian was formerly much employed in this disease. Quarin asserts, that he has more frequently found it beneficial in the epilepsies of infants than any other medicine. It is said to be most useful in cases depending on verminous irritation. It should be given in large doses. Biett, who speaks in the most favorable terms of its powers in this disease, recommends the oil. From five to ten drops of the oil of valerian may be given to a child of from two to seven years old, three or four times daily. I have in several instances postponed the paroxysms for two and three months by the use of this remedy. The *animal oil of Dipple*, has also been much commended as a remedy in this disease. Hoffman, Cullen, Bang, Kortrum, Quarin, Werlhof and Richter, mention cases that yielded to its powers. The latter writer found it most useful in epilepsies arising from repelled cutaneous eruptions. The dose for a child between two and ten years old is from five to ten drops. Of late years, the *spirits of turpentine*, has been strongly recommended in certain varieties of epilepsy in adults. Biett has employed it in infantile epilepsy with complete success. It is particularly adapted to cases depending on intestinal irritation. The *oxyde of zinc*, is generally regarded as one of our most valuable remedies in epilepsy: and from the testimony

extant in relation to its powers, as well as from facts that have come under my own notice, I am inclined to regard it as a medicine of considerable powers in this affection. I used this article in the case of a child, about four years ago, with unquestionable advantage. The fit which recurred twice and sometimes three times a month, was suspended by the use of this medicine for upwards of four months, and it never after returned more than once a month. This medicine ought to be given in as large doses as the stomach will bear. A child two years old may begin with a quarter of a grain, and gradually increased to a half or even a whole grain, and the dose should be repeated thrice daily. The *sulphate of zinc* also, has been successfully employed in this affection. Weikert mentions several cases in children, which yielded to this remedy. Lettoom, Cullen, Ideler and others, speak in favorable terms of its powers. This, and the preceding article, appear to be most apt to do good, in cases, recurring from habit, and where the original exciting cause is no longer present. The *cuprum ammoniacum*, was a favorite remedy with Cullen, in the treatment of this affection. I have used it very frequently, in the epilepsies of children; but generally with but little or no obvious advantage, excepting one instance in which it effected an entire cure. It should never be given in cases attended with a morbidly irritable, or irritated state of the alimentary canal. Richter asserts, that it is only calculated to do good in torpid, inirritable and phlegmatic habits, connected with a healthy condition of the digestive functions. According to the experience of Haase an eminent German writer, this article is much better adapted to the cure of epilepsy in adults, than in children; and he accords with Richter in regarding inirritable and phlegmatic subjects, as most apt to derive benefit from its use. The dose to a child between two and ten years, is from the 20th to 8th of a grain three times daily, and gradually increased until it creates nausea. No remedy has of late years been more frequently employed, in epileptic affections, than the *nitrate of silver;* and from the various and highly respectable testimonies we have in relation to its powers, it is without doubt, entitled to considerable attention as a remedy in this disease. To derive any decided advantage from its use, it ought to be given in as large doses as the

stomach will bear. Small or inefficient doses very rarely, if ever, make any obvious impressions on the disease. When given in the form of pills, it may in general be administered in much larger doses without unpleasant effects on the alimentary canal, than when exhibited in solution. It may be advantageously given in union with the extract of cicuta, or of hyoscyamus. Richter states that this article seldom does any good unless the digestive organs are in a healthy and active condition; and Dr. Harrison considers it as particularly adapted to those cases which are connected with a morbid irritability of the nervous system. Out of a considerable number of cases, in which I have employed this remedy, one only was permanently relieved under its use. This case was in a child, about seven years old, and was occasioned by sudden and violent terror. When recourse is had to this remedy, its use ought to be continued, without interruption, for several months; for it will sometimes manifest no beneficial effects for many months, yet finally arrest the progress of the disease. It is a common practice to discontinue the use of this and other similar remedies, if no obvious advantage is derived from it, in the course of five or six weeks. This I am persuaded, is sometimes the cause of failure in our attempts to subdue this malady. I once succeeded in curing a case of seven years standing by persisting with the use of the same remedy for nine months.

Tin, also, has been strongly recommended as a remedy in this affection. Dr. Shearman asserts, that the elutriated oxyde of tin has more frequently succeeded in his hands, than any other remedy he has ever employed. To children, it may be given in doses of from three to ten grains, three or four times daily, It is said to be particularly useful in cases connected with verminous irritation. I have employed this article in combination with powdered valerian root, in one instance with the effect of postponing the paroxysm for five or six weeks beyond the usual time of its recurrence. In adults I have known the *sugar of lead* to be used with entire success; and many authorities of great respectability might be cited, in favor of its employment in this affection. Dr. Rush cured two cases with this remedy, and Drs. Spence and Agnew, declare that they have used it with great

advantage in some cases. A great variety of other remedies have been employed with occasional benefit, and are recommended by different writers, as worthy of attention in this intractable malady. Some of the narcotics, particularly *opium*, *camphor*, *belladonna* and *stramonium*, have occasionally done some good. Very generally, however, no advantage whatever, can be obtained from remedies of this kind; and they are often decidedly injurious, by increasing the flow of blood to the head. The root of the *pæony* was formerly much esteemed for its sanative powers in this complaint. Hufeland, speaks of it in very favorable terms. He asserts that in the epileptic affections of children, it is one of our most valuable remedies. From three to ten grains of the dried root, according to the age of the child, may be given three times daily; or an infusion of an ounce of the root to a pint of water, may be given in doses of one or two teaspoonfuls, every three or four hours. Upwards of twenty years ago, I was acquainted with an empiric, who used this article in epilepsy, and I know that he effected an entire cure in several cases, one of which had previously been under my own care. The following mixture has been used with complete success in some instances of this disease, and frequently with the effect of postponing the paroxysm for many months. Dr. Otto of Philadelphia, assured me that he has, repeatedly employed it with very decided advantage.*

Mercury, carried to the extent of producing salivation, has been known to cure this disease. It is said to be most apt to prove serviceable in cases depending on suppressed discharges or repelled chronic cutaneous eruptions. Bang, Willes, I. Frank, Tissot, and others mention cases in which this remedy was successfully used.

Various *external* means have also been employed, and occasionally with decided benefit, in the treatment of this complaint. *Galvanism*, has been employed, and in a few instances with great advantage. According to the experience of Mansford,

* ℞ Pulv. Zingiberis.
Pulv. fol. Solivæ.
Pulv. sem. sinapi aa ℥ss.
Dose a tea spoonful, three times daily, for a child five years old.

little or no benefit is to be derived from galvanism in this disease unless it be applied steadily and uninteruptedly, and only with a weak force. The negative pole, he says, should be applied as near the brain as possible, and the positive one on some distant part of the body. Setons, and issues may be useful in certain cases, connected with a prevailing tendency to inordinate determinations of blood to the head, or arising from suppressed discharges or repelled eruptions. Pustulation with tartar emetic ointment, was used by Mr. Crighton, in six cases with very obvious benefit, though not with entire success. The ointment was rubbed in along the whole tract of the spine. More recently Dr. Carter has employed this remedy in five cases of epilepsy, with unequivocal advantage. Besides the foregoing remedies, a great many others have been employed and recommended in this affection: such as artemisia vulgaris (Burdock;) *veraeium album*, (Stark Greding,) *mistletoe* (Boerhaave, De Haen, Hufeland;) the root of *white lilly* (Hufeland;) *philandrium aquaticum; radix mea* (jahn) *sedum acre* (Zachorn;) fol aurantiorum (Van Sweiten, De Haen, Stoerk; the *carbonate of potash* in large doses. (Hufeland's Journal.)

CHAPTER XLI.

CARPO-PEDAL SPASMS.

This affection was, I believe, first distinctly noticed by Dr. John Clark of Dublin, in his Commentaries. About sixteen years ago, an interesting paper was published by Dr. Kellie on this subject;* and at a subsequent period, Dr. James Johnson published some observations on the disease, of a very interesting character.† The most satisfactory account of this remarkable form of convulsive disease, that has as yet been given to the public, is to be found in the treatise of Dr. North. Dr. James Johnson denominated this affection *carpo-pedal spasm;* others have designated it as a form of *cerebral spasmodic croup;* and Dr. North has treated of it under the head:—*A spasmodic affection of the chest and larynx in young children, accompanied by general or partial convulsions.* The following are the phenomena and general course of this affection, as detailed by Dr. North, and in the interesting paper on this subject published by Dr. Kellie.

The disease generally occurs between the third and seventh month of age. It usually makes its approaches in a very gradual manner. At first, the symptoms are often so slight, as scarcely to attract the attention of the persons about the infant. Among the earliest symptoms of the approach of the disease is a very peculiar hurried breathing, accompanied "by that kind of noise which an increased secretion of mucus in the air passages would produce," occurring at the moment the child wakes from sleep. Frequently the child awakens, as in a fright, and is immediately af-

* Edinburgh Med. Journal, Vol. 12.

† Med. Chir. Journal, Vol. 3, 1817.

fected with this agitated respiration, and rattling in the trachea. "If the little patient has previously enjoyed a good state of health, the characteristic rotundity of feature observable in infants, quickly undergoes a remarkable change; the countenance becomes anxious, the sides of the nose are drawn in, the face is pallid and emaciated, the child frowns almost constantly, and *when put to the breast, it sucks greedily for a moment, but suddenly ceases to do so, throwing back the head with violence.*" The bowels always become constipated in the progress of the disease. These symptoms may recur, with more or less frequency, for a very considerable time, before any remarkable change takes place, indicative of a further development of the affection. "A convulsive motion of the hand is usually the next morbid sign which excites attention. The child's thumbs will be found constantly and firmly pressed upon the palm of the hand; the wrists and ankle-joints are bent rigidly inwards; the head is often thrown backwards, by which the anterior muscles of the neck are kept painfully upon the stretch. The inconvenience at the moment of waking is not now a mere acceleration of breathing. This symptom still continues in an aggravated degree—but the noise accompanying the respiration has gradually assumed a very different character from that which at first marked it. Each inspiration is now attended by *a loud crouping noise*, which may be heard in an adjoining apartment; the chest and larynx appear to be painfully constricted; the heart palpitates violently; the child sobs, but never cries in its natural manner, during these paroxysms of suffering. So great is the difficulty of breathing, that it sometimes appears to be almost totally suspended for a few seconds. The countenance is then pale, as in syncope. Sometimes, though rarely, the face is dark, and the vessels of the head and neck turgid, as in apoplexy. As the disease advances, the little patient experiences more or less frequent attacks of general convulsions, during which the features are much distorted; and the whole body is occasionally implicated in the convulsive movements. In a child, in whom the convulsions were very frequent and severe, the state of opisthotonos was

so complete, that for many days the head and heels were the only parts which touched the bed; and if, with difficulty, this apparently painful position was altered by the mother, it was quickly resumed. In the majority of cases, no sustained febrile action is to be detected, nor is there usually any indication of particular determination of blood to the head."* Sometimes, the locked state of the thumbs, rigidly bent position of the hand and foot, and stridulous or croupy respiration, will continue several weeks with scarcely any intermission, though irregular intervals of remission and exacerbation are always more or less conspicuously noticed. "The child sometimes appears lively for a short period, and the countenance may be animated by a momentary gleam of cheerfulness; but it almost invariably awakens from its slumbers, however tranquil they may sometimes appear, with a convulsive paroxysm similar to that described above." After the termination of a paroxysm, the child appears to be greatly exhausted, and with scarcely the power of voluntary motion for some time. Dr. Kellie's description of this affection is somewhat different from the one just given from Dr. North's work; but in the main and characteristic phenomena, they coincide sufficiently to enable any one to refer it to one and the same form of infantile disease. "On the anconal aspect of the metacarpus of the hand," says Dr. Kellie, "and on the rotular aspect of the metatarsus of the foot, a remarkable tumor occurs, having a considerable degree of roundness and elevation, resembling that sort of swelling which might arise on the same parts from a blow or contusion. It seems to arise suddenly, and when first observed, it has somewhat of a mottled, livid and purplish color, resembling the chilled hand of a full and healthy child after exposure to a cold and frosty atmosphere. It has no inflammatory heat, and does not appear to be morbidly sensible, or to give any pain to the child when handled; nor does it pit on pressure, but rather gives the sensation of firmness and resistance. When an attempt is

*North. loc. citat. p. 259.

made to move it sideways, under the skin, it conveys the notion of a disease peculiar to infants, known by the name of *skin-bound*. These tumors terminate abruptly at the carpus and tarsus, so that in lusty children it seems in these places, as if confined by a cord or bandage. They sometimes continue for two or three weeks; occasionally, they disappear in a few days; and in other instances, they disappear and re-appear at short intervals. The tumor sometimes becomes leucophlegmatic, loose, with considerable œdema spreading upwards on the legs. This however never occurs unless the swelling continues for several weeks without abatement; but its more sudden disappearance without undergoing these changes, or without passing into a state of leucophlegmasia, is by far more common. This swelling on the tops of the hands and feet is connected in a great proportion of cases with *a spastic contraction of the flexor muscles* of the thumbs in the upper, and the toes in the lower extremities. The thumb becomes rigidly contracted, and permanently bent downwards and laid flat upon the palm of the hand; and in like manner, the toes are bent down to the plantar aspect of the foot. Along with the thumb, the carpus is also in some cases drawn inwards by a spastic contraction of its flexors."*

In Dr. James Johnson's case,† the child, (nineteen months old) was seized three or four times in the hour, "with spasmodic affections of the respiratory muscles, consisting of repeated attempts to fill the chest, during which, she threw herself back, as in opisthotonos, and appeared as though she would be suffocated. These fits would last ten or twelve minutes, after which the child was somewhat easier, but always fretful and peevish. The backs of the hands and insteps were swollen and hard; the thumbs rigidly contracted, and locked across the palms of the hands; the toes were bent down towards the soles of the feet; and both wrists and ankles were firmly bent by the contraction of the flexor muscles. The bowels were torpid; the stools clayed or

* Dr. Kellie. loc. citat.

† Med. Chir. Jour. May 1817. pp. 448, 449.

slimy, and offensive; and the child was extremely irritable, both by day and by night." During the preceding summer, I met with an instance of this affection, in a child about nine months old, in other respects of a remarkably vigorous and robust state of health. The symptoms of this case coincided so closely with those mentioned in Dr. Johnson's case, that his description applies in every point to its phenomena and course.

It does not appear that this singular affection is attended with much danger, when timely aid is afforded with proper remedial means. Dr. North had seen but one fatal instance of this malady; and Dr. Johnson states, that in his own practice no instance of death has occurred from it. The case which came under my own observation, terminated favorably, after the process of primary dentition was completed. It should nevertheless be regarded as a disease of an unfavorable tendency; for it cannot be doubted that the cerebral irritation which gives rise to its characteristic phenomena, may, under certain states of predisposition, and in co-operation with other causes, tending to encephalic disease, readily pass into a state of vascular irritation, or sub-inflammatory action in the brain or its meninges; and thus ultimately give rise to fatal effusion, or lesion in the brain, or its spinal prolongation.

In the only dissection which is reported by Dr. North, the traces of cerebral disorder were sufficiently conspicuous. The vessels of the brain were very turgid; a small portion of blood was effused under the dura mater in several parts; a small quantity of serum was found in the ventricles; and the whole mass of the cerebrum was unusually firm, while the cerebellum was softer than common. The thorax was not examined. Dr. North ascribes the inordinate determination to the head, and the evidences of encephalic disorder, presented on dissection, in this case, to an accidental and overwhelming "rush of blood to the head, caused by a very passionate fit of crying," just before the occurrence of the last and fatal paroxysm. He thinks the characteristic phenomena of the disease are entirely independent of *cerebral*

derangement, and that "in the majority of cases, there is no evidence of affection of the brain," and that we have no right to assume that certain individual symptoms—such as the crouping noise or bent thumb, must *necessarily* be followed by affections of the brain.

From a general view of the phenomena of the malady, it appears to me, nevertheless, highly probable, that the disease is *ab initio* and essentially connected with nervous irritation of the sensorium, propagated at last in very violent cases to the spinal cord. The frowning aspect of the countenance—the starting from sleep—the peevish and fretful temper—the occasional flushing of one cheek mentioned by Kellie, the costiveness and hepatic torpor, &c., all seem to indicate a state of nervous irritation or erethism of the brain; and the opisthotonic spasms, which are wont to supervene in aggravated cases, point very directly to irritation of the spinal cord.

Whatever may be thought, as to the proximate cause of this affection, all writers on this subject agree in ascribing its origin to dental irritation. It seems to be much more apt to occur in children of a robust and full habit of body, than in such as are of an opposite constitution. So far as I have been able to ascertain, the disease has never been observed to occur except during the actual progress of primary detention; and where it does not terminate fatally, at an earlier period, it always subsides soon after the completion of this process.

Treatment. This affection, as has already been observed, is almost always intimately connected with difficult and powerful dentition. In all instances the gums should be promptly examined, and if they exhibit a swollen or expanded appearance, they should be, at once, freely divided down to the advancing tooth. "I have known" says Mr. North, "the croaking respiration and spasms of the hand and feet instantly subside upon freely lancing the gums." Care should be taken, in performing this operation, that the gum be perfectly divided down to the tooth, for unless the firm membrane which is

spread over the crown of the advancing tooth, be completely divided, little or no benefit can result from the operation. A simple incision will be sufficient for the incisors and canines, but "we should always make a crucial incision, when it is our object to liberate the molares."

Purgatives are, in general, indispensable in this affection. In nearly all instances, the bowels are either constipated, or disordered in such a way, as to require the use of purgatives. The milder articles of this kind are "rarely if ever to be depended on." It is necessary to procure active purgation; and for this purpose, calomel and jalap, or calomel succeeded by infusion of senna and manna, are in general to be preferred. In many instances the alvine evacuations are of a whitish or clay color, manifesting a deficiency of the biliary secretion. In such cases small doses of calomel in union with ipecacuanha will be very useful. They should be given three or four times daily, with an occasional dose of castor oil, or senna infusion, until the stools become conspicuously mixed with bile. In robust and plethoric infants, it will, often, be highly useful to abstract blood, either from a vein with the lancet, or by leeching from the head. Where the determination of blood to the brain is very strong, North advises opening a jugular vein, or cupping upon the temples. I have, in a few instances, derived great benefit from the application of blisters behind the ears, or on the back of the neck. They cannot, however, be used, with propriety, where the pulse is active, or where depletion is indicated. In cases attended with a small and frequent pulse, and great irritability of the system, small doses of Dover's powder, or of the extract of hyoscyamus, will generally procure very considerable relief. Great care, however, is necessary in the employment of narcotics in this affection. Where the face is often flushed, and the pulse tense or corded, or where the habit is manifestly febrile, they can seldom be used without considerable risk of injury. It is only after the gums have been lanced—the bowels freely purged, and the patient is free from febrile irritation, with more of nervous than vascular irritation, that remedies of this kind can be used with a prospect of benefit; and under circumstances of this kind they often

operate beneficially. Mr. North states, that in some cases "where the convulsive breathing and violent action of the diaphragm were very great, frictions upon the chest with a liniment composed of laudanum, spirits of camphor, and soap liniment, three or four times a day has afforded much relief." I have used frictions along the spine, with a mixture of two parts of laudanum and one of the essential oil of amber, with great benefit, in this complaint. The frictions should be repeated three or four times daily. Rubefacient applications, also, along the spinal region, may afford some relief; and it is not impropable that cupping over the spine would prove advantageous. In the early stages of the disease, the warm pediluvium, repeated two or three times daily, is capable of affording very considerable benefit. In a case I attended some time ago, the child was invariably much relieved by placing its inferior extremities in warm water. The bath was repeated every three or four hours, under the employment of which. in conjunction with the use of purgatives, blisters behind the ears, and lancing the gums, the disease gradually subsided, and the infant is now perfectly healthy.

Cold applications to the head, while the feet are placed in warm water, seldom fail, promptly to mitigate the paroxysms of spasmodic respiration. No advantage can be derived during these paroxysms, from stimulating anti-spasmodics, such as asafœtida, ether, camphor, &c. Indeed, articles of this kind, at any period of the disease, are generally decidedly injurious.

If the child has been weaned, nothing but the blandest and simplest nourishment must be allowed. All stimulating articles of diet and drink must be carefully avoided. If the weather is fine, exercise, by gestation in the open air, will contribute to moderate themorbid irritability of the system.

CHAPTER XLII.

CHRONIC ERUPTIVE AFFECTIONS.

Crustea Lactea

THIS very disagreeable eruptive disease, is, I believe, altogether confined to infancy, and is evidently intimately associated with dentition, since it very rarely occurs either before the commencement of this process, or after it is entirely completed. The appearance of this eruption varies considerably, according to the degree of inflammation, and the greater or less thickness of the scabs. In some instances a number of small pustules are scattered over the scalp, forehead, temples, and cheeks, which in a few days break and form thin and moist crusts. This mild form of the disease is almost entirely confined to very young infants. In the majority of cases, the eruption commences on the cheeks or near the centre of the forehead, in the form of small whitish pustules, grouped in clusters on an irritated and bright red surface. These soon break, and a viscous, yellow fluid is effused, which concretes into thin, soft crusts of a yellowish green colour. These crusts gradually increase in thickness and extent, and a thin viscid fluid oozes from beneath them of an offensive and acrid character. Very frequently the whole face, with the exception of the nose and eye-lids, are covered with an almost continuous crust, the child appearing as if it had a mask on its face. When the first scabs fall off, the surface which they expose appears highly inflamed, with a vast number of minute excoriations, from which a sero purulent fluid issues, which soon concretes into a fresh crust. Sometimes large pustules come out behind the ears, around the mouth, and on the chin, which speedily give rise to a thick greenish yellow crust on those parts. "Under some circumstances, the mouth is surrounded with large, thick, yellow incrustations, which are of a deep brown in certain spots, where a little blood has mixed with the dried fluid; in these movements the lips are much

impeded: at other times these thick incrustations occur behind the ears." (Cazenave.) This eruption occurs not only on the scalp, forehead, and face, but occasionally extends also to the body and limbs. Dr. Dewees states that he has seen it "cover nearly every part of the cuticular system;" and I have met with several instances, where the eruption extended itself to the body and extremities. In some cases the disease is confined to the cheeks—in others the forehead and temples are the only parts affected; and occasionally it is seated exclusively on the hairy scalp.

There is always much itching in the parts affected; and in some instances the itching and pain are so severe and constant, as to wear down the infant, and bring on a slow irritative fever, attended with much exhaustion and emaciation.

When the disease is about disappearing, the discharge from the sores diminishes; "the crusts are formed more clearly and become thinner and whiter, the surface upon which they rest becomes less and less red; they are soon replaced by a slight desquamation, which also speedily disappears, and there only remains a light rosy tint on the spots that were the seat of the disease, and this also gradually fades away." This eruption never leaves any permanent marks or cicatrices—the skin of the affected parts acquiring its natural smoothness and color, in the course of five or six weeks after the eruption has disappeared.

The duration of this disease, is extremely variable. In some instances it disappears spontaneously in the course of four or five weeks; more frequently, however, it continues for three or four months, and often much longer. I have known several instances to continue for upwards of a year.

Crustea Lactea is not a contagious affection. Children of robust and full habits, appear to be more liable to it, than those who are in a feeble and sickly condition. Nothing, satisfactory has been ascertained, in relation to the causes of the disease. It is evident, however, that the irritation of dentition is in some way or other, intimately connected with the eruption. The constant preternatural determination of blood to the head, which is apt to take place during dentition, is propably a principal cause of the disease.

In the majority of instances, the general health remains good, during the continuance of the eruption. Occasionally the irritation and itching are so great and incessant, that the child sinks at last into a slow and wasting irritative fever. Sometimes a considerable degree of gastro-intestinal irritation supervenes, causing diarrhœa, emaciation, and exhaustion. The disease, however, is probably never fatal except when it becomes complicated with disease of some important viscera or with rapid and profuse diarrhœa. Dr. Dewees, has seen two instances of death, from this disease. In these cases, the eruption "covered nearly the whole of the body," and the children "were destroyed by the pertinacity of the fever and the profuseness of the diarrhœa." In general, however, the prognosis in this affection is quite favorable. Indeed, many infants appear to be healthier during this complaint than they were previous to its occurrence; and it seems, often, to counteract the supervention of other diseases—particularly cholera infantum, hydrocephalus and convulsions.

Contrary opinions have been expressed with regard to the propriety of remedial applications in this diagreeable affection. It is contended by some, that the eruption is the result of a salutary effort of nature, and that it can seldom be removed by artificial means, without much risk of bringing on other and vastly more dangerous affections. Others say, we may with perfect safety, in all instances, remove the disease; and that it should never be suffered to continue if we possess means capable of arresting its progress. That great and irremediable injury may result from the sudden removal of this eruption, by artificial means I have not the slightest doubt. I am confident that I have seen indomitable diarrhœa, hydrocephalus, and general emaciation and febrile irritation, brought on, by a rash and successful interference with this disease. Within the present year I witnessed two instances of the pernicious consequences of suddenly drying up the eruption. Both infants were remarkably healthy, although the forehead and cheeks were covered with a thick porriginous crust. The mothers were unwilling to permit their infants to remain in this unpleasant condition; and although earnestly cautioned against the use of the remedies they proposed, they pursued their own views, and in a short time effected a complete removal of the

eruption. In six weeks afterwards, one of these children died of hydrocephalus, and the other was extremely wasted by diarrhœa and finally died from intestinal irritation and exhaustion. It cannot be questioned, indeed, that in many instances the disease may be removed by remedial applications, without the slightest ill consequences; and when the cure is effected in a gradual manner, in conjunction with proper precautionary measures, it will very rarely lead to any unfavorable results. It is against the external application of *active* remedies—remedies capable of causing a rapid desiccation and disappearance of the eruption, without suitable preparatory measures, that I would particularly object.

Treatment.—I have generally commenced the treatment with the use of small doses of calomel, in union with the golden sulphur of antimony, with an occasional laxative dose of sulphur and magnesia. A quarter of a grain of calomel, with the same quantity of golden sulphur of antimony, given three or four times daily. If this does not keep the bowels in a sufficiently loose condition, a moderate dose of lac sulphuris and magnesia (ten grains of each,) should be given, from time to time, so as to procure, at least three loose evacuations every twenty-four hours. The affected parts should be frequently fomented with tepid milk and water, or with a decoction of bran. By the employment of these remedies we may in general, moderate the irritation and itching of the affected parts very considerably, in the course of ten or twelve days. When an obvious impression is made on the disease in this way, the calomel should be less frequently administered, and the mixture of sulphur and magnesia employed daily, or every other day, so as to keep up a loose state of the bowels. Having employed these remedies for two or three weeks, we may next resort to local applications; and for this purpose, fresh citrin ointment, weakened by the addition of an equal portion of lard, has more frequently answered my intentions than any other remedy of this kind I have tried. Dr. Dewees recommends the use of calomel ointment, prepared according to the following formula.* The tar ointment also, has been much employed for this

℞. Calom. ppt. ʒii; Cerat. Simp. ℥i; Ess. lemon gtt. xx. M.

purpose; and I have frequently used it with much advantage. Whatever application of this kind be resorted to, it ought not at once, to be applied to the whole or even an extensive portion of the porrigenous surface. A small portion, only, of the diseased part should, in the first place, be touched with the ointment. "When this becomes relieved, a second spot must be selected for its application, and so on until the whole of the diseased surface has been passed over and relieved."

The French physicians, are much in the habit of employing sulphurs, alkaline lotions, in this affection, and they are undoubtedly often very effectual. A wash made by dissolving a drachm of sulphuret of potash, and two drachms of the sub-carbonate of soda in a pint of warm water, is recommended for this purpose by Cazenene. I have used this lotion in a few instances with entire satisfaction. When the disease appears on the body and limbs, this writer advises the use of "sulphurous, alternated with tepid emollient baths."

Where there is much inflammation, and the child is of a robust and plethoric habit, considerable benefit may be derived from blood-letting, or from the application of leeches behind the ears. When the disease attacks the scalp, the hair should be cut very short, and emollient cataplasms applied over the affected parts, until the crust separates. The tar or reduced citrin ointment should then be applied, not over the whole surface at once, but in the successive manner that has just been mentioned.

When the irritation and itching are very great I have frequently known great relief obtained from the application of fresh cream to the affected parts. It will also tend much to the comfort of the child, if the acrid secretions are frequently washed off, with tepid milk and water, or a weak solution of fine soap.

Formerly the *viola tricolar* (hearts case) was much employed as an internal remedy in this affection. About eighteen years ago, I employed this article in a very severe and obstinate case, and as it appeared to me with considerable advantage. The expressed juice of the fresh plant is given in doses varying from one to two drachms; or a decoction of the dried levaes in milk, in the proportion of an ounce of the leaves

to a half pint of milk may be used. This quantity must be taken during the day.

The diet of the child must be carefully attended to. If the infant is still nourished at the breast, much benefit may sometimes be obtained by changing the milk. Where this is impracticable, it should not be permitted to suck more than two or three times in the course of twenty-four hours, whilst the deficiency of nourishment from the breast, is made up by feeding it on thin water gruel, cows' milk and water, thin arrow root, or barely water. The nurse too, ought to avoid eating salted meats, and in severe cases, should be confined almost entirely to a milk and vegetable diet. All spiritous drinks, such as wine, brandy and water, ale, beer, &c. should rigidly be avoided, on the part of the nurse. Children who are weaned, should be nourished on milk and water, arrow root, sago, oatmeal gruel, &c. Every kind of stimulating food and drink must be forbidden. Exercise in the open air, by gestation, will be useful; and the head must be kept wholly uncovered.

2. *Sore Ears. Excoriations behind the ears.*

This is a very common affection with robust and plethoric infants during dentition. It begins in the form of small pustules, which soon ulcerate; or instead of pustules, the skin becomes inflamed, and in a short time, terminates in superficial ulceration or excoriation, from which an offensive serous fluid issues. When these sores are neglected or mismanaged, they are apt to degenerate into very painful and severe ulcers, which are, in general, extremely difficult to bring to a mild and healing condition. In this aggravated state, there is almost always a very copious discharge of offensive, purulent matter, which in many instances becomes so acrid as to inflame and excoriate the parts over which it flows. The whole external ear, sometimes becomes much inflamed and swollen, and a deep ulcerous fissure is formed in the groove behind the ear.

Dr. Dewees asserts that the apprehension of dangerous consequences from drying up these sores, "is a popular prejudice, perpetuating an evil which should never have been permitted to have existed." I am not of this opinion. I conceive, and I

think on very good grounds, that irreparable injury may result from the sudden drying up or healing of these sores, particularly during the active progress of dentition. The Doctor has been more fortunate than I have been, if he has never known any serious evils to result from this cause. I doubt whether any prudent physician would advise the application of drying remedies to excoriations of this kind, while the infant was under the iufluence of painful dentition. That these sores may be improved and gradually healed by a cautious and judicious course of management, without any unpleasant consequences, I freely admit. I have never suffered this affection to continue without making efforts to moderate its severity and to bring it by degrees, to a healing condition. The positive declaration, however, that the notion that such sores are not to be hastily dried up, is a vulgar or "popular prejudice," is certainly not warranted by the experience of many of the most eminent practitioners that have expressed their opinions on this subject.

In the majority of instances, more or less torpor of the bowels is connected with the appearance of these sores. Whether this be the case or not, however, purgatives are always indispensable in the management of the complaint, not only with the view of moderating the inflammation and promoting the cure of the sores, but as means calculated to obviate the unfavorable effects that might arise from the drying up or healing of the disease. Very active purging, however, is neither necessary nor proper, at least not after the bowels have in the first place, been freely evacuated. It will be sufficient to procure three or four free evacuations in the course of a day. For this purpose, I have generally administered a grain of calomel in the evening, with a small dose of magnesia and sulphur, or of castor oil on the following morning. If the gums are inflamed or swollen, from dentition, they should be divided by a free incision down to the advancing teeth. The use of warm pediluvium, may also be beneficial by its tendency to counteract the preternatural determination of blood to the head, which usually attends such cases. The sores should be kept as clean as possible, by washing them repeatedly with tepid milk and water, or warm water with a small portion of fine soap dissolved in it. This is of much

importance; for if the acrid and offensive discharge is suffered to remain, and spread itself over the surrounding parts, it never fails to increase the pain and inflammation, and enlarge the extent of the ulcer or excoriation. It is indeed always extremely difficult, if not impossible, to improve the condition of the sore, whatever means may be employed, unless the strictest attention be paid to keeping the affected parts clean. In cases attended with severe ulceration and inflammation, much relief may be obtained from the application of soft emolient poultices, renewed every four or five hours, until the pain and inflammation are moderated. Fomentations with a decoction of white poppy heads, generally afford great relief where there is much irritation and itching in the parts. I have also employed a weak solution of the sulphate of morphia, in the proportion of a grain to two ounces of water, for this purpose, with the happiest effect. After having continued this course of management for nine or ten days, or until the inflammation and itching are moderated, we may have recourse to applications of a more active character. I have been in the habit of using the *unguent. zinci. oxidi*, for this purpose, and in general with entire satisfaction. It should be spread on a slip of fine linen, and laid over the affected part, having previously washed away the offensive secretions. This ointment is particularly useful in mere excoriations behind the ears. The citrin ointment reduced by adding an equal portion of fresh lard, is also an excellent application in this affection. It should be spread thinly on a soft piece of linen and laid on the sores during the night. In the morning, the parts should be carefully washed with warm water and fine soap, and then dressed with the ungt. zinci. oxidi. Dr. Dewees strongly recommends the use of calomel ointment, "to be smeared upon the external margins of the sores, as well as upon the sound skin itself, twice daily, taking care that the parts be carefully washed before each application of the ointment, and gradually encroaching upon the sores every day, by a more extensive application of the ointment." I have used an ointment, prepared by triturating twenty grains of very finely pulverised red precipitate, with half an ounce of lard, in the way recommended by Dr. Dewees, for the calomel ointment, with peculiar advantage.

The infant's diet should be carefully regulated. If it is weaned, no animal food of any kind should be allowed. It must be confined to a milk and vegetable nourishment, such as arrow root, sago, barley, oat-meal gruel, and rice. If the child is still nourished at the breast, it should be less frequently suckled, and small portions of a mixture of cows milk and water, barley water, or very thin oat-meal gruel allowed.

3 *Strophulus Confertus. Tooth Rash.*—This affection is peculiar to infants at the breast, and is manifestly intimately associated with dentition. It consists in an eruption of papulæ, "seated chiefly on the cheeks and forehead, when they occur about the fourth or fifth month, and are smaller, more crowded together, and less vivid in their color than in the affection called *red gum*," to which in other respects it bears a close resemblance. When they occur in children at a more advanced age—that is, about the seventh or eighth month, which is by no means uncommon, they appear in large irregular patches on the outside of the hands, arms, and shoulders, and are hard and close set, so as to give to the whole surface a high red color." These papulæ, never assume a chronic character. They usually continue about twelve or fourteen days, when they begin to fade and desiccate, and gradually disappear. In some instances, though rarely, this variety of strophulus appears on the the legs, extending in a short time to the loins and naval, imparting a uniform redness to the cuticle, "which cracks and separates, in large pieces, occasioning much distress to the child." This affection is but very seldom attended with constitutional disturbance, unless it assumes the severe form, that has just been mentioned. Not unfrequently it is attended with very troublesome itching, by which the infant is sometimes much disturbed during night. In the majority of instances, however, no particular inconvenience attends the eruption; and children often appear perfectly healthy during its continuance.

If the gums are swollen and inflamed, from dentition, they should be freely lanced. The bowels should be kept in a loose condition by magnesia or castor oil, with an occasional small dose of calomel in the evening. The affected parts should be kept

clean by repeated ablutions with tepid milk and water; and after each washing, a little flour or fine hair powder should be dusted upon them. Every thing capable of irritating the skin, such as flannel or muslin should be removed from the diseased parts.

4 *Strophulus Intertinctus. Red Gum.*—This variety of strophulus seldom occurs after the sixth week of infancy, and consists in papulæ of a vivid red color, appearing "most commonly on the cheeks, fore arms, and back of the hands." In many instances, however, the eruption is universally diffused over the whole surface giving it a uniform bright red color, not unlike the rash of measles. The papulæ are generally distinctly separated from each other, and "are intermixed with minute red dots or stigmata, and often with large red patches, which have no elevation."

This eruption appears to be intimately connected with a deranged state of the alimentary canal; for in most instances, sickness of the stomach, with griping and diarrhœa, precede the appearance of the rash. A debilitated state of the digestive organs from errors in diet, giving rise to acid, and other irritating causes in the stomach and bowels, appears to be the ordinary source of this affection. Its occurrence is doubtless much favored, by keeping the infant too warm,—an error which is but too frequently committed by nurses and mothers. In its ordinary and mild form, this eruption is rarely attended with any manifestations of general indisposition. The bowels, indeed, are frequently more or less disordered, but this does not often create any obvious illness or general disturbance.

This disease does not often require any active medical treatment. Ablutions with warm water, and the occasional use of the tepid or warm bath, so as to keep the skin free from sordes, and promote the regular action of the cutaneous exhalents, may be resorted to with advantage.

Mild aperients, also, are useful. Small doses of magnesia and rhubarb, should be given to keep up a moderate looseness of the bowels. The following combination has appeared to me peculiarly useful for this purpose.* If the child is affected with colic

* ℞. Magnes. Calc. gr.iv; P. Rhœi gr.ii; Pulv. rad. valer. gr.ii. M. To be given at once.

pains or griping a drop of laudanum or four or five drops of tinct.opii camphorata should be given after the operation of the laxative. "The cold bath or even exposure to a stream of cold air should be avoided" during the continuance of the eruption; for if in consequence of want of caution in this respect, the rash is repelled, very alarming effects will be apt to ensue. Oppressed breathing, drowsiness and stupor, severe colic pains, rapid and exhausting diarrhœa, and convulsive affections, may arise, in consequence of the sudden retrocession of the eruption. When this occurs the infant should be immediately put into a warm bath, and some wine whey, or a few drops of the compound spirit of ammonia administered. It should be kept in the bath until the skin has acquired warmth; and when removed, it must be well dried, and wrapped up in warm flannel. Sage, marjoram, or catnip tea, may be given with advantage in this condition; and where the symptoms are severe and obstinate, a blister laid between the shoulders, may afford great benefit.

5. *Strophulus Volaticus.*—This is by no means a common complaint. It consists in small circular patches of papulæ, appearing and disappearing successively on different parts of the body. There are seldom more than ten or twelve papulæ in one cluster; and "both the papulæ and the interstices between them are of a vivid red color." The eruption is generally attended with considerable heat and itching, and in most cases, a slight degree of febrile irritation occurs. About the fourth day these patches begin to turn brown, and soon exfoliate; so that "the whole series terminates in three or four weeks. In some instances, not more than three or four clusters of papulæ make their appearance, and these are usually situated on the fore arms and cheeks. Inmany cases, however, as one patch declines, another makes it appearance "at a small distance from it, and in this manner the complaint gradually spreads over the face, body, and limbs."

The pulse is generally accelerated, the tongue covered with a white fur, the skin very warm and not disposed to perspire, while the little patient is sometimes unusually restless and uneasy. This eruption seldom occurs during the first nine months after

birth. Dr. Dewees observes, that "it has always, according to his observations, appeared later than is usually described, or not until the child was about cutting the first jaw teeth." This accords entirely with my own experience. I have never witnessed this eruption before the ninth or tenth month, and most commonly about the period mentioned by Dr. D. This affection would seem to be intimately connected with a disordered state of the stomach and bowels; for in most instances, the evacuations are either very unnatural, or the child is manifestly troubled with acidity, flatulency, and griping stools.

The diet should be of the simplest and most unirritating kind, more especially, when the eruption is attended with febrile irritation. Milk, arrow root, sago, grated crackers dissolved in warm water, oat-meal gruel, and rice, form appropriate articles of nourishment in this affection. Gentle purgatives will be useful throughout the whole course of the complaint. Very small doses of calomel in the evening, with a moderate dose of magnesia or castor oil on the following morning, will answer very well for this purpose. The affected parts should be frequently washed with warm milk and water; and when the eruption is severe and obstinate, the application of reduced citrin ointment, or calomel ointment, as directed for crusted lactea, should be resorted to. When the bowels become much affected with griping and diarrhœa, minute portions of calomel in union with ipecacuanna, should be administered three or four times during the day, with an occasional dose of castor oil, and a few drops of laudanum in the evening. The warm bath also, is very useful in such cases. When the eruption is about drying up, and the bowels have been properly evacuated, mild chalybeate preparations may be employed with considerable benefit. Bateman recommends a watery solution of the tartrite of iron for this purpose, "as particularly adapted from its tasteless quality to the palates of children and possessed of more efficacy than vinum ferri."

CHAPTER XLIII.

INFLAMMATION AND ABSCESS WITHIN THE EAR.

INFANTS are sometimes affected with inflammation, terminating often in abscess within the ear, which as they can give no distinct account of their sensations, is apt to be mistaken for some other painful affection, and is consequently often either entirely neglected or mismanaged. Children affected in this way are, at times, extremely restless, leaning the head to one side, or moving it from side to side, with frequent spells of vehement and unappeasable crying, and a countenance expressive of great suffering. At night the child is apt to awake and cry violently for some time, after which it sinks into a sound and quiet sleep, "from which it will, probably, be roused by renewed torture." There is seldom any distinct febrile irritation connected with this painful affection; and it is on this account, probably, that these distressing pains, were formerly generally regarded as of a spasmodic character. This affection may be distinguished from colic, for which it is frequently mistaken, by the paroxysms of suffering being free from the agitation and retraction of the inferior extremities, so constantly observed in severe abdominal pains. The hands and feet too are warm, which is seldom the case in colic. Dr. Dewees observes, "that we have always reason to suspect this pain to arise from an abscess forming in the ear, when the child throws its head backwards and forward, and indeed in all directions during the paroxysm of pain." One of the most certain indications, however of this affection, is obtained by pressing with the point of a finger, "against the lower portion of the external meatus." If the child shrinks and cries when pressure is thus made and the symptoms already mentioned are present, there can be little if any doubt, that an abscess is forming in the ear. Children affected in this way, seldom rest easy, when lying on the af-

fected side. In some instances, after the abscess has made considerable progress, it may be seen by looking into the ear.

There can be no doubt however, that extremely violent pains within the ears, often occur, without either inflammation or abscess. We frequently meet with cases, which come on suddenly, and after having continued for some time, with occasional intermissions, as suddenly disappear, without any further inconvenience. The pain in cases of this kind is usually extremely intense, and may in general be speedily relieved by dropping some laudanum into the ear, or taking a full dose internally, and placing the feet in warm water. When the pain depends on inflammation or abscess, laudanum procures but slight and temporary relief.

When the formation of the abscess is not prevented by prompt and appropriate remedies, it continues to torture the little patient, until it bursts and the mattter issues from the ear. When this occurs, all the pains suddenly subside, and the child becomes perfectly easy. Occasionally, however, when the first abscess has discharged its contents, a second one commences and passes through the same painful course, and thus a third and even a fourth abscess may occur and protract the sufferings of the child, with occasional intermissions, for several months. In some instances serious and irremediable injury is done to the organ of hearing. "The small bones of the ear become detached by suppuration, and are discharged with the pus which constantly flows from the external orifice of the organ." The pus in these cases generally acquires an acrid, thin, and extremely offensive character, inflaming and excoriating the external parts with which it comes in contact. Fortunately, however, these severe and distressing cases are by no means common. In a great majority of instances the abscess heals without much difficulty, and leaves the ear in a perfectly healthy condition. Not unfrequently the posterior part of the meatus becomes excoriated, or affected with chronic superficial ulceration, without any serious injury to the organ of hearing; and these cases are attended with a thin seropurulent discharge from the ear, which often continues for seveal years. These chronic discharges from the ear, are almost always

attended with dullness of hearing, and in some instances this organ never regains its original acuteness.

When there is reason to believe that the sufferings of the child arise from inflammation and the formation of an abscess in the ear, five or six leeches, if practicable, should be applied behind the ears or on the mastoid region. A few drops of laudanum should be instilled into the ear, and an active purgative of calomel and rhubarb administered. The application of a blister under or behind the ear, is however, in general more effectual in arresting the progress of the complaint than any other means we possess. By the prompt employment of these remedies, when applied before suppuration has commenced, we may in general, remove the complaint without much difficulty; "but unfortunately the time for useful exertion is almost always lost, by a trial of temporizing applications, and we have but too often the mortification to witness only the discharge from the ear."

When the disease has advanced to this stage, we must endeavor to promote the healing of the abscess, and to prevent it from degenerating into a chronic discharging ulcer. For this purpose, it is of great importance to keep the affected parts as clean as possible, by repeatedly throwing warm milk and water into the ear with a small syringe. If, after these mild injections have been used for several days, the discharge from the ear continues, a weak infusion of peruvian bark, or warm water mixed with tincture of myrrh, (in the proportion of twenty drops of the latter, to half an ounce of the former) should be thrown into the canal three or four times daily, immediately after the secretions have been washed away with the milk and water injections. Dr. Dewees recommends, for this purpose, a mixture of lime water and milk, with a small portion of the tincture of myrrh.* "This mixture should be prepared only as it is wanted, and thrown into the ear four or five times a day." In cases of an obstinate character, where there is a constant discharge o offensive matter from the ear, without any particular pain or uneasiness from the affection, a weak solution of the *nitrate of*

* Lime water and milk, of each two tea spoonfuls; tincture of myrrh, twenty drops. Mix.

silver, as recommended by Curtis, is frequently very beneficial. In four or five instances of this kind I have employed this solution with complete success. Four grains to an ounce of water forms a solution of proper strength for this purpose. In obstinate chronic purulent discharges from the ears, Buchanan asserts that he has used a weak mixture of pyroligneous acid, as an injection, "and found it to surpass his most sanguine expectations, in diminishing the discharge, and almost immediately restoring the hearing." He states that he has made repeated trials of this injection, and almost uniformly with entire success. "I may venture to say," he continues, "that a more valuable medicine than pyroligneous acid, has not been introduced into acoustic surgery either in this or the last century." It may be used in children according to the following formula:

℞ acid. pyrolign. ʒi.
Aq. distillat. ℥vi.
Ft. injectio.

The mode of using it, is first to wash out the meatus, with tepid water, and then to inject the mixture "so as to be directly applied to the abraed or ulcerated surface."

The insertion of an issue in the arm, or on the back of the neck, has been known to arrest the progress of this affection; and Dr. Dewees "thinks he has seen some advantage derived from the little patient wearing a burgundy pitch plaster under the affected ear."

The child should be made to lie on the affected side, when in bed, in order to prevent an accumulation of the offensive matter in the bottom of the meatus.

A TABLE

EXHIBITING THE DOSES OF MEDICINES,

ACCORDING TO DIFFERENT AGES.

	Adult Age.	From 4 to 7 years.	From 3 to 1 years.	
Aloes, soccotrine	10 to 15	5 to 3	2 to ½	grains.
Antimonial Wine	℥ij to ℥ss	℥j to ℥ij	20 dr.– 40	
Antimonial powder	6 gr. – 8	2 gr.– 4	½ gr.– 1	grains.
Ammonia Carbonate, salt of hartshorn	6 gr. – 12	4 gr.– 2	½ gr.– 1	grains.
Aqua Ammonia, spirit of hartshorn	10 dr. – 20	5 dr.– 10	1 dr.– 2	drops.
Assafœtida gum	10 gr. – 20	5 gr.– 10	3 gr.– 1	grains.
Calomel	10 gr. – 20	5 gr.– 10	4 gr.– 2	grains.
Camphor	6 gr. – 10	2 gr.– 4	1 gr.– ¼	grains.
Charcoal powder	℈j to ʒj	10 gr.– 20	10 gr.– 4	grains.
Cream of tartar	ʒj to ʒss	℈j to ʒss	℈j to 10 gr.	
Carbonate of Magnesia	ʒj to ʒij	℈j to ʒj	℈j to 10 gr.	
Carbonate of potass	10 gr. – 30 gr.	5 gr.– 10	5 gr.– 2	grains.
Carolina pink-root, powdered root	ʒj – ʒij	℈j – ℈ij	20 gr.– 10	gr.
Carolina pink-root, infusion ʒss to one pint of water	ʒiv to ʒviii	fl	ʒij – ʒss	fl.
Castor oil	ʒj to ʒjss	ʒss – ʒj	ʒij – ʒj	fl.
Chalk, prepared	℈j to ℈ij	10 gr.– 20	6 gr.– 3	gr.
Croton oil	1 gtt. to 2 gtt.	1 gtt.– ½	¼ gtt.– $\frac{1}{10}$	drop.
Dandelion Extract	ʒj – ʒij	℈j to ʒj	℈j to ℈ss	
Colomba root, powder	10 gr. – 30 gr.	5 gr.– 10	3 gr.– 1	gr.
Colocynth, compound extract of	10 gr. – 20	6 gr.– 10	5 gr.– 2	gr.
Corrosive Sublimate, as an alterative	⅛ gr. – $\frac{1}{16}$	$\frac{1}{20}$ – $\frac{1}{12}$	$\frac{1}{20}$ – $\frac{1}{30}$	gr.
Dewberry root, decoction, ʒj to one pint of water	ʒij – ʒiv	ʒj – ʒjj	ʒj to ʒij	fl.
Dovers powder	8 gr. – 12	4 gr.– 6	3 gr.– j	gr.
Elixir of Vitriol	10 gtt. – 30 gtt.	6 gtt. – 15 gtt.	5 gtt. – 3 gtt.	drops.
Emetic tartar, repeated doses	2 gr. – 3 gr.	½ gr.– 1 gr.	½ gr.– $\frac{1}{6}$	grain.
Epsom salts	ʒj to ʒjss	ʒij – ʒss	ʒj – ℈j	
Essence of peppermint	20 gtt. – 30 gtt.	5 gtt. – 10	3 gtt. – 1 gtt.	drops.
Ether sulphuric	20 gtt. – 30 gtt.	5 gtt. – 10	4 gtt. – 2	drops.

	Adult Age.	From 4 to 7 years.	From 3 to 1 years.	
Extract of butternut, laxative	20 gr. – 30 gr.	6 gr.– 15	5 gr.– 2	grains.
——— of Belladonna	½ to j gr.	⅛ to ½	⅛ – 1/20	grains.
——— Hyoscyamus, henbane	2 to 10 gr.	½ – 1 gr.	¼ – ⅛	grain.
——— of Gentian.....	6 to 10 gr.	1 gr.– 5	2 gr.– ¼	gr.
Foxglove, digitalis, powder ..	1 to 4 gr.	⅓ to ½	¼ – 1/10	gr.
Gamboge—cathartic.....	1 to 4 gr.	¼ – ½	¼ – 1/10	gr.
Geranium root, Cranesbill root, decoction, ℥j to one pint of milk or water	℥ij – ℥iv	℥j – ℥ij	℥ss – ℥ij	fl.
Glauber Salts	℥j – ℥jss	℥ij – ℥ss	℥j – ℥ss	
Hartshorn Salt	6 gr. – 12 gr.	4 – 2 gr.	½ – j	gr.
Hive Syrup, as an emetic ...	.....	.....	30 gtt.– 10	drops.
Hoffman's Anodyne	30 – 40 dr.	10 –15 dr.	8 – 3	drops.
Huxham's tincture of bark ..	ʒj – ʒij	ʒss – ʒj	15 dr.– 5	fl.
Iron filings, tonic	10 –20 gr.	5 –10 gr.	3 – 1	grains.
Iron, Muriated tincture of...	10 gtt. – 20	5 –10 gtt.	4 – 2	drops.
Iron, Phosphate of.....	20 – 40	5 – 10	3 – 2	grains.
Iron, Prussiate of	10 – 15	4 – 8	3 – 1	gr.
Iron, Tartrate of.....	ʒss – ʒj	10 gr.– 20	6 gr.– 2	grains.
Iron sulphate.....	½ – 2 gr.	⅙ – ½	⅛ – 1/12	
Iodine, tincture of— ʒj to ℥j of alcohol	10 gtt. – 15	3 – 5 gtt.	2 – ½	drop.
Ipecacuanha powder.....	℈j – ʒss	8 gr.– 12	5 – 3	gr.
Jalap powder.....	℈j – ʒss	8 gr.– 12	6 gr.– 2	gr.
Kino, gum powdered	10 –20 gr.	4 gr.– 6	2 – 1	grains.
Lactucarium—lettuce opium	2 – 4 gr.	⅓ – 1 gr.	¼ – 1/10	grains.
Laudanum, tincture of opium	20 gtt. – 40	5 –10 gtt.	5 gtt.– 2	drops.
Lime water.....	℥j – ℥iv	℥j – ℥ij	℥j – ℥ss	fl.
Magnesia, calcined.....	ʒj – ʒij	℈j – ʒj	℈j –10 gr.	
———, carbonate.....	ʒj – ʒij	℈j – ʒj	℈j –10 gr.	
Manna	℥j – ℥iv	℥ij – ℥ss	℥j – ℈j	
Milk of sulphur	℥ij – ℥iij	℥j – ℥ij	℥ss – ℈j	
Morphia.....	¼ gr.	1/24 – 1/10	1/30 – 1/40	gr.
———, sulphate of—the same dose as morphia.				
Nitre—Salt-petre	10 gr. – 30	4 – 6 gr.	3 – 2	grains.
Oil of Peppermint	10 gtt. – 20	3 gtt.– 6	2 – 1	drops.
Oil of Juniper.....	10 gtt. – 20	3 – 6	2 – 1	drops.
Oil of Turpentine.....	20 gtt. – 100	6 – 12	5 – 3	drops.
Oil of Wormseed.....		6 gtt.– 10	5 gtt.– 2	drops.
Opium	1 gr. – 3	⅛ – ⅓	1/10 – 1/20	grains.
Oxyd of Zinc	2 – 6 gr.	¼ – ½	⅙ – 1/10	

	Adult Age.		From 4 to 7 years.		From 3 to 1 years.		
Paragoric Elixir	℥ij	– ℥iij	℥ss	– ℥j	℥ss	– ℈j	fl.
Peruvian Bark	℥j	– ℥ij	15 gr.	– ℥ss	15 gr.	– 8	gr.
Pink-root powder	℥j	– ℥ij	℈j	– ℈ij	℈j	– 10	grains.
Quinine	gr. j	– 5	½ gr.	– 1 gr.	⅓	– ¼	gr.
Rhubarb, powder	℥ss	– ℥j	12 gr.	– ℈j	10 gr.	– 8	grains.
Snake-root, Senega, decoction, ℥j to 1 pint of water	℥j	– ℥ij	℥jss	– ℥ss	℥jss	– ℥j	fl.
Soda, Carbonate of / Soda bi-carbonate	10 gr.	– ℈j	6 gr.	– 12	6 gr.	– 3	gr.
Spirit of Camphor	20 gtt.	– 30	6 gtt.	– 12	5 gtt.	– 2	drops.
Sulphur, Flowers of	℥j	– ℥ss	℈j	– ℥j	℈j	– 10	grains.
Sweet Spirit of Nitre	℥j	– ℥iij	℈j	– ℥j	℈j	– 10	fl. dps.
Syrup of Squills	℥j	– ℥ij	℈j	– ℥j	℈j	–12 gtt.	
Syrup of Rhubarb	℥j	– ℥iv	℥j	– ℥ss	℥j	– —	fl.
Tinct. of Assafœtida	20 gtt.	– 40	10 gtt.	– 20	10 gtt.	– 5	drops.
—— of Blood-root, sanguinaria	20 gtt.	– 30	8 gtt.	– 15	6 gtt.	– 3	drops.
—— of Foxglove	20 gtt.	– 30	6 gtt.	– 10	5 gtt.	– 2	drops.
—— of Belladonna	20 gtt.	– 30	5 gtt.	– 10	4 gtt.	– 2	drops.
—— of Lobolia inflata	℥j	– ℥ss	℈j	– ℥j	℈j	– 10	drops.
—— of Peruvian bark	℥j	– ℥ij	℈j	– ℥j	℈j	– 12	drops.
Uva Ursi,—decoction, ℥j to one pint of water	℥ij	– ℥iv	℥ss	– ℥j	℥ij	– ℥j	fl.
Wormseed	℥ij	–	℈ij	– ℥j	℈ij	– ℈j	
White Vitriol, as an emetic.	gr. 10	–	gr. 4	– 6	gr. 3	– 2	

EXPLANATIONS.

The mark ℥ signifies ounce.
℥ ——— drachm, or ⅛ of an ounce.
℈j ——— scruple, or ⅓ of a drachm.

The letters ss. signify *half;* thus, ℥ss, stands for *half* an ounce; ℥ss, for half a drachm; gtt. stands for drops; so also do the letters, dr.; fl, signifies fluid;—thus, ℥j fl, means one fluid drachm: gr., stands for grains.

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