Augustus A Biggs
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ELEMENTS

OF

THE THEORY AND PRACTICE

OF

PHYSIC.

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THE THEORY AND PRACTICE

OF

PHYSIC,

BY

GEORGE GREGORY, M. D.

WITH

NOTES AND ADDITIONS,

ADAPTED TO THE PRACTICE OF THE UNITED STATES,

BY

NATHANIEL POTTER, M. D.
PROFESSOR OF THE PRACTICE OF PHYSIC IN THE UNIVERSITY OF MARYLAND,

AND

S. COLHOUN, M. D.

"IN MORBIS, SIVE ACUTIS, SIVE CHRONICIS, VIGET OCCULTUM QUID, PER HUMANAS SPECULATIONES FERE INCOMPREHENSIBILE."—BAGLIVI.

SECOND AMERICAN FROM THE THIRD LONDON EDITION,
WITH NUMEROUS ADDITIONS AND AMENDMENTS.

IN TWO VOLUMES.

VOL. I.

PHILADELPHIA:
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1829.

ADVERTISEMENT TO THE THIRD EDITION.

In the year 1826, an Edition of this Work was published at Philadelphia, with very copious Notes and Additions by Dr. Potter, Professor of the Practice of Physic in the University of Maryland, and Dr. Colhoun of Philadelphia. In preparing the present edition for the press, the author has not neglected the opportunity thus offered him of enhancing its value. He desires to offer his testimony to the merits of the American Editors, who with great judgment have filled up parts of the work which had been but briefly sketched; and by their notice of many American drugs unknown to the Author, and by their greater familiarity with the diseases of warm climates, have added largely to its general utility.

It would be superfluous to specify in detail the different chapters which have now undergone alteration. The whole has been thoroughly and carefully revised. Several topics, unnoticed in the preceding editions, have been introduced, such as Delirium tremens, Cachexia africana, Hepatalgia, Erythema nodosum, &c. Many have been considerably expanded; and throughout the work, the results of the author's recent experience will be found united with the most important practical suggestions of late writers.

GEO. GREGORY.

London, Upper St. John's St. Golden Square,
June 12, 1828.

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ACUTE DISEASES.

PREFACE.

Any commendation of the following work would be almost superfluous. Its own intrinsic worth is its best eulogy; but it is only to those who are well versed in practical lore, that it will bear *prima facie* evidence of its own superior excellence. The young and inexperienced cannot duly estimate a system which constitutes a rather converging series of maxims, than the minutiæ of practical detail. The author seems to have composed it as a syllabus, from which he has left himself at liberty to expatiate in all the latitude which great erudition, faithful observation, and ample experience justify. If we were inclined to adopt a text-book, as a guide to a practical course, Gregory's Practice would claim a preference to all other works.

The author has presented his work in the most interesting garb, by combining the etiology, pathology, and symptomatology, in the series of cause and effect. This scheme has been executed with so much felicity, in so small a compass, that it becomes a real treasure to both preceptor and pupil. The former finds his experience confirmed, and the latter has only to dig, to find a mine more precious than silver or gold. How many of our practical books are almost destitute of all the laws of pathology, are nearly empirical, and therefore in the exact ratio of their defect of principle, indifferent or useless!—Nor are these the only merits of the work. We must bestow on the author his due meed of praise for disclaiming that fastidious adherence to nosological distinctions, to which we think so many of his countrymen unduly attached. We do not predicate this reflection on existing systems of nosology or on a conviction that a perfect synoptical arrangement of diseases will be

forever impracticable; but from the belief, that all the systems hitherto proposed are erroneous, and perhaps radically wrong. We venture to predict, that no perfect, or even very useful system of nosology will ever be devised, unless it shall have been predicated upon the natural and obvious division of the human body, into various departments, according to their difference of organizations. The elective attraction of the causes of diseases for some textures in preference to others, as well as a natural preference of medicine for one organ rather than another, indicate the necessity of reverting to first principles, before we can construct nosological tables upon a philosophical basis.

The learned and judicious author not only reasons well from just premises, deducing legitimate practical conclusions, but has broken some of the strongest habitual associations. He does not believe that the constitutions of the British people have so degenerated, that they cannot sustain the rigour of the antiphlogistic treatment adopted and so triumphantly pursued by the immortal Sydenham. The sanguinary practice so familiar to us, would not alarm him, who well knows it is not debility, but disorganization that is to be apprehended in fevers and inflammations. This rotten excrescence of the Brunonian doctrine, had been already extirpated by his countrymen Mills, Armstrong, and some others. The most prominent feature in his character seems to be his judgment, or that gift of nature which confers on a few distinguished individuals the faculty of discriminating between the true and the false, almost intuitively, certainly without any tedious process of reasoning.

N. POTTER.

INTRODUCTORY DISCOURSE.

On the nature of Medical Causes and Effects—Difficulty of ascertaining the causes of Medical Phenomena—Mode of investigating them—Remarks on two of Sir Isaac Newton's Rules of Philosophy, as they have been applied to Medicine—On Hypothesis—On Theory—On Invention—On Observation, the true means of cultivating Medicine—On some of the sources of error discovered in the history of Medicine—On the climate, modes of living, and diseases of the United States.

The object of the science of medicine is the prevention and the cure of diseases. Though the noxious agents which surround us are numerous, yet nature supplies, in some measure, the means of preventing and curing their bad effects. Thus the exhalations from putrefying animal matter produce fever; and their disagreeable and horrible stench is a sufficient warning to avoid them: if fever has taken place from this cause, the delirium, and the morbid heat of skin which attend it, inspire an instinctive disposition to plunge into cold water; and the relief produced by it is immediate, and generally certain.

The power of nature alone, though great, is not, however, always sufficient, either to discover these noxious agents, or to remove the diseases produced by them: thus the miasmata from vegetables, though equally baneful with those from animal matter, often give no warning by their smell, and destroy without their danger being anticipated. This is true with regard to many other noxious agents: thus sudden exposure to mephitic airs in descending below the surface of the earth, takes away life; and no instinct, no sense, warn us of our danger. We therefore require other aids than those of nature alone, in avoiding the causes of diseases; and it is the province of the science of medicine to supply them, by a cautious examination of the properties of bodies around us.

Though diseases are often relieved without the assistance of art, yet it is well known that many processes undertaken by nature to repair any injury, are often too violent, and destroy life. Here then art assists; and in doing so, the properties and nature of the system, as also those of external bodies, must be studied, to discover their effects upon it. The mind and the senses, accordingly, are the instruments by which this end is effected. In their application for the purposes of discovery to the world around us, great errors have been committed, and much useful time and labour has been lost, in their direction to the practical duties of our profession.

In the following remarks, therefore, as medicine is a science which teaches something to be done, and the most correct mode of doing it, and as it uses natural agents to effect its purposes, we shall first consider the nature of cause and effect, in relation to the production and the cure of diseases; and secondly, the sources of the errors of medicine, discovered in the history of its past ages. We shall thus be enabled to pursue our way upon the firm and open road opened by modern discovery, with profit and advantage.

ON THE NATURE OF MEDICAL CAUSES AND EFFECTS.

Our knowledge of external nature is derived from bodies, either at rest or in motion. Upon each of these states, some remarks suggest themselves: first, with regard to the operations of the mind in receiving knowledge from bodies at rest.

When we look upon a mass of snow, the mind receives an impression, the result of the combined action of the particles of which this substance consists: it presents a white aggregate, which is cold, soft, &c.; into the idea of which enters simply a number of minute juxtaposed bodies. Regarded in this light, it is a whole, a mass totally distinct and separate from all other bodies around it.* The mind, however, can take other views; for the mass of snow is composed of other substances, since it can be separated into oxygen and hydrogen; two bodies possessing still different properties: these again can be separated still farther into heat, light, and certain bases.

In these views, the mind considers the snow, as perfectly at rest, and composed of a certain number of bodies, arranged with regard to each other in certain relations,† and each of these are grouped together in a defined series. The same is true of the anatomy of the human body. That science considers the various structures, as they lie with regard to

* Brown's Lectures on the Human Mind. † Ibid.

each other, in the system; and thus separates them, part after part; and acquires a knowledge of their situation, and the mode in which they operate upon each other, when set in motion.

The mind, therefore, though the subject it contemplates is entirely at rest, exerts a great modifying power over the knowledge it gains from without: for when we contemplate the mass of snow, we may either consider it simply as a collection of white particles: or we may go further, and regard these, as composed of other particles; these again of other components.* At each step the body is considered as composed of a series of groups, each group being regarded as an individual, though its component parts are numerous, and have each very different qualities. The same is true in anatomy. The whole system, composed of a variety of different substances may be regarded as a whole; or may be analysed into bone, muscle, nerve, tendon, blood vessel, &c.: each of these may be considered as also composed of particular aggregates of matter; as the muscles are formed of fibres of a peculiar kind, of nerves and of blood-vessels; these fibres, nerves, and blood-vessels are composed of other aggregates, till separating aggregate from aggregate, we arrive at the ultimate result of which the science is capable. At each step, however, there are the same number of particles combined in the whole or in each group, but by the mind, they are differently viewed and assembled into masses. This disposition to analyze and separate bodies from each other, enlarges the range of our power, and it is by thus parting the groups of natural bodies from each other, that the power and effect of each, is appreciated, and our knowledge increased. It is, however, only an act of the mind, for the snow and the body are the same, whether considered as a mass, or as an assemblage of organs, or of particles composed of various ultimate atoms. It is one great principle of science, thus continually to oppose and counteract this disposition of the mind, to mass into groups, and to take too partial, or too general views of the various subjects of nature, and thus to discover by analysis, her various combinations; chemistry in the decomposition of bodies—anatomy in the separation of the different parts of the human body, by the knife, consists in this simple process; the same mode of investigation applies to the phenomena of disease, both in understanding their nature, and in curing them.

1st. With regard to their production. If the substance, which gives hardness to the bones, be removed, they become flexible, the body by its weight crooks the limbs, and walking is performed with difficulty. The chest, which contains the lungs and the heart, presses upon these organs:

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* Brown's Lectures on the Human Mind.

the lungs do not dilate sufficiently, breathing is performed with difficulty, and the powers of life are impaired.

If a bone be displaced at the joint, the natural and relative situation of the parts, of the muscles, the tendons, and the blood-vessels, are deranged, and the limb becomes useless. To understand exactly the state of the parts in these diseases, it was necessary, originally, in the first case to analyze the bones, to know that a certain substance, the phosphate of lime, was wanting, and to communicate this earth in greater quantities to the system, and by a proper mode of cure to fix it in that structure in which it is deficient: in the second case, to apply an apparatus, which may bring into play the power of the muscles, which favour the reduction, and throw out of operation those which oppose it, and thus restore the bone into its place: thus by a particular motion, the luxation of the thigh, at the hip, has been reduced in a moment, when without this happy effort of skill, it would have required immense power applied to the limb, with great suffering to the patient. Pathology and chemistry then separating the groups of facts thrown together by nature, before the mind in the one case, and anatomy in the other, furnishes the knowledge necessary for the cure. This system of analysis, which looks with an eye of scrutiny into the various masses and groups of natural phenomena presented in the human system, separating those which are united in the exact relation of cause and effect, and which the mind is so prone to view combined with others, in a confused and jumbled aggregate, is of the greatest importance, and it is by this process of separation, that science operates in conferring its benefits upon mankind.

Let us then examine how this is effected. In proportion to the mass of correct ideas, acquired by the mind, are the capabilities of its usefulness increased. For this purpose it is supplied with certain instruments —the senses.

The mind may be considered as the granary, into which the senses, as the labourers, collect knowledge for future purposes. The wider the range of the power of the latter, the greater will be the harvest gathered by them. Thus the telescope by enlarging the sphere of vision, has discovered new phenomena in the heavens; and the tests of chemistry are assistant agents in rendering sensible qualities which would otherwise have passsed unobserved on the earth. The microscope may probably be employed to discover properties now unknown, and introduce us to a world of objects near to us, as vast and as curious for its minuteness, as that of the great and distant objects, which the telescope has demonstrated.

It is thus, then, by increasing the power of the senses, that science becomes more productive. When, however, we look around us, and

find that all nature, instead of being at rest, presents a scene of constant motion and change, connected and hung together in a series of indissoluble links, we are led to examine other relations of bodies; relations which constitute the most essential parts of all knowledge—those of cause and effect. In medicine, their history is that of the origin and the cure of diseases; it therefore deserves minute and accurate investigation. Let us examine a few instances. Arrest the supply of oxygen to the lungs, and life ceases in the more perfect animals. Continued frost stops the fevers of summer. Emetics produce a discharge of the contents of the stomach. In all these instances, the effect is invariably and indissolubly connected with its cause. They have continued the same from the earliest observation, and will do so to the end of time. Cause and effect are, therefore, the most important considerations of medical and all other sciences.

What then is the nature of this indissoluble vinculum, which thus binds, for ages, in one continued series, the agents of physical nature together?

When we contemplate the air, and the life of the animal, the emetic and the stomach, continued cold and certain fevers, we can discover no intermediate agent from which the effects produced, could, prior to experience, be inferred. The contact of the air with the lungs, of the emetic with the stomach, the appearance of frost, and their results, are all we know with regard to these phenomena. The first, the air, the emetic, and the frost, are called causes, as they produce certain phenomena, which are called effects; and as they follow them invariably, we expect the appearance of the one as the result of the operation of the other; a wise provision of nature, upon which all our operations in the regulation of our happiness is founded. Thus when a patient faints, or when life is suspended, the air is admitted more freely to facilitate recovery. When poison is taken into the stomach, an emetic is administered, or it is withdrawn by a syringe and a tube, because the qualities of the air in the resuscitation, and the emetic or the syringe and tube in discharging the contests of the stomach, are powerful; they have been and always will be the same; we therefore operate with confidence, and success attends our efforts; and this certainly depends upon the observation of the power of these respective agents to produce these certain and specific effects, and is the result of repeated experience. The essential and intimate nature of this power, however, cannot be understood. All we know of it is the observance of its general properties, and the circumstances which modify them: thus, invariable antecedence is an essential attribute of a cause, as invariable consequence is of an effect, unless some adequate agent intervene to prevent it.* On the application of the finger

* Med. Record. p. 120, No. 33.

to the blaze of a candle, pain is produced; the effect is uniform, and we avoid it ever after; and because the pain invariably follows the application of the blaze, which must as invariably precede, they possess one requisite of the relation of cause and effect. But in order to complete the relation of cause and effect, something more is necessary than mere antecedence: thus day precedes night, and night precedes day, and yet they are not the cause of each other, but both flow from the effect of the same agent, the sun; day appearing as he rises, and night succeeding as he disappears.

This something is the simple and constant observation of the effect, as the result of the cause; and it is the province of philosophy accurately to determine all those circumstances, which contribute to produce the effect, to separate those which oppose it, and to ascertain their power; so that the resources of nature may be constantly within our reach, by an accurate knowledge of their causes. Thus it is, that by commanding the causes of things, we control also their effects. The conviction of the power of a cause must be clear and decided; and it is proportioned always to the frequency of the instances in which it has been observed to produce the effect, provided there exist no collateral circumstances, to which it can also be attributed: thus, the effect of the sun in producing day has been so constantly and frequently witnessed, that it is impossible not to attribute it to that cause. When, however, a cause is observed less frequently, there will be some doubt with regard to it; and this will be in proportion to the rareness of the observations made. Thus the fevers of summer have been attributed to bad food, bad water, and to mineral effluvia; and as the system is often exposed to these agents, it is difficult to determine from observation, what is the exact power of each, or whether they have any agency, since they frequently operate on it at the same time and in union with other causes, from which they had not been completely separated. Repeated observation, however, has cleared up the difficulty. Bad food, bad water, and mineral effluvia are found not to be the causes of bilious fevers, but exhalations from putrefactive materials of a vegetable or an animal nature.

DIFFICULTY OF ASCERTAINING THE CAUSES OF MEDICAL PHENOMENA.

The invariable antecedence of the cause, and consequence of the effect, ascertained from many clear and decided observations, are then the principal circumstances to be regarded in determining their nature. These apply to the dead as well as to the living worlds: but as the complexity of the phenomena of the human system is greater than that of surrounding nature; since it consists of masses of organs, each operating

on the other, together, and on each other, for a specific purpose, the health and preservation of the whole, it is evident that in proportion to the number of these organs must be the variety produced in the phenomena presented by the causes which derange the system, and the danger of confusion in considering them.

In the sensible phenomena, which are considered by natural philosophy and chemistry, the case is widely different; if one body is propelled against another, immediate motion, if the power is sufficient, is the result; if one planet approaches another, they mutually move towards each other, and the effect is immediate, proportioned to their distance; if two chemical bodies which have an attraction for each other are put into the same menstruum, they act at once upon each other, and the phenomenon there ends.

In every respect, both with regard to the shortness of the time intervening between the cause and effect, as also with regard to the simplicity of the phenomena, which follow the action of causes, there is less obscurity in the inanimate, than in the living world. In health and disease, there is in the living body a regular series of changes, which follow each other in stages, each of which may present a vast variety of phenomena, whose varying features have not yet been recorded: thus, as in the healthy system, the periods of youth, maturity, and decline, succeed each other, each characterized by its appropriate susceptibilities; so in disease there is the same succession of stages: thus, in common inflammation, heat, pain, and redness, form the first; pus characterizes the second, ulceration the third, and the process of healing, the last stage; in the erysipelatous species, heat, pain, and redness, the secretion of water, and lastly, branny scales. In fevers generally, the cold, the hot, and the sweating stages, form the succession. In each of these, however, there is some variety; common inflammation may be arrested, and terminate in resolution, or instead of forming pus, it may end in scirrhus or in gangrene. Erysipelas, instead of being followed by blisters and scales, may also terminate in mortification. The causes of these deviations, however, can sometimes be appreciated; thus, a plethoric and irritable state of the system, may produce mortification, in an inflamed part, or the quantity of the poison absorbed may produce a fever in which a chill does not appear, the hot stage commencing the attack. The regular order, however, of almost every disease, is characterized by a commencement, maturity and decline, and this general feature appears to pervade all the operations of the system.

The causes operating on the human body also vary in the precision and degree of their results; at one time and in particular habits, producing slight, at others great and decided effects: whereas in the

phenomena of chemistry and natural philosophy, causes are exactly measured by their effects: thus, if a pound weight be placed at one end of a lever of a certain length, it will raise a certain weight at the other end, and its power is determined by known laws;* and if a certain body is to be saturated with an acid, the necessary quantity can be ascertained, and all difficulty is removed in any future manipulations, provided the purity of the ingredients be known. In the operations of the human system, however, this is not the case; thus, the quantity of the poison necessary to produce a bilious fever, is not known, though this disease, in certain climates, is very destructive; the degree of fever produced by it, or any mode of measuring that degree, is also unknown: the precise effect of certain states of the system, as plethora, which may increase the fever, are so likewise; that of others, which exist exterior to the body, is also unknown; as the influence of a high temperature in exhausting the system, &c. and producing a low or typhous disposition. To give another instance; the variolous matter inserted into the arm produces a pustule, a fever, pustules over the skin, and scabs, ending either in health or death. Some of the circumstances, which modify the fever are known; thus, a low diet previous to the inoculation, renders it mild; but the exact strength of the disease is not to be ascertained by any precise admeasurement, nor the precise effect of diet in abating it; its general course, and some of the circumstances that influence it, are ascertained, but the degree of this influence varies in different subjects, in a manner which our science gives no precise rule to determine or foretell; this difficulty arises partly from the little attention which has been paid to the discovery of tests, for the various and peculiar states of the system; and, secondly, to the inherent difficulty of the subject. It is a property of the living body to take on a violent reaction, on a slight cause at some times, at others to retain the regular tenor of health, under every variety of exposure; and this depends upon some secret cause within, known under the vague and uncertain epithet of predisposition or susceptibility to disease, which we have no test to measure or appreciate, except by the morbid result. Thus, a man exposed to the miasmata, which produce the fevers of hot climates, will continue in perfect health, though his system is loaded with the poison, till he is exposed to a sudden cause affecting either his body or his mind, as a shower of rain; the emotion produced by a frightful story, &c. From the calmest state of health, his disease, a violent fever, suddenly appears, and the tendency to death is rapid, unless counteracted by some powerful agent, as affusion of cold water, which sometimes suppresses the disease at once; or by the use of blood-letting, or tartar emetic, which pal-

* Parry's Posthumous Works.

liates and mitigates the fever, till it terminate in recovery or death. The cause here appears to be quite disproportionate to the reaction, a few drops of rain developing suddenly a most acute and destructive fever; it is also irregular, for this same cause may produce it in a slight degree in one subject, whilst in another, no diseased action is the result, though both have been equally exposed to the causes, which produce the fever. This difference is said to be owing to a variety in the predisposition to the disease, for which we have no certain measure or means to appreciate, except by the result.

In natural philosophy, astronomy, and chemistry, the case is different; there every thing may be weighed, numbered, and measured, and all the steps of cause and effect appreciated with the utmost precision. Till the same accuracy is obtained in medicine, an air of uncertainty must be thrown over the whole science.

The same difficulty occurs with regard to the proper appreciation of the effects of medicines upon the system; for the production and recovery from disease are regulated by the same principles. The system is a physical being, in which diseases are produced and removed by natural causes. Thus, if a medicine be given for the cure of a disease, from which the patient recovers immediately after the prescription, from the coincidence of the cause with the effect, the cure is attributed to the medicine.

But as the powers of restoration of the system, may produce this effect as well as the remedy, it requires repeated observation to determine exactly, to which of these causes the operation of the remedy is owing; and this is one of the essential requisites in appreciating the true power of every cause. The mere succession of the cure after the remedy is not sufficient: to give an instance; the triangular bone, a part of the human skull, was once given with confidence for the cure of epilepsy, and great efficacy was attributed to it, for a long series of years: at length, however, the phosphate of lime, of which this bone is principally composed, was determined to be entirely inert, and the virtue of the remedy was attributed to the horror, excited by the associations created by taking a medicine prepared from the dead body, and not to its physical qualities. It is upon this coincidence of recovery with the exhibition of medicines, that the impositions of empirical practitioners depend: thus the virtues of nostrums for the hydrophobia, obtain circulation and confidence from the circumstance that it does not always follow the bite of a rabid animal.

These cases, therefore, in which medicine is given before the disease appears, are often believed to be cured, when it would not have taken place.

MODE OF INVESTIGATING MEDICAL PHENOMENA.

The properties of the system, and the nature of the remedy are necessary to be known from repeated and frequent trials before any accurate decision can be drawn; and as the body exhibits a series of functions, all going on at the same time, acting simultaneously and in subordination to each other, liable to be deranged by many causes both without and within its limits, the study of the nature of cause and effect with regard to it, has always been difficult, and requires the most accurate and persevering scrutiny and zeal in its prosecutors.

As the restorative powers of the system are generally present, in persons taken suddenly sick from a state of health; and as the power of the remedy also acts at the same time, how can the efficacy of these two agents be determined? In three ways, first, by determining the natural course of the disease, and thus appreciating in every stage the effects of the unassisted efforts of the restorative powers of the system: If they are insufficient, the effect of any remedy may be then proven. Thus it is ascertained that the venereal disease runs a certain course; first sores appear upon the genitals, then swellings in the groin, followed after a certain time by eruptions on the skin, sores in the throat, pains in the bones, &c. These symptoms succeed each other with considerable regularity; and end in consumption, caries of the bones, and death, if not arrested by some remedy: Mercury succeeds generally in putting a stop to it; and other remedies, as guiacum, sarsaparilla, &c. assist; but without it the natural progress of the malady is slow and steady towards the destruction of the constitution. By its exhibition, the symptoms are arrested and the patient recovers. Other diseases, as hydrophobia, run their course; they are fatal; no remedy can arrest them. In both these cases, the natural progress of the disease exhibits a plain and uninterrupted course; in the one, the effect of medicine is plainly seen; in the other its inefficacy. Some diseases, on the contrary, invariably terminate, after running a particular course, in health; as the vaccine disease, the chicken pox, &c.

Secondly. By the immediate salutary effect of the remedy restoring at once the system, in increasing the restorative power, and also removing the morbid cause; thus suddenly restoring health to the system.

Thirdly. Where the restorative powers are in some instances sufficient for recovery, and in other cases they are not, the experience of the efficacy of a remedy in a vast number of instances determines its value: then the restorative powers become a vanishing quantity, and the excellence of the remedy is proved by the recovery of the system in many instances.

Thus, a celebrated general, during a dysentery, finding the number of his physicians too small, issued by their advice, a general order, that a certain quantity of Glauber salts should be administered to each soldier, at regular intervals: the army was accordingly soon freed from disease. Here the frequent deaths, and the sudden relief afforded by the medicine to thousands, removed all doubt with regard to its efficacy. During one of the campaigns of Austria in Hungary, the retinue of a certain count was entirely free from an intermittent which was general in the army, because bark was regularly administered to his followers: Here the number of the trials, and the continuance of the disease among thousands, who did not take the medicine, proved its efficacy. In the same campaign, the scurvy prevailed; mercury was exhibited, and death was the uniform consequence; as the disease raged extensively, it settled the noxious influence of the remedy beyond controversy.

REMARKS ON TWO OF SIR ISAAC NEWTON'S RULES OF PHILOSOPHY.

The rules laid down by Sir Isaac Newton, for the cultivation of natural philosophy, do not apply to the science of medicine, though often quoted with this view, viz. that similar effects proceed from the same or similar causes; and that we ought to admit of no other causes of natural effects, but such as are true, and sufficient to account for the phenomena.

With regard to the first rule, that similar effects proceed from the same or similar causes, it is only sufficient to examine the causes of any one disease, to show that it will not apply to medicine. Thus, the asthma arises from impure and smoky air, from a cold and foggy atmosphere, from the vapours of lead or arsenic, from frequent catarrhal attacks, from water in the chest, aneurisms, and other organic diseases. If, therefore, in every case of asthma, we inferred that its causes were the same, we should be much mistaken. The same thing may be said of all other diseases.

With regard to the second rule, that we ought to admit of no other causes, than such as are true and sufficient to explain the phenomena; the first part of the rule is gratuitous; a cause must be true, otherwise it is no cause at all. With regard to the second, the sufficiency of a cause to explain the phenomena, it wants precision, leaves too much to the mind, and opens an avenue to hypothesis. All the vagaries of medical theory, like the absurdities once advanced to explain the nature of gravitation, from the time of Hippocrates down to Broussais, have been believed to be sufficient to explain the phenomena, yet they have all proved unsatisfactory. Therefore, as the sufficiency of a cause to explain

the phenomena depends upon the fancy of the interpreter, it is idle to take it as a test of its truth.

To give an idea of the difficulty of investigating the causes of medical phenomena, the following remarks will be sufficient.

The same causes, apparently under the same circumstances, will have different effects; thus, a current of cold air blowing on the upper parts of the body, produces in the same system, croup, or palsy of the muscles of the face: the same cause, apparently under different circumstances, will produce the same effect; thus, miasmata develope in every variety of constitution, the intermittent fever; which, when epidemic, assumes the character of almost all diseases. Different causes, to all appearance under different circumstances, produce the same effect; apoplexy is the result of the heat of the sun, of high living, &c. proving that the subject requires the most patient and unwearied attention and research: for the qualities of the air, of food, exposure, predisposition, &c. all operate to give a distracted character to the face of medical opinion.

It therefore becomes necessary to view the phenomena of disease with a single, cautious, scrutinizing and unprejudiced eye; to trace, as far as can be done, every cause to its source, and to relieve the subject from embarrassing theories and hypotheses. From the limited nature of our powers, the phenomena are all we know; and it is the connection of two facts, in indissoluble and invariable succession, which constitutes the essence of causation, and it is the proper contemplation of this connection, which forms the real and solid acquisitions of science; for the whole operations of nature are nothing more than an uninterrupted series of phenomena in this relation. In tracing the union of a cause with its effect, the mind, from the constant observance of succession, invests the cause with a quality, called power, the result of an instinct, which nature has implanted in us, and it is to the proper estimate of this agent, to the assignment to every body, its proper degree of power, and to the faithful record for the good of others, of the effects it may produce, that men derive character in the pursuit of science, for accuracy of thought or the contrary; and it is also to the proper appreciation of the relative strength of the phenomena of nature, and the developement of our resources, according to that appreciation, that history stamps with the epithets of folly or of wisdom, of weakness or of strength, the various nations and ages of the world.

Though the history of the operation of medical causes is obscure, from their variety and their conflicting nature, yet by a proper examination of them, great triumphs have been achieved over the most dreadful maladies; and it is by observation, accurately appreciating the circumstances, on which the efficiency of remedies is decided, that the benefits

of our science are most conspicuous. Thus, for instance, with regard to the treatment by venesection of inflammatory diseases, the most common of all morbid affections: However hidden may be the seat of the inflammation—in the eye, the head, the lungs, if its symptoms be present, this plan of treatment effectually removes it, and prevents, when judiciously administered, the formation of abscesses, which almost always end in the destruction of the organ, and if the organ be necessary to life, in the death of the individual.

The removal of the inflammation is as indissolubly connected with venesection as its cause, as the extinction of the spark when it falls upon snow, or with an explosion when it falls upon gunpowder are with these substances respectively, and its operation is with equal difficulty explained: for the mind, in contemplating the abstraction of blood from the vessels, sees nothing more than the simple phenomenon and its effects, the debility and the removal of the disease, its consequent. Why the abstraction of the blood, should produce a diminished action of the heart, is equally inexplicable with the power of snow to extinguish the spark, or of gunpowder to produce an explosion, on the contact of that body. Reasoning from analogy, we should expect that the diminution of the quantity of blood in the vascular system, would lessen the mass to be propelled, and enable the heart to act with more vigour; but the contrary is the case; debility takes place long before a sufficient quantity is abstracted to lessen the mass of the blood, so as to aid its propulsion by diminishing its volume and weight. The phenomenon is purely vital; we see that it is followed by its effect, the removal of the disease, and this is all we know upon the subject. This naked manner of contemplating the operation of the causes, which affect the human body, produces great certainty, as it is continually the subject of observation, and experience will rectify its errors.

A cause, then, is merely a phenomenon, which is invariably antecedent and connected with another, as its consequent; and this connection is expressed by the word power, which is given to the antecedent phenomenon, from its invariable order of occurrence.

We shall now proceed to examine, in what hypothesis and theory consist, and attempt to show how far they are to be depended upon as the means of advancing our art.

ON HYPOTHESIS.

An hypothesis consists in the imagination of a cause which is supposed to intervene between the real cause, and that perceived by the senses.*

* See Brown's Lectures on the Human Mind.

When a person, after being exposed to marshy exhalation, is taken with an intermittent, he is first affected with a chill, in which the skin is corrugated on its whole surface. The marshy exhalation, and the constricted state of the skin, are the two first links of the chain of causes, which characterize fever, as perceived by the senses. Cullen, obeying the overweening propensity of the imagination, which attempts to satisfy itself by the invention of more satisfactory modes of explanation, attributed this state of the skin to a spasm of its fibres. Here then the hypothesis consists in the spasm, which intervenes between the miasmata and the chilly state, and which, though entirely fictitious, is said to be the cause of the latter. This hypothesis satisfied the celebrated professor and his pupils, till its novelty wore away, and the excitability of Dr. Brown, a more agreeable supposition, alike recommended by its novelty and unsubstantiated by fact, drove it from the field; the same may be said of almost every other medical hypothesis.

In Paris, there has arisen a new fancy, which fixes this imaginary being, intervening between the primary cause and the disease, in the intestines and stomach. Instead of the spasm of Cullen seated in the skin, and the excitability of Brown dispersed over the whole system, Broussais imagines the disease to consist of an inflamed state of the intestinal canal. As few persons die in the first attack of fever, it is difficult to prove the existence of this inflamed state of the lining membrane of this passage; and besides, appearances of inflammation occur without any other cause than the simple powers of the arteries, and therefore any proof drawn from this source must be equivocal. Yelloly found that persons who had died from hanging, exhibited the mucous membrane of the intestines in a high state of apparent inflammation. Dr. Seeds and Dr. Parrish, state that animals bled to death, exhibited the same appearances. As it has been found, too, in cases of death from other causes, it is certain that when discovered after fever, particularly a long time after the first cause has ceased to operate, it cannot be considered in any other light, than as an hypothesis. Dr. W. Phillips proved that the lungs and the stomach, were covered with injected vessels, in animals who died from dividing the par vagum. Mr. Brodie has shown, that arsenic applied to wounds, kills animals, and the stomach is found apparently inflamed, though no poison has been applied to it. These facts then show, that an inflamed state of the capillaries occurs from other causes, and in other situations; and that it can by no means be regarded as the result of the operation of miasmata, though it is found among the morbid phenomena, which are discovered after death. It might with more propriety be considered as a result, than as a cause of that class of diseases; though even this is problematical, since it is

discovered in subjects who have died suddenly from a state of the most perfect health. It is therefore only a concomitant of these affections, and must, when regarded as their cause, be considered as entirely hypothetical.

In chemistry, the same thing has frequently occurred. Previous to the time of the celebrated Lavoisier, the phenomena of combustion were explained by a principle called phlogiston; this process was believed to consist in the destruction of that principle, and till it was again renewed, the body remained incombustible: sulphur, for instance, during combustion lost its phlogiston, and became sulphuric acid: if this acid was again exposed to chemical operations, which restored the sulphur to its original form, it was then said to have regained its phlogiston, and be susceptible of a new combustion; this is a true example of an hypothesis; it is entirely an imagination, invented to explain a phenomenon, by the addition of a cause which has no existence. Its advocates, on finding that the burning body acquired weight during combustion—that the sulphuric acid was heavier than the sulphur consumed, were obliged to invent another hypothesis to render the principle of phlogiston tenable: they supposed that the phlogiston lost by the sulphur, during combustion, possessed a principle of levity, which by its loss during the combustion of the sulphur, rendered the body heavier, a supposition, which is explained very satisfactorily, by the increase of weight gained by the sulphuric acid: this hypothesis, like the former, had the same defect; it wanted the evidence of the senses, and as it kept the minds of the most illustrious chemists of the last century employed in its support or refutation, much labour was lost, which might have been better directed. The union of oxygen with the combustible body, presents a simple explanation of this phenomenon, which is supported by fact and demonstration to the senses, without the aid of any creation of the fancy.

This species of imagination is not, however, without its use. The mind, anxious in the support of truth, it has been said, is stimulated to inquiry, by the desire of substantiating the modes of accounting for phenomena, it may have invented. It therefore has a tendency to direct investigation to certain objects. It is, however, nothing more than the direction of an inefficient instrument to a limited range of natural observation; an instrument which from its inadequacy may be well compared to a telescope, whose glasses are obscured; when used to observe the appearances of the heavens, accident may with such assistance, make known some facts; experiment, with better appointed means, must eventually determine them.

The present state of chemistry, when pursued according to its purest principles, proves this truth. This science has arisen upon analysis, and

has owed its success to the maxim that all bodies must be considered as simple, till they are proved to be otherwise. It is a system of pure observation and inquiry, resting upon actual demonstration to the senses, without the admission of any hypothesis whatever.

In reading the book of nature, however successful our conjectures may be, it is as absurd to suppose a knowledge of her operations previous to examination, as it is to obtain a knowledge of the opinions of men, before we study them; and when we reflect upon the immense labour consumed previous to the age of experimental inquiry by adopting hypotheses as real interpretations of nature, the evils of this mode of inquiry will be properly appreciated: they constituted almost entirely the doctrines of the ancient philosophers on physical science, and in the present age, medicine abounds with these follies: to investigate nature is to observe facts, and to mark the indissoluble connections with each other, as cause and effect, and thus in the operations of life to give efficiency and power to every effort, whether in the arts of taste, of convenince, or necessity. The nature of an hypothesis, then, instead of simplifying, really multiplies causes, and envelopes in mystery the facts, of which true science consists.

ON THEORY.

Theory is not widely different:* it consists in the observation of a number of facts, noting the points, in which, the causes, which produce them agree, and characterizing in general terms their features of resemblance, and thus forming a principle, by the knowledge of which, their peculiar operation may in all circumstances be exactly known and determined. Thus, it is observed that, in animals, a daily supply of food is necessary for their health and strength; and this general fact is drawn from reiterated experience, and a wide circle of observation; but it is true, only within certain limits. If the position be confined to quadrupeds only, it is certain that considerable quantities of food taken daily, are found to be necessary for the perfect health of the animal. If we look into other classes of animals, as the amphibia, we find that the rattlesnake can live for many months without solid food of any kind, and grows fat; this circumstance again modifies the theory. Put the animal into the torpid state by cold, food becomes unnecessary for an undefined length of time; and the first position, that all animals require considerable quantites of fluid and solid food daily repeated, is again modified, and shewn not to be universal.

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* See Brown on the Philosophy of the Human Mind.

The act of generation is essential previous to the re-production of every individual; this is a general principle, which applies to quadrupeds, to birds, to the amphibia, and to fishes. It is not, however, universal; in some insects, two generations are re-produced without this operation, provided it be performed on the one preceding. In vegetables, the union of the sexes is not indispensable; the male and female exist on separate plants in the lombardy poplar* and weeping willow;† the female of the former, and the male of the latter, have never been brought to this country, and yet they are extensively propagated; this principle, then, is not at all universal.

In chemistry, Lavoisier, from observing that oxygen entered into the composition of many acids, supposed that it was essential to all, and it was, therefore, denominated the principle of acidification. It, however, forms acids, alkalies, and bodies possessed of the properties of neither—oxides and water. The theory, therefore, falls to the ground. Again, all bodies possess attraction, and the harmony of the solar system is explained on this general principle. By it, the exact position of each planet in its orbit, at any given period, past, present, or future, can be ascertained, and it is called the Newtonian theory. To conclude, however, that because the great masses of matter which roll through the sky obey this principle, that all others do, would be erroneous. Thus, a body thrown towards another, rebounds on approaching it within a certain distance; if glass be rubbed, light bodies are attracted and repelled by it; the position, therefore, that all bodies attract each other, is by no means general. Its precise limits can only be ascertained by observation, and it is upon this circumstance that the value of the theory of attraction rests. These remarks extend to all subjects of physical and medical inquiry. Emetics evacuate the contents of the stomach, and when given in small doses, also the intestines; and this is true of almost every article of the class, and constitutes one great and valuable property of these bodies in curing fever. To say that it is universal, however, is not at all true. The sulphate of copper is emetic and astringent; a fact which, in cases of diarrhœa, where an emetic is indicated, is of great use. Theory, then, is nothing more than the inference that a property is common to many individuals, and is only pernicious when it is extended to cases, in which no observation has been made, and which is not justified by the nature of things.

In the cultivation of science this observation is the great means by which all its truths are to be acquired. The mind and the senses are the instruments, by which it is effected: turned upon nature, whose

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* Populus dilatata. † Salix Babylonica.

phenomena united to each other in indissoluble union, present continued successions of cause and effect, they perform the office for which they are destined when they collect the facts as they are, and refer to their proper sources, the powers from which they flow: avoiding hypothetical or imaginary causes; or the error of extending too widely the operation of those which are real, or the other extreme of limiting their range within narrower limits, than observation will justify. The cultivation of science is then a matter of common sense; and the comparative success of different individuals, is decided by their strength and industry in pursuing it.

ON INVENTION.

To some superior minds, these powers have been so lavishly bestowed, as to dignify them with the distinguishing epithet of genius.

It is to genius, or the faculty of invention, that the greatest discoveries have been owing, and it is from the misapplication of this power that most of the errors of the world have originated.* The man who by great penetration invents the best means of accomplishing an end, when without his interference it would be impossible; who discovers in ordinary circumstances the seeds of useful improvement, which otherwise would have been neglected; who restores order out of confusion, whether in the moral or the physical world, when the best interests of his species are in jeopardy, is deservedly regarded as a superior being. This quality of mind principally depends for its success upon the cautious examination of the relation of cause and effect, and it is upon accurate discrimination amidst the irregularities of nature, and a reference of each phenomenon to its proper antecedent, that the man of genius achieves the wonders, which distinguish him. This, however, is a painful and laborious task. To examine with labour, to collate, to separate effects, and to connect them with their proper causes, is a task to which few are equal; whether the arrangement and formation of principles, or the more simple office of observation of individual causes, is the object. Genius, in its highest degree, requires a happy combination of judgment, memory, and imagination. If the former be predominant, whilst memory and imagination are deficient, the character is correct, though inactive, and phlegmatic; if memory, it is disposed to survey the labours of others, rather than invent and make improvements; if imagination, all its effects become more or less unreal and useless; and it is to this latter defect, that men of this class are most prone. Instead of collecting facts

* See Brown's Lectures on the Human Mind.

and arranging them, they have been too much disposed to fly from the field of labour, and to wander in the more delightful and seductive paths of fancy.

ON SOME OF THE SOURCES OF ERROR DISCOVERED IN THE HISTORY OF MEDICINE.

The science of medicine has now been cultivated for more than two thousand years. The most devoted industry, and the greatest talents have been exercised upon it; and though as in other branches of knowledge, there have been great improvements, and there is much to be remembered, yet upon no subject has the wild spirit and eccentric dispositions of the imagination been more widely displayed, than in the history of medicine. Like every other branch of science, it presents an extensive series of examples of the aberrations of the human mind, driving wildly over the surface of discovery: and as these aberrations are incidental to every individual in pursuit of truth, and as they affect the practical operations of life, it is important to point them out, in order that the prevailing errors of the day may be avoided, and its truths adopted.

I. The pride and vanity attendant on public stations and great celebrity, have contributed to augment the errors of science. Men of extensive fame glory in pretending to see deeper into the recesses of nature, than nature herself ever intended: they invent hypotheses, they build theories, and distort facts to suit these aerial creations. The celebrity of many of the most prominent characters of the last century, will, ere long, be discovered only in the libraries of the curious, and recollected only by the learned. Whilst the phenomena they pretended to explain continue in the same unvaried order, in the same beautiful succession, the fancies, with which their inventive imaginations have surrounded them, will be found to have disappeared with the fame, which gave circulation, and the authority, which enforced them on the easy minds of their respective ages.

II. The susceptible character of youth, in adopting the crude suggestions or ingenious follies of their teachers, leads also to error. It is necessary that authority should have weight; and it is the result of the limited range, within which attention is circumscribed by the multifarious occupations of life; the judicious and independent decide for themselves; the feeble and the flexible, borne down by the current of authority, adopt alike the truths and errors of the age, and become the saviours or the destroyers of their fellow men, according as chance may have cast their lot upon life's wayward stream. The modest and the humble, decide

with caution and deliberation, and their opinions are valuable; the arrogant and the self-sufficient are hasty, and they are dangerous. Truth is an object dear to every well regulated mind; vanity, the desire of superiority, or indolence, may conceal or destroy it; judgment, candor, industry, and zeal in enforcing, supporting and promulgating it, are qualities, which claim the respect, as they deserve the gratitude of mankind.

III. A more fruitful source of the errors of the scientific world, is derived from that disposition, which induces explanations of the phenomena of nature, by principles drawn from subjects with which the mind is more familiar. This mode of philosophy has been of extensive evil in medicine. During the prevalence of the mechanical, chemical, and mathematical systems of philosophy, all the changes of the body were referred to them: the doctrines of Keil, Paracelsus, and Borelli, who attempted to explain the phenomena of life by the sciences with which they were most conversant, still remain conspicuous instances of this error. During the prevalence of chemistry in the age of Louis the XIV. vast labour was bestowed in analysing vegetable remedies, from the belief that the diseases of the human body were produced by an acid or an alkali, which was supposed to pervade the system, and that it was necessary to discover which of these principles every remedy possessed. This folly was relinquished, after finding that the most noxious and the most innocent substances were composed of the same ultimate materials; that the poison of the viper and gum arabic owed their qualities to a various disposition of the same elementary substances. It is no later than the conclusion of the last century, that the most enlightened physicians explained many of the phenomena of life, on the supposition of the presence of too large a quantity of oxygen in the system: the late revival of the use of the magnet in the cure of tic doloureux, rheumatism, &c. by some of the most able physicians of Europe may, with propriety, be referred to the same disposition of mind to be directed and biassed in its pursuits, by the fashions of science. Other branches of knowledge obey the same influence.

Metaphysicians still speak of impressions, as if our thoughts were the result of impulses, or our ideas of images reflected from a glass. Indeed, so prevalent is this source of error, that it is almost impossible to divest ourselves of its influence. Electricity has been introduced to explain the phenomena of the system, and was once extensively employed in removing its diseases; and galvanism, now a more conspicuous object of attention, fills the same office in the present philosophy of the nervous system.

IV. The disposition to simplify the causes of nature, has had an

equally extensive effect. The excitability of Dr. Brown explained, without difficulty, all the phenomena of the body: the pain which was produced by a red hot iron, and the pleasurable sensation excited by the softest substance, the irregular and terrible symptoms of the hydrophobia, and the sensations of perfect health, were all expressions of the various states of the same power, which under the bold and hardy invention of this innovator in medicine, explained all the phenomena of our complicated system, from the greatest to the least.

The four elements, earth, air, water, and fire, to which every thing was resolved by the chemists, illustrate the same defect. The properties of medicines, in fact, of all bodies, were once believed to be reducible to four; to heat, to cold, to moisture, and to dryness; and from hence arose the temperaments, the bilious, the phlegmatic, the sanguine, and the melancholic, a division which, though it prevails to this day, is as groundless as the qualities, upon which it originated. This disposition to simplification, however, is only defective when in excess, and conducted by hypothesis, and not by observation and experiment. The theory of gravitation, embracing in the wide compass of a single principle, all the phenomena of the ocean, the air, and the land, the planets and the comets of our system, exhibits a splendid result of this faculty. The variety, the beauty, the order of this vast sea of effects, the result of only one quality of matter, whilst it enlarges our ideas of the Creator of the universe, gives a happy illustration of the proper application of this mental propensity—the proper arrangement of facts under their proper causes, by the faculty of generalization.

But if, extending this great principle beyond its proper limits, we venture to embrace in it the phenomena of the attractions of affinity and of aggregation, of electricity and magnetism, it is found to be inadequate, and we fall into error. There is great simplicity in the works of nature; they are united and moved upon one great plan, but placed as we are without the curtain, we can only discover by the observation of the phenomena, how far the operation of a principle extends, and to attempt to simplify farther, leads to erroneous conclusions. It is to this love of simplicity, that mankind owe the attempts of empirics to effect cures by medicines, which unite in the compass of a single substance the power of relieving all diseases. The mystery, in which they are enveloped stimulates curiosity, and the patient pays largely to the pretender for his health, whilst nature performs the cure. It is to the same mysterious pretension, that boastingly promises to relieve hydrophobia, cancer, and other diseases beyond the power of our art, that the success of this species of imposture is owing.

It is said that mystery of explanation, as it entices youth to study, has a highly beneficial effect. That it has great power over the mind, is clearly proved from the fascination it throws around the modern tales of fiction; from the great effect it gives to the character of freemasonry, an institution which has been of extensive benefit, and under the direction of bad principles has done much mischief in the world. The same cause increased the celebrity, influence, and effect of the elegant letters of Junius, which kept in a state of alarm the jealousy of British liberty; and the story of the man in the iron mask, on the same principle, gave interest to an incident little more important to mankind than an idle Arabian tale.

v. The errors produced by one extreme, induce mankind to embrace the contrary. In the early ages of every science, occult qualities claim great attention. Among savages, every phenomenon of nature is supposed to be produced by spirits, which have their residence in the bodies, which they move. As philosophy advances, these imaginary creations are rejected, and every thing is supposed to be the result of natural causes; and thus from the extreme of superstition, they pass into atheism.

vi. The effect of superstition appeared extensively in the first application of chemistry to the materia medica. The influence of the planets, alchemy, animal magnetism, the discovery of panaceas, and of medicines capable of prolonging life, are enumerated among the follies of that era.

vii. The doctrine of signatures, which ascribed virtues to remedies drawn either from the figure or the colour of the plants, from which they were taken, had an extensive sway, and it is only within the last seventy years, that it has been banished from the elementary books of the most respectable schools of Europe.

viii. All the phenomena of the natural world were explained by Des Cartes by matter and motion, a doctrine, which followed that of occult qualities, which his predecessors supposed to be the active powers of the physical world. The influence of this system was extensive upon our science at one period. The action of medicines was explained upon the principle that the corpuscles of bodies operated upon each other by their figure, size, and density; so wide spread and lasting was this error, propagated principally by the influence of the great Boerhaave, that a celebrated writer as late as the conclusion of the last century, explained the operation of mercury by its specific gravity.

ix. The accurate descriptions of disease, and the examination of remedies, by Boerhaave and Cullen, gave way, for a time, to the specious

doctrine of stimulation of Brown, who believed in only one species of remedy and two forms of disease: the science thus vibrated between a complication of remedies, in the time of Boerhaave too complex, and in that of Brown too simple.

This disposition to pursue extremes, applies particularly to the adoption of new remedies. When a medicine has been too much extolled, opinion weakened by habit, and by the current of fashion directed to other remedies, at length discards it altogether: Mercury, in the cure of syphilis, long balanced between excessive and blind partiality, and utter rejection; at length, after sarsaparilla, nitric acid, opium, guaiacum, which at various periods had adopted its place, had been fairly tried and abandoned, it was again reinstated. At present, in England, it suffers a temporary defection in public opinion; and though no substitute has been proposed, there can be little doubt, that at least the constitutional symptoms of that terrible disease must be ultimately cured only by this remedy, for it is satisfactorily proved, in small doses, to afford the best relief in those chronic inflammations, and ulcers produced by its improper exhibition.

x. The passions of physicians have proved of essential detriment to the advancement of their art. This point is so evident, that it hardly requires discussion. The disputes betwen the followers of the Grecian and the Arabian physicians, occupied a great part of the sixteenth century; those of the followers of Galen and Paracelsus were equally warm, and equally futile, leaving the science comparatively little cultivated, when the works which are the result of their labours are considered. The faculty of Paris, under the dominion of Galenical medicine, published a decree against the use of antimony, which was rescinded only as late as the year 1666; a proof of the folly, as well as the pernicious effects, which attend the operation of disputes in medicine as well as those of religion, when inflamed by opposition. The prejudice in favour of particular remedies produced by fashion, gives a temporary excitement to the medical mind, which in most instances is excessive. The influence of the celebrated Stork of Vienna, introduced narcotics in the cure of scirrhus, a prejudice which occupies, in cancer of the womb, considerable, though undeserved attention to this day. The weight and respectability of men acquainted with medicine, incautiously given in favour of particular remedies, has had much influence in exciting the prejudices of physicians. The celebrated Mr. Boyle made a considerable collection of remedies of supposed experienced virtues, which for a time claimed attention, with but little improvement to the science; the powder of the duke of Portland, used in gout, will long remain a fatal instance of the credulity of our science, excited by a great name. The

eau medicinale d'Husson, more lately, may be placed under the same head.

XI. The errors, which arise out of the use of improper language, are equally extensive. It is evident, in a science which professes to treat of phenomena so concealed, and with difficulty measured, as those of the human system, that its descriptions must be general, vague, and unsatisfactory, without a language rigorous, precise, and properly adapted to its varying modifications and changes: the different kinds of pain, the nameless combinations of symptoms exhibited in the same disease; the appearances of the tongue; the various states of the pulse and of the secretions, are all important to designate the precise state of the system, and have, in our present medical language, very imperfect expressions.

The perfection then of every science consists in the exact assignment of effects to their causes, and the expression of their operation, in intelligible language. The process is simple, and observation is the great means of its accomplishment.

In order to appreciate exactly the difference between the medical character of the United States, and that of Europe, it is proper to take a review of our climate, manner of living, and diseases.

ON THE CLIMATE, MANNER OF LIVING, AND DISEASES OF THE UNITED STATES.

This country stretches from the 30th to the 47th degree of north latitude, and embraces a vast diversity of climate and of soil;—exhibiting the animal and the vegetable kingdoms, in all their variety; and as the human frame is, in its various portions, exposed to almost every species of temperature and treatment, there can hardly be named a single disease which does not exist in the United States.* As they are flanked on one side by an impenetrable forest, and have an ocean equally extensive on the other, the comparatively narrow tract which they embrace is subject to the dominion of the winds produced by these two great natural magazines. Our seasons are accordingly in perpetual variation; though, at the same time, the cold predominates in the north, and the hot in the south;—while those of the middle states are constantly vibrating from the one to the other. Nothing, in short, can exceed the variableness of our climate; for we can truly say with the Spectator, that we frequently 'lie down in July, and rise in December.'

* This Essay was originally published in the Analectic Magazine, by the author of this discourse.

In Pennsylvania, there are seldom more than thirty or forty days of summer or of winter, in which the mercury rises above eighty, or sinks below thirty degrees of Fahrenheit's thermometer. The winter generally commences about Christmas, and continues till the beginning of March: April is raw and often showery; May still retains the moderate coolness of spring; June introduces summer; July and August are the hottest months; but in the latter the mornings and evenings begin to be cool, and in September the days are pleasant and delightful. The season is then generally the most equable, and the country the most attractive. The trees are variegated with foliage of a great variety of colours; and instead of the sombre and melancholy drapery of European forests, they have a gay and enchanting appearance.*

In summer we have days which are uncomfortable without fire, and in winter some which are disagreeable with it. Garlic, a vegetable which is common in the eastern parts of the states, has appeared in January; other plants have blossomed in December and in February; and yet in the very same months the thermometer has sunk as low as twenty-two degrees below 0. The autumn and spring exhibit all these varieties; more particularly the latter; which is still affected by the contests of the sun, growing every day more powerful, with the northern and western winds sweeping across the vast surface of the continent, between the United States and the Pacific ocean. Pennsylvania exhibits in the spring the moisture of the British isles; the heats of the tropical countries, in the summer; the sky of Barbary in the autumn; and the atmosphere of Russia in the winter. There is no month in which frost has not made its appearance, or in which fires have not been found necessary.† Taking the climate of Pennsylvania, then, as our point of observation, we see a vast continent, surrounded on the north and west by extensive forests, stretching their almost immeasurable bounds to an ocean many thousand miles distant, and experiencing in its extent the cold of the arctic circle, the moderation of the middle latidudes, and the heat of the torrid zone; on the south a burning country, moderated and broken by huge mountains, and on the east by an ocean equally extensive as the forest on the west, and equally fruitful in storms and variable seasons. The consequence which naturally attends our position between these two great natural deserts, is, as was before observed, that unceasing changes are taking place in our climate. The north differs from the south in having a surface more vexed by winds,—though cold predominates; the middle vibrates alternately to both extremes; while the south is more under the genial influence of the sun.

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* Rush's Works. † Ibid.

As the western districts of the country are divided by great mountains, they have in general a milder temperature than the eastern. The effects of the winds upon health are pretty accurately measured by the following arrangement: as the north and north-west are rendered severe in winter by passing over interminable snows,—but moderated and moistened in summer by accompanying rains, they in winter invigorate, and in summer refresh the inhabitants of the states and territories which lie east of the Mississippi. Proceeding to the south, the winds traversing the ocean in that direction, Mexico and the south-western states, lose some of their moisture, and have a still more debilitating effect; which increases as we proceed towards the east, till we come to that quarter where cold and moisture both combine to affect the wind in the highest degree. We find few men above forty who are not susceptible of its chilling and depressing effects. The cold and dry air of the north latitudes, the moist and relaxing breezes of the south and west, the chilly raw currents from the eastward form, in general, then, the character of the winds which disturb and perplex our climates.

Our mode of living, with regard to dress and diet nearly resembles that of our English brethren. Coffee, bread, meat, and butter, constitute our breakfast; the domestic animals and vegetables which are eaten by the Europeans, furnish our dinner; whilst the third and the last meal generally consists of tea and bread, with perhaps a little animal food. Our drinks are also nearly the same; the native liquor distilled from rye, constituting the beverage of the labourer; brandy, gin, spirits and Madeira wine, that of the higher classes. We differ from our ancestors, however, in eating more animal food, and drinking more spirituous liquors; though, as to the latter article, perhaps, it may safely be said, that the consumption of these destructive and pernicious stimulants increases by degrees as we go from the north to the south. In the eastern states, the people are thrifty, active, and industrious,—drinking little ardent liquor of any kind: but as we approach the middle states this vice augments, whilst industry necessarily decreases; and when we come to the southern districts we see intemperance prostrating her victims on every side, and bringing along with her the usual train of lazy habits and dissolute morals. If we have any vice which can be called national, it is *intemperance:* The quantity of liquors consumed yearly is prodigious.

With regard to our diseases, pleurisies, rheumatisms, and inflammations generally prevail during the winter in the northern states. Catarrh, too, is common, and often terminates in the consumption; which may be called the endemic of the country. In some districts and seasons, one fourth of the number of deaths are from this cause. The various forms

of quinsy occur frequently; nor are local inflammations of the internal parts of the body by any means uncommon. The eruptive diseases,—such as the scarlet fever, the measles, &c. occur generally at the interval of three, four, or more years:—but the small-pox, since the introduction of the vaccine, has certainly been suppressed as far as the irregularities of poverty, ignorance, and prejudice will permit. It is a lamentable truth, however, that this loathsome disease is still seen in our cities. The plague, exactly in the form which it wears in the old world, has seldom appeared in our country. The disease of Pemphigus, and miliary fever, are not often seen. Apthæ and cholera, particularly among young children, appear in the summer, when the heats are great. The nettle rash is common among the adolescent,—but more rare in adults. Hæmorrhages, both active and passive, are known in all climates of the country, and cannot perhaps be said to belong to one district more than to another,—excepting that from the lungs; which is not uncommon in the northern districts, and most generally precedes the consumption. In the southernmost regions it is almost unknown. Hæmorrhoids are often an affection of the old; and perhaps, indeed, it may be said that, with respect to this disease, as well as to others, not immediately connected with our variable climate, we resemble the inhabitants of Europe. With regard to the diseases peculiar to the sex the same remark may be made.

Apoplexy and palsy are often the result of intemperate habits; in the middle and southern states particularly. They are the diseases of which the aged die, in the concluding months of winter, as well as at the beginning of spring or of autumn. The active habits of our countrymen render hypochondria more rare than in Great Britain. In the northern states the tetanus or lockjaw, is uncommon, in summer, and never occurs in winter. In the middle states, it is dangerous to receive a wound, particularly a lacerated one, during the warm season, without using stimulating remedies to prevent this dreadful disease. In the southern, it is not at all infrequent in summer, and it sometimes occurs even in winter. In the former seasons it often proceeds from a cause, viz. exposure to the night air, which in the northern states is seldom or never known to produce it. Of epilepsy, asthma, and St. Vitus's dance, there is nothing peculiar to be said with regard to our country. Pyrosis and indigestion, are often the result of intemperance: they are confined to no particular district, or tract; and may be said to attack in the common forms and from the ordinary causes. Hydrophobia appears not unfrequently; and is often symptomatic,—though it most commonly arises from the bite of rabid animals. Madness, indeed, may be supposed to arise in this country from the same occasional causes, as in Europe. It appears in families,

and descends by hereditary succession; often disappearing in one branch, or generation, and making its appearance again in another. Sometimes high-toned pride, intemperance, excessive headachs or eccentricity, in a parent, becomes mania in the next generation; while on the contrary, they leave a family in a reverse order. Religion, love, and losses in business, may perhaps be the most frequent causes of this disease, though from its connection with hereditary perdisposition, it is often difficult to trace them with accuracy.

Dropsy is believed to be less common, than formerly, and is now a very manageable disease, where the constitution is not absolutely broken. It generally occurs among the poor, the irregular, and the intemperate. Rickets rarely appears; though it sometimes affects the negroes, and particularly negro children. Scrofula occurs more frequently; and is generally manifested in diseased mesenteric glandular swellings, and ulcers of the soft parts, with carious bone. With regard to the disease resulting from impure connexion, it may be supposed, that, in a country, where population is extended on a scale unknown in any other quarter of the globe,—where all the delights of life highly stimulate the system, the diseases of a function so intimately connected with the general health would naturally be common. Accordingly, it may be said, that among the labouring classes, particularly in the cities, there are few individuals, who have not had their constitutions seriously affected by frequent contaminations, by injudicious exhibitions of mercury, or by suffering the malady to go imperfectly cured or totally neglected. To give the reader a general view of the state of disease in our country we would say, that malignant bilious fevers of remittent or an intermittent type, prevail most in the summer and beginning of autumn; catarrhs, pleurisies, inflammations, rheumatisms, typhous fevers, in the approach and progress of winter, as well as in the commencement of spring,—and that the other diseases, which have been enumerated, are regulated in their appearance by irregularity of living, by the decay of nature, and by the other numerous and varying accidents of life and of climate. Accordingly in the north, where winter has the sway, the remittent fevers of the summer are more mild, and the inflammations more severe. But in the south, the contrary takes place,—the fevers being malignant and deadly; whilst inflammations, pleurisies, catarrhs, and consumptions, seldom occur or are entirely unknown. In the middle states, on the other hand, where the climate is alternately tropical and arctic, we have, according as the one or the other season prevails, the malignant fevers of the south,—or the consumptions, and the inflammations of the north. From this view of the climate and diseases of our country, it need not be said, that various districts have various degrees of health; that the sea, lakes, marshes, high-

lands, and mountainous regions diversify the temperature of the air, as well as the character of disease; that epidemics appear in districts, for many years blessed with health; and that while there are endemics, which never leave particular regions,—there are others which, at all seasons and in all years are comparatively free from diseases of any kind.

PART I.

ACUTE DISEASES.

CLASS I. FEVERS.

CHAP. I.

GENERAL DOCTRINE OF FEVER.

Importance of the Subject—Fever how characterized—Of Rigors and Heat of Skin—Frequency of Pulse—Loss of Muscular Power—Disturbance in the Functions of the Stomach—Other Functions disturbed in Fever—Leading Divisions of Febrile Diseases—Causes of Fever, predisposing and occasional—Nature of Fever—Periodic movements observable in Fever—Principles of the Treatment of Fever.

IMPORTANCE OF THE SUBJECT.

Fever is the most important, because the most universal and the most fatal of all the morbid affections of which the human body is susceptible. Its presence characterizes a great number of diseases; and in others which are not for the most part attended by it, the Physician must always be prepared to expect its occurrence. It is *that*, by the presence or absence of which all his views of treatment are to be regulated; whose rise, progress, and termination, he always watches with the closest attention, and by the degree of which, he is enabled, in a great measure, to estimate the danger in each particular case. Some idea may be formed of the great mortality of fevers from the statement of Sydenham, who calculated that two-thirds of mankind die of acute diseases properly so called, and two-thirds of the remainder, of that lingering febrile disease, consumption. Fever has proved a fertile theme, on which the ingenuity of physicians, in all ages, has been exerted; and a glance at the attention which it has received from every medical author, both ancient and modern, would be sufficient to impress upon any one the importance of the doctrines it embraces. How *difficult*, lastly, is the study of fever may be inferred from this, that though so much has been written concerning it, there is no one subject in the whole circle of medical science which still involves so many

disputed points. In every view the doctrines of fever must be considered of paramount importance, and they constitute, therefore, with great propriety, the foundation of all pathological reasoning.

FEVER HOW CHARACTERIZED.

When a person is suddenly attacked by shiverings or rigors, followed by a hot skin, a quick pulse, and a feeling of languor and lassitude, he is said to have an attack of fever. With such symptoms are usually present also a loss of appetite, and thirst; restlessness, and diminished secretion. These constitute the six leading symptoms of fever, the characteristic features by which its presence may always be detected. Every function of the body indeed is more or less disturbed, but we select for the *definition of fever* those which are of the most importance in the animal economy. The marks of disturbance in them afford the *characters* of fever just enumerated, and of which we now propose to treat in detail.

RIGORS AND HEAT OF SKIN.

1. Chilliness, succeeded by increased heat of skin, is the first and leading feature of fever. The chilliness or rigor is sometimes so slight as almost to escape the notice of the patient. At other times it is exceedingly violent, so that he complains bitterly of cold. His teeth chatter. His limbs tremble. The skin is pale, rough, and contracted. The features shrink. A sensation is felt as of cold water trickling down the back.

In some instances it has been so violent that the patient has gone into convulsions; in others some of the teeth have been knocked out: also, syncope, death-like rigidity of the limbs have occurred; and after the fit the power of motion has been almost lost: sometimes the cold is partial, affecting one part of the body; sometimes it is external only.*

Though the author mentions, that chilliness is the first symptom of fever, it is so only in its simpler forms, for there are many cases in which it does not occur at all, and when it does, it is often preceded by languor, weariness, yawning and stretching,† with great weakness and restlessness, and a slow and small pulse.

The prominent characteristic of this stage is a weakness of the heart and arteries, as is shewn in the weakness, frequency, and irregularity of the pulse; the consequent shrinking of the extremities, as of the fingers, and also of tumors; the suspension of the discharge from sores; the coldness and want of sensibility of the feet or hands; horripilation, or a feeling as if insects were creeping over the hairs on the surface; a wrinkled and shrivelled state of the skin also accompanies it. Pain in the head, back, and limbs, is also one of the first symptoms of fever. The respiration is more hurried and anxious, with a sense of weight, and often of tightness, about the chest; cough, sighing, and dejection of spirits.‡ The senses are more or less impaired during this stage; the mind also is weakened, it is impossible to keep up the attention to any one subject; agreeable thoughts become disagreeable, and delirium often comes on as the chill advances; the appetite, particularly for animal food, tobacco, and all stimulants, is lost; bile is secreted in great quanti-

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* Philip, p. 54, on Feb. Dis. Lond. 1813. † Ibid, p. 55.
‡ Ibid, p. 56.

ties in the last moments of the chill, and the patient becomes sick, nauseated, and vomits it pure; sometimes a ropy transparent fluid is discharged, the bile being then carried off by the intestines. The urine during the cold stage is clear and colourless, without cloud or sediment.* C.

The duration of the cold stage varies from an hour to two or even three days. Though often very slight, it is perhaps never entirely wanting; and is at all times to be carefully inquired for and noted by the physician, as marking the precise period of the accession of fever. This it is useful to know in all febrile diseases; but in some, as small-pox and measles, it forms the basis of our prognosis. The coldness of which the patient complains, is sometimes, though not always, perceptible to the touch of another, but never to the extent that might have been anticipated from the sufferings and expressions of the patient.

When the remote cause inflicts a deep wound upon the nervous system, the patient sometimes dies in the chill—sometimes in the first, though more frequently in the second or third paroxysm. In such cases the increased heat and action in the extreme vessels are never developed: hence it is generally to be observed, that the shortest chills are succeeded by the most inflammatory fevers, and vice versa. If the disease be well managed, it may be conducted to a safe issue, with a facility in the exact ratio of the degree of fever. The duration of the chill *for* "*two or three days,*" is not a frequent occurrence, where medical aid is opportunely and judiciously administered. If the inflammatory symptoms run high, it is effectually destroyed by blood-letting and the auxiliary antiphlogistic means: if the fever assume a low type, emetics, catharties or tonics, agreeably to indications, remove it, unless some organ highly essential to life shall have been too deeply involved. P.

By degrees the chilliness subsides, and begins to alternate with warm flushings. A heat of skin greater than natural succeeds, and with it returns the colour of the skin. The cheeks become even flushed, and the eyes suffused. The features recover their usual size, or appear more turgid than in health. The hot stage of fever is then said to be formed, which may go off in a few hours, as in the case of an ague, or may continue for days or weeks, as in common *continued* fever.

The heat often rises to 105° Fahrenheit; the breathing becomes deeper, less anxious, slower, and more free, the sense of tightness gradually declining; the sensibility is increased; the pains of the head, back, and limbs continue; light, noises, and bustling motion in the room, are painful; delirium, or confusion of thought, takes the place of the stupor of the chill, as the pulse increases in strength: the urine becomes high coloured and without sediment: Whilst the pulse runs high, hæmorrhages from the nose, womb, ears, lungs, and from piles, if the patient be subject to them, are not uncommon; and under these circumstances in inflammatory fevers, are generally favourable. Tumors, and the general fulness of the body increase as the hot fit goes on, till the sweating stage appears: After the hot stage has continued for some time, the sweating commences generally on the upper parts of the body, the respiration becoming easy, free, and natural, the pulse abating, and the urine depositing a lateritious, or brickdust coloured, and often a whitish sendiment; the patient feeling weak or exhausted, after the sweat has continued some time:

These symptoms occur in the common intermittent, and characterize more or less all fevers, with some irregularity: thus, as was before observed, the cold stage is

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* Cullen.

often wanting; and sometimes the hot stage, a cold and clammy sweat commencing the attack; or the hot and sweating stages go on simultaneously, the chill being omitted; indeed cases are recorded, in which the cold, the hot and sweating stages were completely reversed: The symptoms of fever often personate those of all other diseases, as pleurisy, rheumatism, phrenzy, epilepsy, apoplexy, hydrophobia, hysteria, gravel, in fact every morbid affection whether acute or chronic to which the system is subject, and even health itself till the last fatal struggle of the system betrays the lurking and mortal enemy within: sometimes the fits personate different diseases at different attacks; thus epilepsy in one, pleurisy in the next; at other times the fever is subdued, and intermittent affections; as amaurosis, headache, toothache take its place: all these irregularities disappear by the treatment proper to the fever* as it prevails at that particular season, with some respect to the symptoms for the purpose of palliation which appear in particular vital parts, when the violence of the action threatens to destroy life before the remedies, as the bark, &c. which prevent the fit can be given. C.

FREQUENCY OF PULSE.

2. The second great feature denoting the presence of fever, is an increase in the frequency of the pulse. This is one of the earliest and most constant of all the symptoms of fever, and perhaps would scarcely ever be wanting, but for some accidental circumstance, such as a congestion of the blood in the vessels of the brain. The feverish pulse of an adult varies in point of frequency, from the slightest increase above the natural standard, to that point at which it can with difficulty be numbered.† In forming any judgment of diseases by the frequency of the pulse, great allowance must always be made for the age of the patient,—for sex, constitution, and temperament of body, for the kind and period of the disease,—for external circumstances; such, for instance, as the state of the air surrounding the patient, and the irritations to which he is exposed,—lastly, for the effect of diet and medicines, and even in some circumstances the position of the body. The pulse of fever differs from that of health in other points, besides that of comparative frequency. These characters of the febrile pulse are distinguished by the terms hardness, wiriness, fulness, softness, and weakness; but as they are not essential to the existence of fever, they will more properly come under consideration hereafter.

The greater part of our therapeutic views drawn from this source, can only be learned by a long and attentive habit of feeling pulses. The sensation imparted to the fingers from the pulsation of an artery, is simple and cannot be well defined. For some of these sensations, we give names that serve as general marks of discrimination, but for many of them we want language to express the impressions made on our fingers. The epithets hard, soft, frequent, quick, slow, full, large, small, weak, strong, regular, irregular, and some others, are so many self-evident qualities or conditions of the state of the circulation; but the varieties and shades

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* Philip, 61—6.

† For practical purposes it may be advisable for the student to make some rude divisions of feverish pulses. The first may have 84 in a minute for its average, and may range between the natural standard and 90. The second may have 100 for its average, and its range will be from 90 to 110. The third 120, ranging between 110 and 132. The last, which I would call the *rapid* pulse, has 144 for its average. It is the kind of pulse which is familiar to all in the last stages of *hectic* fever.

of every one of them are so numerous, that the tactus eruditus of experience may divide them almost ad infinitum. The *frequency* of the pulse is of less importance in practice than its hardness, because death is occasioned generally by organic injury, and not often by simple irritation or debility. It may be remarked with respect to the *slowness* of the pulse, that it may be occasioned by other causes beside cerebral congestion; probably by direct sympathy between the stomach and heart; such as the presence of worms in the stomach. By certain indigestible articles of diet acting on its nerves, and frequently by medicine, the effect of which has been received as an indication of a diseased condition of the brain. The long continued employment of calomel. The use of antimonials, and the action of digitalis, are among the examples of slow pulses arising from impressions made directly on the stomach. P.

Of these leading characters of fever, rigor succeeded by heat of skin, and increased frequency of pulse, it is curious to observe what different judgments have been formed. The bulk of mankind have almost uniformly and by common consent, laid the greatest stress upon the increased heat of the body, and accordingly all the expressions for *fever* in different languages are derived from the words signifying heat or fire. This was for a long time the doctrine of the schools, Galen having taught that the essence of fever was in *præternatural heat.* Boerhaave, who investigated the phenomena of fever with great accuracy, and acknowledged the importance of these leading symptoms, yet imagined that the quickened pulse was the single *essential* symptom of fever, uniformly present from the beginning to the end of the disease, and by which the physician judges of its presence and degree. Dr. Cullen, on the other hand, placed the rigor and shivering in the first rank of febrile symptoms. He imagined that as the hot stage of fever is so constantly preceded by the cold stage, the one was *caused* by the other, and the cause of the cold stage, therefore, was the cause of all that followed in the course of the paroxysm. These opinions we may be allowed to consider as upon a par in point of relative merit. They may all be supported by specious arguments, but we must end by confessing, that fever does not consist in *this*, or *that* symptom, but in the co-existence and succession of many.

LOSS OF MUSCULAR POWER.

3. Among the various evidences of the presence of fever, the loss of muscular power was noticed, marked by the occurrence of languor and lassitude, a sensation of fatigue, and great pain referred to the muscles and joints, particularly of the back and limbs. This striking index of fever was elegantly illustrated by Boerhaave, under the title of *Debilitas febrilis.* It is to be distinguished from that weakness of the muscles, which arises from great exertion, the privation of nourishment, or the violence, or long continuance of an evacuation. It is present in a greater or less degree in all fevers, though it bears no proportion to the violence or danger of the disease. It is aggravated by the slightest exertions of muscular power, and in severe cases is but partially relieved by the horizontal posture.

DISTURBANCES IN THE FUNCTIONS OF THE STOMACH, &c.

4. Disturbances in the functions of animal heat, circulation, and muscular motion, afford then the most prominent marks of fever; but every other function of the body, animal, vital, and natural, is more or less deranged, and that of the stomach in so remarkable a degree, as to demand particular notice. *Loss of appetite, nausea, and vomiting*, are very common symptoms of fever, but they are of secondary importance, both because fever frequently subsists without them, and they without fever. Connected with the loss of appetite, we may mention the symptom of *thirst*, one of the most familiar of all the characters of fever, and yet one more frequently wanting than any other. The desire is almost invariably for cold drink, and doubtless this is a beautiful provision of nature. There is no ground for believing with Asclepiades, and the followers of his school, that any danger is to be apprehended from the indulgence of this appetite.

The *restlessness and want of sleep* which occur in febrile diseases are characteristic symptoms which deserve notice. They are seldom wanting in the early stages of fever, and are peculiarly distressing to the patient, often continuing during the whole course of a long fever. The return of sleep is one of the surest indications of its decline.

Nothing more strikingly characterizes the presence of fever, than a general diminution and depraved state of the secretions all over the body. This is exemplified in the dryness and clamminess of the mouth, and the white and furred tongue, which are so frequently observed in all febrile diseases. The skin is dry and parched from the cessation of cuticular transpiration. The urine is scanty and high coloured. The bowels are generally constipated. The evacuations which may be procured are for the most part dark and fœtid. These and several other phenomena of fever are referable to the important general principle now laid down.

LEADING DIVISIONS OF FEBRILE DISEASES.

Having thus explained the characters of *pyrexia*, it will be proper to inquire, what are the leading divisions of febrile diseases, and to point out generally, what are the chief predisposing and *occasional* (or exciting) causes of fever.

A very superficial observation of nature is sufficient to point out the first distinction among febrile diseases, I mean that into *Idiopathic* and *Symptomatic*. Fever is often observed to arise without any very obvious cause, and the patient is then said to have idiopathic fever. When it occurs after an injury, or when it is coupled with redness of the throat, or acute pain of the side, he is said to have symptomatic fever. It requires a more extended observation of the phenomena of disease to remark the leading divisions of

idiopathic fever, which may be considered as threefold. There are fevers which consist of paroxysms; there are simple continued fevers, and fevers complicated with eruption. In other words, idiopathic fevers are divisible into the three great classes of CONTINUED, INTERMITTENT, and EXANTHEMATOUS. Among the symptomatic fevers which fall under the cognizance of the physician, a distinction has been attempted between those which are connected with local inflammation, and those attended with hæmorrhagy. It is not one of much importance, although I have assumed it as a basis of arrangement in this work.

These are the leading divisions of febrile diseases; but to understand in what endless varieties they are presented to us, it will be sufficient to cast a cursory glance over the great variety of local inflammations with which they may be combined, and to reflect on the extent of influence, which climate, season, peculiarities of soil, age, temperament, and condition of body, may be presumed to exert in modifying their symptoms.

CAUSES OF FEVER, PREDISPOSING AND OCCASIONAL.

Very little is known with certainty in regard to the predisposition to fever. It is observed under aspects the most various. Every age, and condition of body is subject to it; it occurs in every variety of season and climate; but each of these circumstances modifies its character, and contributes to establish those minute shades of distinction among febrile diseases which it will be my object hereafter to point out and illustrate. It is, however, abundantly obvious, that some persons are more liable than others to attacks of fever. In common language, their constitutions are more easily lighted up into fever. The circumstances which appear more especially to give this predisposition to fever are the following: 1, A sanguine temperament and irritable habit of body; 2, the period of youth; 3, depression of mind; 4, peculiar conditions of the atmosphere.

The exciting causes of fever are very numerous, and apparently of very opposite characters. External injuries, irritations of various kinds existing *within* the body, (such as worms;) the free use of wine, and exposure to cold and moisture are among the most obvious. These have been called by pathologists the *common* causes of fever, in contradistinction to others of a more recondite nature which have been termed *specific;* viz. marsh miasmata, contagion, and morbid poison. Much importance is properly attached to each of these causes of fever. They open very wide fields of inquiry, which, in future chapters, will become the objects of separate investigation.

NATURE OF FEVER.

It has been a favourite topic of inquiry among all writers on fever, What is its nature?—In what particular state of the fluids or

solids of the body does it consist? The subject has been prosecuted with great diligence, but the result of the investigation is very unsatisfactory. The earliest opinion on the nature of fever was that of Hippocrates, who imagined it to be a *salutary* effort of nature to throw off some noxious matter; and it is remarkable that this opinion was entertained before the class of eruptive fevers was known, the phenomena of which certainly afford the greatest countenance to it. The same doctrine was supported by Stahl, who acknowledged, however, that when the morbific matter was too abundant, or the powers of the body not sufficiently energetic, fevers were hurtful. Boerhaave assumed as the essence or proximate cause of fever, a *lentor*, or viscid state of the blood, and he applied this principle very ingeniously to the explanation of the phenomena of fever.

The most rational views of the intimate nature of fever are those of Hoffman, who believed that fever consisted primarily in *diminished energy of the nervous system.* Without following this author through the minute explanation of the several symptoms of fever which he founded upon this doctrine, we may be permitted to say, that as a general principle it is fairly admissible, and that it satisfactorily accounts for many of the first and most characteristic among them. Dr. Cullen went a step farther, and argued that the diminished energy of the brain brought on *spasm of the extreme vessels*, which spasm was the real *proximate* cause of fever. Since Dr. Cullen's time there have been several ingenious attempts to explain the pathology of fever. Dr. Wilson Philip supports the doctrine that fever consists, not in a spasm of the extreme vessels, but in the præternatural distension, and consequent *debility of the capillaries.**

All of these theories are open to many and strong objections. An insuperable difficulty indeed seems to hang over the pathology of fever,† but it is fortunately of little moment. No theory of the proximate cause of fever which has yet appeared has contributed in any material degree to improve the treatment; though several of them, especially the Hippocratic, have had the effect of misleading and confusing the practitioner. The phenomena of fever give evidence of diminished energy of the brain, with increased action of the heart and arterial system; and the difficulty in the pathology

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* Others refer the source of fever to the inflammation of some particular organ, or organs; as, Bianchi to the Liver—Swalve to the pancreas—others to the vena cava—Rahn to the digestive function generally, and Broussais to the mucous membrane lining the intestines; and finally Clutterbuck to the brain;‡ as no facts are adduced by the advocates of these doctrines to show that the local affections preceded the fever, which they should do, if they were its causes, and as there are many fevers in which there is no inflammation, nor local affection of any kind whatever they necessarily fall to the ground. C.

† Febris, si phænomena illius spectes, reliquis morbis est notior; si constitutionem et causam omnium ignotissima.—Baglivi de Praxi Medica, cap. xiii. sect. 5.

‡ Good's Study of Medicine, p. 41, vol. ii.

of fever consists in showing, in what manner these disturbances of function are connected with each other. The older pathologists supposed it was brought about by the *vis medicatrix naturæ*, for which in modern times we have substituted the principle of *re-action;* but the precise mode in which this re-action of the heart and arteries is effected, appears to be altogether inscrutable.

To the diminished energy of the nervous system we ascribe the languor, lassitude, loss of appetite, general uneasiness and pain in the back, which mark the invasion of fever. The functions of the brain not being as yet thoroughly understood, it is doubtful whether or not we are authorized in attributing to the same source, the diminished and depraved secretion which occurs in fever; but it is highly probable, that the phenomenon is in some measure connected with it. The same thing may be said of the increased heat which attends fever, the physiology of animal heat being, like that of secretion, involved in much obscurity. It would appear, however, that this is a mixed function, in which the brain and heart are both essentially concerned.

The pathology of the fluids has been too generally overlooked by the medical world, in the examination of the phenomena of the system during fever. The experiments and observations made of late years, place the blood in a conspicuous point of view in the history of these diseases. It is not however to the humoral pathology of the ancients, that we are to look for a rational explanation of their phenomena; with them, the state of the fluids was brought into the philosophy of the system, conveyed under terms which had no meaning, and which were neither understood by their inventors, nor those they pretended to instruct. Dissatisfied with its insufficiency, the opinions of medical men took the opposite extreme, and from believing that the fluids were the most general causes of morbid phenomena, they ascribed every thing to the solids, and discarded the humoral pathology as an absurdity: at present, the more judicious part of the medical world believe, that its entire abandonment has been prejudicial, by leading the mind "from the examination of the various morbid states of the fluids and the best means fitted to correct them."*

In our own country, Drs. Hosack and Eberle have turned their attention to this subject; and from the facts and views adduced by them, they have contributed much to bring into notice the extensive effects which the fluids produce in the system. "Whether," says Dr. Eberle, "we regard the blood as a vital or dead fluid, its constant influence upon the various organs of the living system is unquestionable. For, a material which, like the blood, constantly moves through the system and penetrates every fibre; which acquires certain qualities, and loses them again in its circuit through the body; which, in fine, conveys the elements of all our secretions, and keeps in play the very fountain of life—the heart; must, it is obvious, produce a constant though imperceptible impression upon the whole organization. As long as the blood retains its healthy condition, the impressions must be compatible with the healthy performance of the organic functions of the animal economy. A change in its natural constitution, it is reasonable to conclude, must be followed by a corresponding alteration in its general influence upon the system. Thus, when it is not duly decarbonated in the lungs, the brain, together with the functions that depend on it, become torpid; and hence it appears, that a certain condition of the blood, depending on the absence or presence of certain matters, is indispensable to the regular performance of organic action." On this subject, modern experiment has accumulated too many facts, not to place the doctrine of

* Armstrong on Typhus Fever, p. 120. Am. Ed.

the pathology of the fluids on the basis of absolute certainty. It is indispensable to a proper knowledge of the diseased phenomena of the system: "and more particularly," as Dr. Hosack observes, "the recent experiments of Sir Everard Home, relating to the operation of medicines upon the body through the medium of the fluids; the communication of diseases from one animal to another by transfusion, as lately performed by Mr. Coleman, at the veterinary school of London; the transmission of disease from the mother to the fœtus in utero; the analysis of the fluids both circulating and secreted; the chemical examination of the products of the body, as occurring in various diseases have recently, both in Europe and America, directed the attention of physicians to this neglected part of the human pathology,"* and forced upon us the conclusion that the part performed by the fluids is one of primary importance in all its functions. The experiments of Harlan, Coates, and Lawrence, also are very decided on this point; they go so far as to show that medicines are absorbed into the blood, and that when admitted there, they are even decomposed in that fluid, by a play of affinities. With regard to the absorption of medicines into the blood, as also the pathology of certain diseases, explicable on those principles, we refer to the Essay of Dr. Eberle, in the Medical Recorder, for many valuable observations.† C.

Febrile thirst is a symptom which has never been satisfactorily accounted for. The restlessness, head-ach, delirium, and other disturbances of the animal functions which occur in fever, are certainly attributable to an increased flow of blood upon the delicate structure of the brain. They neither depend upon inflammation, as some have contended, nor upon debility. They are neither connected with actual *congestion* within the brain, nor are they referable to sympathy of that organ with the chylopoietic viscera, as others have imagined.

The hypothesis that the phenomena of fever are owing to diminished energy of the nervous power, is equally incapable of demonstration: To suppose that the cause of fever acts solely on the nervous power, is entirely gratuitous: The nerves and blood-vessels penetrate every part of the body so completely, that if either system were removed, its form and shape would be represented by the other which remained. To suppose, then, that the morbific particles act upon either independently of the other, is a point which cannot be proved, nor admitted into a system of correct medical principles, without the necessary preliminary to all scientific truth—absolute and indisputable demonstration. What theory is then to be admitted? To this we answer, that the human body, like all others, is capable of being acted upon by physical agents, and the effects, not the mode of their operation, are known, and the senses are the instruments by which we are apprized of them. As these instruments discover only certain phenomena, without apprizing us of the subtle changes which the system undergoes, and by which they are produced, all we can say, is, that the phenomena are all we know, and that the true philosophy of medicine is to describe their successions, with the means of their prevention and cure: This it can do; but it can do no more: as in natural philosophy, it is impossible to determine the nature of gravity on which hang the laws of that science; so in medicine, the intimate properties of life are equally inscrutable; the effects of the principle upon other bodies, and of other bodies upon it are all we know; we therefore think the ideas of Fordyce, contained in the following words, present a true view of the subject of fever, and one, which is free from hypothesis and consistent with the best philosophy.

Fever is a disease which affects the whole system; it affects the head, the trunk and the extremities; the circulation, absorption, and the nervous system; it affects

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* See Hosack's Essays, vol. ii. p. 92.

† On the Humoral Pathology, vol. v. Med. Recorder; Dyckman's Essay, and the Philadelphia Journal of the Med. & Phys. Sciences.

the muscles and the membranes; it affects the body and likewise the mind. It is therefore a disease of the whole system, which, however, it affects unequally; at sometimes one part; at others, another, &c.* C.

PERIODIC MOVEMENTS IN FEVER.

Many of the phenomena of fever, its progress, and termination, appear to be guided by one of those laws of the animal economy, the influence of which is sufficiently manifest in a state of health—I mean the principle of *periodic movement*. The most obvious illustration of this which physiology affords, is in the periods of utero-gestation and menstruation; but the recurrence of our appetites, the disposition to motion, sleep, and waking, and, in many, the natural evacuations, are phenomena regulated also by a principle of periodic movement. The regularity observable in the periods of the eruptive fevers, of which we shall hereafter speak more fully, is unquestionably the most beautiful and well-marked illustration of the same thing which pathology affords; but it is exemplified also in some of the phenomena of gout, mania, epilepsy, and menorrhagia. To this principle of periodic movement in the animal economy have been ascribed the *types* of intermittent, and the *crises* of continued fevers. Of the former we shall treat more fully hereafter. What is essential to be known concerning the latter, may find its place here.

The doctrine of critical days in fever, that is to say, the supposition that febrile diseases are disposed to terminate favourably or unfavourably at certain periods of the disease more than at others, has found many advocates, and some opposers, even from the earliest times. The very general reception which it has met with among mankind, makes me unwilling to distrust it altogether; and if we bear in mind how many circumstances may contribute to disturb the regular course of the disease, we may admit the doctrine of critical days in fever without much risk of error. There has been some dispute about the precise days, but they are generally set down as the seventh, ninth, eleventh, fourteenth, seventeenth, and twenty-first, counting from the invasion of the cold fit. During the first week of fever no days of crisis can be ascertained. In the second week it happens on the alternate odd days, and the three first are therefore called the tertian crises. In the third week, the critical days follow the quartan type, and the three last are therefore called the quartan crises. It is seldom that these observations can be verified in the fevers of this country, which run their course with much less regularity than those of warmer climates.

The last illustration of that principle of periodic movement

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* Good's Study, &c. p. 42. vol. ii. The above is the substance of his views, and nearly his words. They express simply the history of the phenomena and their successions, and not the vagaries of the imagination. C.

observable in the diseased actions of the body, which I shall now notice, is the disposition in all febrile diseases whatever, to evening exacerbation and morning remission. This is strikingly manifested in *hectic* and *infantile* fever; but it is equally to be traced in all the more common forms of continued fever. Severe as the symptoms may have been during the day, they will generally be found aggravated about six or seven o'clock in the evening. Restless as the patient may have been during the night, he will generally obtain some rest, or relief from his complaints, soon after daylight. These circumstances are important in reference to the proper period for the exhibition of medicines.

PRINCIPLES OF TREATMENT IN FEVER.

A few general remarks on the principles which should regulate our treatment of idiopathic febrile diseases, will conclude what is to be said regarding the general doctrine of fever.

1. The most important feature in this view of the subject is, the natural tendency in all febrile diseases to run a certain course, and to terminate in the restoration of health. It is this circumstance which forms so prominent a distinction between acute and chronic disorders. It is observable in many local affections attended with fever, but it is very strikingly illustrated in the case of continued fevers, and the exanthemata. The latter will always, and the former will very frequently, run their regular course, in spite of all the efforts of art. In ancient times, nay even at no very distant date, it was made a question, whether it was safe and proper to cut short a fever. The question is set at rest with regard to the *propriety* of doing so, but the possibility of it is still very questionable. It may sometimes be practicable, but it can never become the foundation of our treatment in febrile diseases. The natural tendency of fever to come to a crisis, or to work its own cure, may, on the other hand, be often kept in view with the best advantage; and though the extravagancies of a *medicine expectante* are justly blameable, the spirit of the doctrine should never be disregarded.

The idea that fever cannot be cut short, is one which in general is advocated by feeble practitioners; by men who are averse to all energetic measures, and who desire rather to continue in the beaten track, than to advance the science by judicious measures. How soon may be the natural termination of a fever; whether in one fit, two, three, or ten, it is impossible to decide; it is therefore absurd to let the more or less speedy prospect of its future termination have any thing to do with our measures, except so far as the fever must at every moment be considered as a noxious cause, which is necessary to be removed as soon as possible. The ordinary remittent and typhus fever of hot climates have been cut short by mercury, which, as soon as it begins to act upon the gums, often has this effect; cold water thrown on the surface has stopped at once common fevers; and even the yellow fever has been cured, by the excessive and profuse evacuations of bleeding and perspiration. The advancement of a doctrine that fevers cannot be cut short in their course, and in every stage of it, is one that is not entirely true; and, as it tends to paralyse the pursuit of new and useful truths, should not be held up in such strong language by

the author. The quartan type of intermittent was once considered as incurable; now it is not more so than other forms: the dropsy was once viewed in the same light, but it is now, except where the constitution is worn out, considered as a disease which is often cured. Fever is a disease which presents a certain combination of symptoms, that conspire to destroy life; and the practitioner should only have in view, their removal by the application of such physical means, as are suited to this purpose, without regarding what may be the disease some days hence, but what it is now. This observation applies most particularly to highly inflammatory pleurisy, and other phlegmasiæ in robust habits; bleeding as long as there is any pain cuts it short; without it, it is protracted or the patient dies of abscess: the same is true of the inflammation which follows extensive wounds; as after the operation for the stone: bleeding till the pain is removed, and repeated as often as it returns, cuts short the reaction and perfects the cure. This is true not only of acute but of chronic diseases: the application of the proper medicine at once cuts them short, whereas procrastination confirms the diseased habit, strengthens the causes and increases the difficulty of the cure. Nil desperandum should be the motto of every man engaged in the practical duties of life, particularly in a profession on which so much depends as that of medicine. C.

2. We might lay infinitely more stress on this principle in the general treatment of fever, and act up to it with much more freedom, were it not that a second interferes with it, of at least *equal* importance, but leading to a practice diametrically opposite. This is, the disposition which exists in all febrile states of the system to local congestions and inflammations, and irregular distributions of blood, which end in very serious disturbance of function, or actual disorganization of structure. Such a principle appears to have been overlooked by several of the old school of medicine, or at least never to have attracted that attention, which its importance in practice merits. It shows the necessity of using every endeavour to cut the fever short, before such local congestions or inflammations have taken place, or at any rate before they have attained any dangerous height.

3. The third point which I think of importance in regulating the treatment of fever, is the necessity of studying symptoms and of deducing from them the indications of cure. The pathology of fever is so obscure, that it affords but little help in determining the plan of treatment. In many diseases, apoplexy for example, or dropsy, individual symptoms are of little practical importance, for we treat them by a consideration of their cause: but in fever the alleviation of particular systems is often a matter of the highest importance. The variations too in the symptoms of a fever are often great and rapid; and with them must vary our views of the actual condition of the body, and consequently the plan of our treatment. It will be seen hereafter, that this point of doctrine applies to all the forms of idiopathic fever.

As to the obscurity of the pathology of fever it is not more so, than any other subject of physical science. The symptoms are the only subjects of observation cognizable by the senses; they are the phenomena, by which we judge of the nature of the subject; and in proportion as we know them accurately, extensively and minutely, so in proportion do we know the nature of fever: the body is known only by the qualities it presents to the external senses, and just in the same manner as the subjects of natural philosophy are; and it is, in a rational view of the subject,

as absurd to pretend to discover the nature of fever or its pathology, by any other mode than by the examination of its symptoms or qualities, as it is to discover the nature of gravity without studying the phenomena: there is a mystery behind the phenomena in both cases, and there ever will be, as long as the human mind is so weak as to indulge itself in looking farther than the appearances, which each exhibits to the senses. The idea that there is in every physical subject an essence, or subtle something, round which the phenomena are aggregated, is the source of this error: It led to the absurd speculations on the subject of gravity before the time of Newton, as it does now to those upon fever; which, like gravity, is only to be known by its qualities or symptoms. To prescribe for any thing else is to prescribe for a word—viz. fever; an error which the author has committed in his views with regard to apoplexy and dropsy, which he seems to regard as independent and immutable essences, to be treated in the same way, under all circumstances; however, like all other subjects of medical enterprise, they vary, and we know this, because their symptoms and characters vary, and as also the results of treatment in different modes; thus, dropsy during the prevalence of an inflammatory atmospheric constitution is known to require bleeding, which in general it does not; apoplexy sometimes requires stimulation; often, bleeding; sometimes it is attended with a general warmth of the skin and whole body; at others coldness of the feet; to restore the warmth of which constitutes an essential part of the treatment, and is a successful means both of its prevention and removal; whereas, when the skin and feet are warm, it of course is not so. The view which regards fever as an independent existence, or its pathology as a subtle essence, is as great an absurdity in philosophy, as the belief in ghosts or fairies, or any other imagination of the human mind; which neither knows nothing, nor has a right in true philosophy to conceive any thing of the external world, but what is derived from the senses. C.

4. The necessity of attention to the nature of the prevailing *epidemic* is the last point which I would urge. Epidemic diseases are with very few exceptions febrile; and it is a curious but well ascertained fact, that the epidemics of particular seasons acquire a particular character, the knowledge of which assists very materially in forming a judgment as to the treatment proper to be pursued in any individual case. Sydenham was among the first authors who directed their attention to the *epidemic character of seasons.* He pointed out, not only that different febrile diseases prevailed in different years, but that the same form of febrile diseases assumed in different years different characters, and required corresponding changes of treatment. This important doctrine might be illustrated, not only by the phenomena of continued fevers, whose characters are so infinitely varied, but by those also of agues, and the inflammatory affections of the thorax and abdomen. The principle is observable even in the phenomena of eruptive fevers, such as small-pox and measles, which are but little modified by the influence of other causes.

This is true not only with regard to fevers, but to all other diseases during the prevalence of an epidemic: thus Stoll found that dropsy and abortion required depletion as well as the prevailing fevers and inflammations; the constitution of the year is necessary to be known, in order that the remedies may be given of a strength adapted to the force of the disease, that weak medicines may not be given when strong are required, and vice versa. It has been believed that more faith is to be put in a knowledge of the particular plan of treatment adapted to each epidemic, called a knowledge of the constitution of the year, derived from practice, than by attention to the particular symptoms of the diseases we are called to treat; and this really appears to be true, as all diseases partake of the nature of the

reigning epidemic; catarrhs, abortions, hemorrhagies, rheumatism, in the epidemic of 1788 at Vienna were treated in the same way; in the yellow fever of 1793, the same was true; all diseases in the whole range of sea, island, and land, north of the line, during that year were cured in the same way; depletion was the sovereign remedy. In the year 1813-14 typhus prevailed to an alarming degree in the United States; stimulation then was the only means of cure, and many died, whatever might be their disease, who were treated by any other plan.

These reflections show the necessity of perfect unanimity and harmony among medical men, in order that by a free intercourse they may inform each other of the results of their experience, and the nature of the prevailing epidemic; which can be discovered only by practice, and not by symptoms; these, however, regulate the force of remedies after the general plan is determined from observing the diseases of the peculiar constitution. C.

CHAPTER II.

VARIETIES AND SYMPTOMS OF CONTINUED FEVER.

Nosological Divisions of continued Fever—Circumstances modifying the Symptoms of continued Fever; Climate and Season; the State of the Air; Constitution and Habit of Body—Symptoms of Inflammatory Fever—Of common continued Fever—Of Typhus—Of Fever complicated with local Affection—Causes of such Complication—Of the Organs and Structures affected in the Course of Fever—Nature of the local Affection—Morbid Appearances from continued Fever—Period of Fever at which local determinations take place—State of Oppression in Fever—Principles of Prognosis—Of Malignancy and Putrescency—Favourable Symptoms—Average mortality by continued Fever.

NOSOLOGICAL DIVISIONS OF CONTINUED FEVER.

Idiopathic Fever was stated in the last chapter to admit of a three-fold division; viz. into intermittent, continued, and eruptive fevers. We shall begin by the consideration of continued fevers, and in the present chapter shall confine our attention to the various appearances which they exhibit.

The views of physicians with regard to continued fevers have undergone a number of very remarkable changes, to which nothing has more essentially contributed, than the infinite diversity of symptoms by which they are characterized. Nosologists have been at great pains to note minutely these different symptoms, and have founded upon them their divisions of continued fever. Boerhaave has three, Linnæus four, Sauvages five, and Macbride five-and-twenty species of continued fever. Some have assumed, as the basis of their arrangement, the comparative duration of the disease; but the generality of authors have made the difference of symptoms the ground-work of their distinctions. From the very earliest periods it was observed, that some fevers showed symptoms of strong inflammatory action, while others exhibited marks of depressed nervous energy, and, as it was said, of *putrescency*. One of the first distinctions therefore among fevers was into the *febris ardens* and

the *febris putrida.* There being however a variety of fevers, which showed first the one, and then the other of these sets of symptoms, nosologists added a third class, or that of *mixed fevers.* Such is the arrangement of Dr. Cullen; and the terms Synocha, Typhus, and Synochus, were employed by him to express these fundamental divisions of continued fever.

Of late years, a different view of the varieties of continued fever has been gradually gaining ground. An increased importance is attached to the *exciting cause*, and the term *typhus* is now restricted to a particular form of continued fever, which we shall presently describe; one of the distinguishing features of which is, that it is communicable by contagion. To the other varieties of fever, arising from cold or irritations, we apply the term *common continued.*

A third important distinction among continued fevers is now derived from the circumstance of their affecting all organs and functions equally, when they are called *simple fevers*, or implicating one organ or structure more particularly than another, and deriving from it some peculiarity of character. Fevers of the latter class are infinitely diversified, and have received the several denominations of brain fever, catarrhal fever, gastric, mesenteric fever, miliary fever, bilious fever. These distinctions among fevers, though apparently vague, are yet sufficient for all practical purposes. They do not withdraw the mind from the important consideration, that the nosological divisions of fever are arbitrary, and calculated, not to direct the method of cure, but to increase the facility of instruction.

CIRCUMSTANCES MODIFYING THE SYMPTOMS OF CONTINUED FEVER.

Continued fevers have all a common character, but various circumstances serve in a remarkable manner to modify it. What these are, and the extent of their influence, is a subject worthy of accurate investigation.

CLIMATE AND SEASON.

1. The most important of them all is climate. Its effects upon the general character of man, the structure of his body, his stature, his intellectual faculties, his habits, and dispositions, it is the province of the physiologist, the natural historian, and the political œconomist, to unfold. Its influence upon the morbid conditions of the body, we shall have frequent opportunities of illustrating. We shall see it exemplified in the phenomena of hepatitis, gout, scrofula, dysentery. Of all states of disease, as fever is the most general, so is it that, over which climate has the greatest modifying influence. The important principle to be kept in view is, that a hot climate is favourable to the developement of inflammatory fever;

while the low, or nervous form of fever prevails chiefly in colder or temperate climates.

2. Season may be considered as modifying the character of continued fever much in the same manner as climate. The spring and summer seasons favour the prevalence of inflammatory fever; autumn and winter of the putrid or nervous fever. Warm climates and seasons give a tendency to complications of abdominal disease with fever; cold climates and seasons, on the other hand, to affections of the thoracic viscera. The evidences of this point of doctrine will appear when we come to treat of the diseases of particular organs.

These remarks of the author, though short, are of the greatest importance; thus the spring, owing to the heat succeeding the cold of winter, makes remittents inflammatory and dangerous; the autumn, on the contrary, from the reduction of temperature, after the heat of summer, renders them tedious. Dry cold weather from the north, from its inflammatory tendency, makes agues regular in their type, and at the same time renders V. S. proper. On the contrary, moist weather with a southerly wind, makes them tedious, typhous, and malignant: by thus appreciating the general effects of the sensible qualities of the air upon the body, we are assisted in forming an accurate prognosis directing the proper treatment of these diseases. If a cold dry wind prevails for some time, diluents will be more proper, and a less stimulating treatment than if the weather be cold and moist, in which latter case the bark and other tonics and stimulants are useful. The influence of the weather upon the type of diseases in this country, is not believed, as regards the changes which take place in short intervals of time, as from week to week, though on a larger scale, as when the diseases of winter are compared with those of summer it is; when those of the countries near the equator are compared with those in the north, they are acknowledged to be different; and as they are so, it is rather astonishing, that the effect of the weather on the character of diseases, in short spaces of time, should not be more regarded: thus, in typhus, the effect of the tonic qualities of the air are observed; but, in intermittents, diseases, which many practitioners think they can cure without difficulty, it is not suspected, when the current train of symptoms in an individual case is taken into view. It is by appreciating the effects of these agents of a general nature, by combining their influence in a scientific and accurate manner, that the profession of medicine is rendered useful. It was an observation of Stoll, of Vienna, that a physician, who did not observe the influence of the weather upon the system, could not practice with safety to his patients; and that it was as necessary to be attended to, as the symptoms of every case.

Habit has great effect in regulating the effect of morbid causes; thus the inhabitants of northern climates become sick on going to the south, and the reverse; a person accustomed to lying in bed for a long time, feels no inconvenience from it; one who is not, is thrown into fever, more particularly if confined to one posture, and that an awkward one; on this account, previously to performing operations, confinement for some time in the posture in which the patient is to lie after the operation, prevents fever.

Inhabitants of wet countries are more susceptible of the diseases produced by dryness, and vice versa. It applies to all the causes which operate upon the system. Pringle relates, that in the army on taking the field in the spring, the sick increased, for the first month, in numbers considerably, but that afterwards they regularly decreased,* from the influence of habit. There is in every cause, which is necessary to the system, a medium degree, in which its effect is most salutary: thus, between 50 and 60 with regard to temperature; the state of the air produced in a country gently undulated and rolling, (if no large body of water is near,) four or five hundred feet above the level of the surrounding

* Pringle, Rush's, p. 103.

country, or higher, if the ocean or much water is near, furnishes about the proper medium with regard to moisture: air at that height invigorates even invalids, whose sensibility is accumulated, to so morbid a degree, as to be able to foretell all its changes, with regard to moisture, five or six hours before they take place, and who are so sensible to cold, as to feel the difference of effect produced by the depression of temperature a few degrees below 75° or 80° of Fahrenheit, which to them is the comfortable temperature. To all persons the elevation of about four hundred feet above the surrounding country is healthy, and even within the tropics pleasant; at the height of six hundred it is more so; at the height of from fourteen to fifteen hundred it is observed that people live to a great age; above that height even within the tropics, it becomes damp and raw, and the people are subject to inflammatory diseases, as in northern latitudes; in higher situations these diseases increase, till scurvy, on very high elevations, as Pinchincha in Peru, appears, and the system becomes as incapable of supporting it* as in low, marshy, or other very moist places. It is this medium, which as a preventive and curative mean, the physician must always have in view, and it is by the deviations from it that the effect of the sensible qualities of the air, in the various seasons, climates, and latitudes, are to be estimated.

To show the effect of climate and season, moisture and heat, &c. upon fevers, we shall go a little into detail:

A low temperature produces simple inflammatory fevers and inflammations; as it rises above the temperate point, intermittents of the tertian form appear with slight bilious discharges; they become quotidian, and at last remittent, as the summer advances; remittents with their visceral complications increase with the heat, become malignant, and at last, as it moderates, agues in northern and cold climates, appear in the quartan form, or more to the south, in the tertian; remittents, from inflammatory, becoming typhus at the same time; all of which, though obstinate, are less dangerous. The intestinal varieties of summer diseases, also observe a particular order; dysentery and diarrhœa are most common in wet and changeable seasons, and also in the autumn, when the days are hot and stifling, and the nights cool; (we speak now of southern latitudes.) Heat alternating with cold from any cause, favours the production of these diseases. Cholic and cholera appear early, as the first effect of sudden heat; in children, whose systems are weaker, it is always the result of the first hot weather, particularly in cities, and continues generally throughout the summer. In India it becomes epidemic from the excessive heat; however, in some seasons diarrhœa and dysentery prevail early, and in others they are not seen. In some neighbourhoods the intestinal forms are more common, in others, fevers; they both appear in places where animal and vegetable putrefaction is greatest; or where from the use of improper food, as damaged flour, (which sometimes occurs in cases where the supply is general and difficult, as in armies,) or acid fruits, or ripe fruit taken in enormous quantities, which by weakening the bowels predispose to these diseases. Sometimes sudden changes of the air from unseasonable heat to cold, also produce this last variety in the spring; exposure to the air in tents and lying on the cold ground, produces it in armies; diarrhœa and griping pains arise from the same causes; in the same manner great heat early in the spring introduces choleras, cholics, and remittents, sooner than usual; its effect is increased by dryness of the air to a certain extent consistent with putrefaction; whilst refreshing showers postpone the appearance of summer diseases till a later period. The same causes also which hasten or postpone these diseases, render them more intense or more mild; an excessively dry and hot season rendered the remittents of Pennsylvania and Ohio, in the summer of 1822, typhoid and excessively mortal; the south wind also increases their malignity and danger in dry and hot seasons; the dews supplying the moisture, by which putrefaction, the source of these fevers, is produced. But if the showers, instead of being refreshing, are excessive, from their combination with excessive heat, great mortality is the result; if the showers cool the air, the disease ceases; if it be merely moist without showers, it increases it. Relapses are then more frequent from the power of their causes, which declines as the autumn advances, till

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* Bouguer Mem. de l'Acad. Royal. des Sciences, 1744.

the frost appears, when it is entirely lost. In the ensuing spring these diseases again recur, with their consequences, obstructions of the liver, spleen, dropsy, and tympanites. The winds also have an effect, according to their temperature; north and northwest winds, in the United States, prevailing in the spring, will prolong the inflammatory diseases and agues of that season, and delay the appearance of the summer fevers; whilst winds from the same quarter, in the summer, are cool, dry, and healthy, because they dispel the vapours, produce a clear sky and a pure invigorating atmosphere; they render the remittents milder, when they are disposed to become malignant, and if they continue long, they suspend these diseases altogether. If, however, the winds from the northeast and east prevail, and the summer be cold and wet, the remittents sink into the typhoid form. Quotidians become tertian from the same cause; from tertian they become quartan, and sink into dropsy and nervous diseases. Relapses are frequent during wet seasons. These observations, though made in a northern latitude, apply to all climates; such is the effect of habit on the constitution, that the vicissitudes of the weather from hot to cold in the south, though slight, are as much felt as in the north, so sensible is the system: thus, even death from exposure to cold, sometimes occurs in the winters of Carolina; further, the yellow fever has appeared at Copenhagan in an excessively hot summer, from the effect of the generally low temperature of the climate. The diseases of Guinea are mild among the natives, whilst among foreigners from a northern climate visiting that region, they are horrible, and produce death in a few hours. In autumn the north wind produces the same effects; it is always refreshing and salutary. From the north and east on this side of the Atlantic, after the great heats are over, it introduces the intermittent form, and when it appears suddenly, produces the dysentery. The prevalence of winds from the south in the spring, hasten the early appearance of the remittents of summer, with their attendant varieties—cholera, cholic, diarrhœa, dysentery, and hepatitis; and increases their danger. This is true of the continent of Europe as well as of the United States; when the wind veers to points east or west of south, the Atlantic or Pacific oceans furnish vapours, which, borne over this great continent, dispel the inflammatory diseases of spring; and if they continue, the intermittents of that season are changed into remittents, and gradually, as the summer advances, assume a malignant character, because they favour putrefaction by their heat and moisture. Relapses are more frequent during the prevalence of these winds; they affect, also, the respiration and depress the spirits. The routine of these diseases, as stated above, is the result of the alternation of temperature; the winds, according as they increase or diminish the temperature, hasten or retard these diseases in their succession, or abate them in their violence; cold in summer abating the forms peculiar to that season, in spring and autumn approximating them to those of winter; whilst the diseases of winter are moderated by the increase of temperature, and are made to resemble those of spring or autumn. These remarks explain the effect of latitude on diseases. C.

THE STATE OF THE AIR.

3. The next of those circumstances which strikingly modify the symptoms of continued fever, is the condition of the air. The influence of the atmosphere on febrile diseases is a subject that opens a very wide and difficult field of investigation. It appears, that of those states of the air which affect the origin, diffusion, progress, and character of fever, some are obvious to our senses, and some not. Sydenham has described these under the appropriate designations of the *temperies aeris manifesta*, and *occulta*. The condition of the air, in regard to heat and cold, dryness and moisture, must obviously exert an important influence; but it has further been always observed, that the most dangerous fevers are those which prevail, where the atmosphere, in its chemical composition, is

impure from the neglect of proper ventilation. Such a vitiated state of the air (very liable to occur in camps, jails, ships, crowded and small apartments) gives occasion to those symptoms which are called *low or putrid;* while, on the other hand, a free circulation of cool and pure air conduces to the developement of those which are now generally called the symptoms of *excitement.* This is sometimes exemplified in a remarkable manner, in the sudden removal of a patient labouring under continued fever from an impure atmosphere into the spacious wards of a well-regulated hospital. The symptoms have under such circumstances been observed to alter very materially, and the constitution to undergo such a change, as to require, and to enable the practitioner to carry into effect, measures which were previously inadmissible. But besides those obvious qualities of the air which modify the symptoms of fever, there are certain others, undiscoverable by any of our senses, which appear to have great influence over them. A few conjectures have been hazarded by Sydenham and others, with the view of throwing some light on the nature of these *occult* qualities of the air; but the subject is involved in a degree of obscurity, which will probably for ever continue to baffle our researches. Their existence, however, can hardly be doubted, and to them we must in a great measure attribute the prevalence of *epidemics,* still more decisively the curious phenomenon alluded to in the last chapter, the *diversity* in the character of the epidemic diseases of different years.

CONSTITUTION AND HABIT OF BODY.

4. The last which I shall mention, in an enumeration of the important circumstances which modify the symptoms of fever, is confined in its operation to the affected individual;—I mean constitution and habit of body. The extent of influence which peculiarities of constitution and habit of body exert over the symptoms and character of fever is, however, less than might naturally have been expected. The important fact indeed is, that under circumstances the most opposite, fever often shows the most striking uniformity—that the young and the old, the robust and the delicate, the active and the idle, the dissolute and those of regular lives, exhibit, when attacked by fever, the same series of symptoms. Still a certain degree of allowance must always be made for the constitution and habit of body of the individual affected; and it has been found that a number of minute circumstances referable to this head, tend in different ways to the modification of fever Of these the principal are, the period of life, the temperament of the body, the tone of the fibre, the kind of diet on which the individual had been previously nourished, and the state of the mind.

The period of infancy enjoys a very remarkable exemption from idiopathic continued fever, although abundantly susceptible of fever in other forms. "Labour, temperance as they increase the tone of

the system; intemperance;" the period of youth, the sanguine temperament, and a full diet of animal food, with a proportion of wine or distilled spirits, give a tendency to an inflammatory character in the fever. On the other hand, weakness of body and flaccidity of fibre, whether the effect of original formation, or of previous diseases, or of great exertion, or long watchings, or deficient nourishment, conduce to the low and typhoid form of fever; and it is therefore in individuals of this habit of body, that the purest cases of typhus are observed. The state of mind is universally found to have great influence over the susceptibility of the body to the reception of continued fever. The depressing passions, anxiety, fear, despair, dispose to the propagation and add to the malignity of fever; while hope and confidence serve, in a manner no less remarkable, to ward off its attack, or to stem its violence.

I have already attempted to explain, that though continued fever should be considered as a single *genus*, yet for the convenience of illustration and description, it is useful to make some broad distinctions among its various forms. I pointed out a division into inflammatory, common continued, and typhous fever, as one that was well adapted for an elementary view of the subject. The symptoms commonly presented by these different forms of fever may next come under our notice.

SYMPTOMS OF INFLAMMATORY FEVER.

1. Inflammatory fever (the *Synocha* of Dr. Cullen) is not often met with in its exquisite form in this country. It is that, however, which fever assumes in all hot climates where there is no *peculiarities of soil* to interfere with its developement. It is instanced in the summer fever of Sicily and the Mediterranean, as described by Dr. Irvine, Dr. Burnett,* and others. Its invasion, which is generally very sudden, is marked by excessive prostration of strength, with some shivering, soon succeeded by a violent heat of skin, pain of back, head-ache, giddiness, and general uneasiness. The head-ache is very acute, the eyes are suffused and cannot bear the light, the countenance flushed. The temporal and carotid arteries beat violently. There is often bleeding at the nose, with restlessness; and occasionally, but by no means constantly, delirium. The tongue becomes rapidly coated with a thick fur. Nausea, vomiting of bile, great thirst, and a costive state of bowels prevail. The pulse varies from 100 to 120, strong, full, and regular, the blood buffy, the pulse sometimes is weak, small and depressed and rises on bleeding. The respirations are quick; the skin hot and excessively dry; the urine scanty and high coloured. Violence in the degree of symptoms, and rapidity of progress, are the prevailing

* Irvine's "Observations on Diseases chiefly as they occur in Sicily."—Burnett's "Account of the Fever of the Mediterranean Fleet."

characters of inflammatory fever. If suffered to run its course, it may prove fatal in less than twenty-four hours. If proper measures are pursued, the disease will yield; but unless they are speedily resorted to, lingering convalescence will be found to follow, attributable in all probability to some local mischief in the delicate structure of some organ, particularly the brain, occasioned by the violence of the first atack.

The above symptoms give a general outline of the inflammatory form of fever, in hot, and also in cold latitudes, where the system is plethoric and strong and the weather dry and other circumstances are favorable to a highly tonic state of the system. Its character is distinguished by its violence, its regularity in all its paroxysms, ending by a full perspiration, and a perfect remission; its characters where it is attended with no danger, as to the pulse and the state of the skin, resembles much the excited state of the system on using violent exercise; the skin being warm but not excessively hot; the pulse full, strong and regular, without a great degree of tension. If, however, as above stated, the pulse becomes hard and vibrating, the skin dry, harsh, constricted, red, and pungently hot, the disease may be considered to be violent and dangerous. In the West Indies this holds good, and it is also described as occurring in the northern latitudes of Europe. There are some varieties however which deserve notice, and will give a general idea of the manner in which fever is diversified; thus Dr. Jackson describes a variety of inflammatory fever in Jamaica, not unfrequent in summer in the United States, in which the pulse was frequent, quick, hard and vibrating during the paroxysm; the heat intense; the secretions and internal functions considerably disordered, with a dry and strictured state of the skin; the remissions obscure, with a preternaturally hard and frequent pulse; sometimes this state of the system is attended with greater degrees of irritability, with marks of violent excitement during the fits, with great languor and depression of spirits in the remissions; the pulse at one time hard, irregular and quick, at another frequent and low, sinking under a small degree of pressure; the heat of the body not always great, but pungent, and leaving a disagreeable impression on the hand, the secretions irregular; the countenance confused, clouded and overcast, eye sad, sometimes inflamed, the feelings unpleasant, with great irritability of temper, and a strictured state of the skin. These symptoms are sometimes general, sometimes partial and connected with a local affection. If the substance of the liver or lungs is affected, the fever does not run high; if the membranes enveloping them, it is excessively so.* In general, the causes which produce this fever are excessive cold or heat suddenly applied, when the system is greatly excited by exercise, spirituous liquors, violent passion, as anger, favoured by youth, a robust habit and a residence in a dry air, or by animal food: the causes which predispose and excite fever before mentioned also have their effect. C.

SYNOCHUS OR COMMON CONTINUED FEVER.

2. The common continued fever of this and of most other temperate climates (the *Synochus* of Cullen) is less sudden in its invasion, less rapid in its progress, and all its symptoms are less violent. The patient is generally under its influence several days before he is confined to bed. The pulse at first is frequent and strong, but by degrees it loses strength without diminishing in frequency. The duration of the disease is very various; but when once the symptoms of fever have subsided, the convalescence is usually rapid.

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* A Treatise on the Fevers of Jamaica, 1795. Philadelphia, p. 92-3.

TYPHUS OR NERVOUS FEVER.

3. To the severest cases of continued fever which occur in temperate climates, which have their origin, as we shall presently explain, for the most part, in contagion, and which run a course of not less than three weeks, presenting in their progress a different class of appearances from those which characterize inflammatory fever, physicians apply the name of *typhus*. The detail of symptoms which has been already given obviously points out that in inflammatory fever, a high degree of arterial excitement is present, and such are classed together therefore under the title of the *symptoms of excitement*. With them, although in a minor degree, typhus fever may begin; but ere long they are succeeded by a set of symptoms which denote a great depression of nervous energy, and which are familiarly designated under the title of the *typhoid* symptoms, or the *symptoms of collapse*.

The patient complains of a slight feeling of indisposition, of chilliness, alternated with slight and sudden flushes of heat, listlessness, uneasiness of the head, sleeplessness, or if he sleeps, he groans, starts or is otherwise uneasy, and rises without being refreshed, dull aching pain in the head and limbs, with soreness of the flesh; pulse at first quicker than natural, sometimes so weak in very dangerous cases as to almost disappear on rising from bed, or using any exertion; depression, sighing and oppression in breathing, nausea, want of appetite, which increase for several days, the patient being well enough to be up, without at the same time having the power to attend to business. The disease is then fairly set in, increasing in the evening and declining towards morning. The tremor observed on putting out the tongue, or raising the hand, is perhaps one of the most characteristic symptoms of this fever; it occurs, both when it follows the common continued or other more violent forms, or when the symptoms set in typhous from the first:

As the fever advances, these symptoms become more intense, particularly the nausea, general pains and confusion of head, and despondency; the pulse varying in quickness, in strength and fulness, at different periods of the day:

Sometimes the disease sets in more violently; there are great pains in the back and limbs, weariness and a burning pain in the stomach, vomiting, vertigo, dimness of sight, and numbness of the extremities.* In other cases the rigors from the first are strong; pulse small, soft, and sometimes irregular, with excessive uneasiness, dejection of spirits, and confusion of head; the tongue trembles, the limbs shake; sometimes the patient falls down suddenly in a lifeless state.† C.

Many of the characters of typhoid fever are unsusceptible of accurate description; and of these the most remarkable is the *expression of countenance*, so uniform as to make all typhoid patients, in a great degree, resemble each other. It is a very peculiar expression of *anxiety* joined to a flushed appearance of the cheeks. It is seldom wanting, and constitutes, in fact, a striking characteristic of typhus. The pulse in this form of fever is very frequent, generally averaging from 120 to 130, small and weak. 'As the disease advances it becomes intermitting and irregular; these symptoms increase till the extremities become cold some hours before death, when it ceases at the wrist in the above weak states of the pulse. The

* Philip, vol. i. p. 171. † Ibid.

breathing is frequent, weak, interrupted with sighing and a dry cough; the voice is low, weak, shriller and harsher than natural.'* The tongue, at first 'white, and' very much coated, becomes in the progress of the disease brown, or almost black; it is dry and parched; occasionally, instead of being coated, it appears 'chopped and firm, or' smooth and præternaturally red. Black sordes collect around the teeth. 'There is a difficulty of swallowing from the dryness of the throat, sometimes from convulsion in its muscles.' The evacuations from the bowels are exceedingly fœtid, and often black, or mixed with blood. 'Diarrhœa attends almost always the last stage of typhus; the bowels are distended with wind, and the danger is in proportion to the violence of this symptom; Dr. Smith says he never lost a case in which the bowels were constipated during the whole of the disease, nor has he ever known a fatal case unattended by diarrhœa.' As the disease advances they are passed involuntarily. The urine is in like manner fœtid, turbid, and in small quantity, reddish, clouded, "or watery like whey." The skin is hot and dry. 'At first there frequently appears no peculiarity, the heat even appears lower than natural, but afterwards the sensation of a sharpness and burning is communicated to the fingers; the patient is thirsty, without appetite, is often nauseated, and rejects a viscid, colourless, transparent fluid, without taste or smell, or consisting of bile almost entirely, especially in hot climates.'† From an early period of the disease delirium occurs, of a low muttering kind; and tremors, subsultus tendinum, with total want of sleep, and great uneasiness or *restlessness*, supervene. Sometimes however there is *stupor*. 'Delirium generally appears in the progress of the disease, and coma towards the last; sometimes the delirium partakes of the character of mania, and after recovery there is often a total forgetfulness of every thing that has passed during the disease; the hearing is often impaired almost from the commencement; the sense of sight is not generally weakened till the last, excepting in a few instances when it becomes false or distorted.‡ The eyes appear dull, heavy, languid, and towards the end of the disease they become watery; sometimes they are much more sensible to light.' Typhus is further characterized by extreme weakness of muscular fibre. The slightest exertion, such as rising in bed, aggravates all the symptoms, or even brings on a fit of syncope. 'Hemorrhagies take place most frequently from the bowels, sometimes from the nose and more rarely from the kidneys; and in adult females from the womb; livid spots appear on the blistered surfaces, which become black and gangrenous.'§ The body emaciates rapidly. Effusions of blood underneath the skin take place, and appear in the form of livid spots or streaks, called petechiæ and vibices. 'They are

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* Philip, p. 176, vol. i.
† Philip, p. 178-9, vol. i.
‡ Smith on Typhus, p. 30.
§ Smith, p. 34.

either red, brown, or blackish; the darker the colour the more ominous are they: they appear generally on the breast and back from the size of a pin's head to an inch or two in diameter. Sometimes they appear in large blotches giving the skin a marbled appearance. When they appear early they are thought to portend great danger; they indicate and are sometimes accompanied by mortification in the toes, fingers, nose, cheeks, lips, &c.* Sometimes the latter periods of the disease are attended with groaning and uneasiness, proceeding from excoriation, retention of urine, or mortification of parts laid upon; it is necessary to discover the cause, otherwise the patient often falls a victim, or it retards completely his recovery.'† The duration of the disease varies from two to three, or even four weeks; when, unless some favourable change or crisis takes place, the countenance collapses, the features shrink, the eye loses its lustre, the pulse sinks; and hiccup, rattling in the throat, coldness of the extremities, and profuse clammy sweats, with a cadaverous odour of the body, indicate the approach of death.

Such are the leading characters of typhous fever. When only the mildest of these symptoms are present, the disease is called *typhus mitior*. When the same symptoms occur, but in their highest state of intensity, and when to them are added such as denote *malignancy*, the disorder then assumes the character, and with it the name of *typhus gravior*.

OF FEVER COMPLICATED WITH LOCAL AFFECTION.

From the detail of symptoms which has been now given, it is obvious that inflammatory and typhoid fever, however they may differ in some points, yet agree in affording evidence of deranged function in every organ of the body,—the brain, the heart, the lungs, the stomach and bowels, the liver, the kidneys and the skin. Cases both of inflammatory and of typhus fever have been observed, which follow the progress I have now attempted to describe, implicating equally every organ and function. These are cases of *simple* fever, but they are comparatively rare. It is much more common to see one or other of these organs particularly affected. What the circumstances are which direct the violence of the febrile action upon one organ or structure in preference to another, does not always appear, but it can sometimes be satisfactorily explained.

CAUSES OF SUCH COMPLICATION.

Peculiar conformations of body, hereditary predispositions, or the weakening of parts by previous diseases, have a decided influ-

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* Philip, p. 183-4, vol. i. † Ibid. p. 186-7.

ence. A stout young man, with a short neck, and of a full habit of body, if attacked by fever, will be more likely, *cæteris paribus*, to have symptoms denoting determination to the head, than a tall thin young man, with a narraw chest, and subject to cough. The latter, during the progress of fever, may very probably have difficult breathing, with pain of side, and purulent expectoration. Much may be attributed also to the influence of climate and season; heat favouring the disposition to abdominal, and cold to thoracic affections.

But it must be confessed there is something more than this required to account for the phenomenon. What the exact pathological principle is, upon which it depends, has not indeed been hitherto explained, although some attempts towards elucidating it have been made. It appears, from numerous observations, that various states of disease of the brain and its coverings, both acute and chronic, such as blows on the head, fractures of the cranium, lacerations of the dura mater, tumours and abscesses within the substance of the brain, are not unfrequently attended by disease of distant organs; such disease being attributable simply to a state of disordered circulation in the encephalon, and disturbance in the functions of the brain. To the same cause, whatever be its precise nature, we refer many of those local affections with which fever is so frequently complicated.

OF THE ORGANS AND STRUCTURES AFFECTED IN THE COURSE OF THE FEVER.

It is a point of some importance to determine what the organs and structures are, most liable to become affected in the course of fever, what is the nature of these local affections, and at what periods of the fever they chiefly occur.

1. Of the organs liable to become more particularly implicated in fever, the most important is the brain. The symptoms by which we judge of this having taken place, are those which we shall hereafter describe when treating of phrenitis and apoplexy. The second in point of importance is the mucous membrane of the stomach and bowels. The symptoms denoting a particular affection of this structure, are usually now called the *gastric symptoms*. They are, pain in the epigastrium, nausea, and vomiting, a sense of fulness in the bowels, diarrhœa or dysentery. The liver may next be mentioned as liable to suffer in the course of fever. It is not observed to any great extent in this country, but it is very commonly met with in hot climates, and gives a character to the endemic fevers of those regions.

The pleura and peritonæum are occasionally attacked; but next to affections of the head, by far the most frequent of all the local complications with fever, is disease of the mucous membrane of

the bronchia, appearing in the form of cough, difficult breathing, increased expectoration, and general diffused pain over the chest.*

NATURE OF THE LOCAL AFFECTIONS.

2. Much controversy has taken place regarding the nature of the affection, under which the different organs labour when attacked in the course of fever. Dr. Clutterbuck, who urged the importance of these local determinations in fever, believed that it was inflammation; and seeing how much more frequently the brain was affected, than any other part of the body, maintained that continued fever was essentially inflammation of the brain. Others have argued, that in a large proportion of cases, the vessels of the affected part are in a state, not of inflammation, but of distention, or *congestion.* A distinction has even been attempted between *inflammatory typhus*, in which the seat of disease in the system of arterial vessels, and *congestive typhus*, in which the branches of the venous system are concerned. It has been supposed that this distinction between the inflammatory action of arterial capillaries, and the congestion of blood in veins, explains the diversities of morbid appearances found after death, and may serve as a guide in directing us to the proper methods of treatment. Now allowing the possibility of such a state of congestion in the venous system as this (which, however, is very problematical,) it still remains to be shown, that it may not, and does not run into the other. Until this is done, we cannot attach any great degree of pathological or practical importance to the distinction. The appearances on dissection in those who die of fever sufficiently point out, that danger is chiefly to be apprehended from the occurrence of inflammation; and that against such a state, the measures of the physician are to be directed, when he has evidence of local disease complicated with continued fever.

MORBID APPEARANCES FROM CONTINUED FEVER.

Morbid anatomy, it must be confessed, throws but little light on the pathology or *nature* of fever; but it points out its *effects*, and illustrates in particular those local affections which we have mentioned as so often coupled with fever. The most common morbid appearance in cases of fever, is a gelatinous effusion upon the surface of the arachnoid membrane; abscesses in the brain, filled with pus or a serous fluid; inflammation of different parts of the brain. Serum is sometimes found in the ventricles; besides which, we perceive in many instances, a fulness of the vessels of the brain, as

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* Dr. Crampton, in an essay, entitled "Medical Report, containing a brief account of the late Epidemic in Dublin," has given (page 48) an estimate of the relative proportions in which different organs were there pressed in fever. Out of 755 cases, 550 complained of the head, 129 of the chest, and 76 of the abdomen.

if they had been subjected to anatomical injection. Occasionally we meet with extravasations of blood, or the deposition of purulent matter. In the thorax we find marks of inflamed pleura. Pus is sometimes effused into the cavity of that membrane. In the abdomen there are occasional evidences of peritonæal inflammation; but the most usual appearance is that of ulceration, more or less extensive, of the mucous coat of the intestines. Inflammation in all its stages appears in the different organs of the body.

PERIOD OF FEVER AT WHICH LOCAL DETERMINATIONS TAKE PLACE.

3. The last topic to which I proposed to advert in this division of the subject, was the period of fever at which these local determinations are most usually observed to take place. In a few cases it is at the very onset of the disease; and this circumstance is important, as leading to the distinction between the states of *oppression* and *collapse*. The attack of fever is always attended by weakness; but if the blood be at that period particularly determined to the brain, a state of apparently extreme debility is brought on, which has often intimidated the practitioner, and prevented the adoption of those decisive measures which might then be *safely* had recourse to, and which alone could ensure a favourable termination. In a large proportion of cases where great weakness attends the *onset* of the disease, the symptom is to be attributed to a load oppressing the brain, to a state of oppression, and not of weakness, exhaustion, or, as it is called *collapse*. Local congestions, however, take place in the progress of fever more frequently than at its commencement. They have even occurred when the febrile symptoms have subsided, and the patient been considered convalescent. To decide, whether the symptoms which then supervene are referable to a state of oppression or collapse, is one of the most difficult points in the practice of physic. It can be effected only by a close attention to particular symptoms. The pulse is for the most part the safest guide; but the appearance of the countenance, the position of the body, and other minutiæ which *clinical* observation can alone teach, assist materially in the decision of the question.

PRINCIPLES OF PROGNOSIS.

The judgment of the physician regarding the probable course, duration, and termination of any particular case, is founded, in a great measure, on the observation of *symptoms*. This, in medical language, is the *prognosis;* and the principles by which it is regulated apply to a certain extent, to all diseases.

1. There is, in the first place, a *general prognosis*, founded on an extensive view of disease, which enables us to give an opinion regarding the probable course of particular cases, without any minute attention to symptoms. Thus, we can confidently predict, that a

case of catarrh, or sore throat, will end favourably; that a case of acute rheumatism will prove tedious; a case of croup, hazardous; of consumption, hopeless. In treating of diseases in detail, some allusion to general prognosis will always be made.

2. There is a prognosis applicable only to individual cases, and this is to be regulated by an attention to a number of minute circumstances, in detecting which, and estimating their relative importance, the skill of the physician is eminently displayed. This part of his duty can be but imperfectly taught in books. It is generally said to be guided by the presence or absence of certain *symptoms*, which are set down under the heads of *favourable* and *unfavourable* symptoms. These have been collected together with great industry by various authors, but taken singly they are not of that consequence which might have been imagined. It is impossible, indeed, to lay down with strict accuracy the rules of prognosis. In actual practice, it is commonly determined by several considerations of a *general* nature; and of these, it will be found that one of the most important, is the period of the disease at which a particular symptom occurs. To be able to draw legitimate conclusions, therefore, with reference to prognosis, from the observation of such a symptom, it is necessary to be well acquainted with the usual train in which the phenomena of the disease manifest themselves, and the causes upon which each depends. The age and habits of the patient; the circumstances in which he is placed; the period of time which has elapsed before medical treatment is resorted to, and the possibility of employing medicines effectually, have also a most important influence over the course and probable termination of the disease. They must all, therefore, be taken into consideration in determining the prognosis; but they are obviously much too indefinite for particular investigation.

OF MALIGNANCY AND PUTRESCENCY.

The *symptoms* which denote danger in continued fever are those, first, of excessive inflammatory excitement;* secondly, of topical congestion; and, thirdly, of great depression, or irregular action of the nervous power. Among the latter are included those which the older writers were in the habit of designating as the symptoms of *malignancy and putrescency*, state of body, the notion of which has been, in latter times, the frequent subject

* To give some instances, the red and turgid face; the throbbing, quick, full, tense or hard pulse; immoderate and unquenchable thirst; indifference to liquids with a dry tongue, and great heat internally; sleep without refreshment; urine pale and clear; a dry, fiery, pungently hot skin, and delirium during the intervals continuing in spite of the remedies; a frequent hurried breathing and deep sighing. On the contrary, the abatement of these symptoms; the pulse becoming softer and slower; the skin of a natural temperature, moist, cool, and soft; a smooth white tongue; countenance cheerful; return of appetite; the urine depositing a brickdust coloured sediment, are favourable; bleeding from the nose, diarrhœa, or abscesses, are so likewise. C.

of dispute. That the powers of the living body, in checking the putrescent tendency of all the animal matter, should be diminished in certain states of disease, does not, however, appear to be an unreasonable supposition. The following may be enumerated as the chief symptoms which denote *malignancy* and the putrescent diathesis. A loose or very imperfect coagulation of the blood—fœtor of the evacuations—a squalid appearance and excessive coldness of the skin, and a cadaverous odour of the body—hæmorrhages from the mouth, nose, stomach, rectum, or urethra; the blood being of a very loose texture, and quickly putrefying—petechiæ and vibices—a disposition to gangrene in the skin, wherever it has been accidentally wounded, or abraded, or exposed to long pressure—the speedy putrefaction of the body after death. It would be necessary to clear up many of the difficulties in which the doctrine of the coagulation of blood is involved, before we could arrive at a satisfactory explanation of these phenomena; but in the mean time there are sufficient grounds for believing, that malignancy and putrescency in acute diseases, depend principally upon the functions of the brain becoming *early* and *deeply* implicated.

It may further be stated that in common typhus, a dilated pupil, a glassy, inflamed, or staring eye; ichorous, involuntary or cadaverous, smelling evacuations; hiccough; cold, clammy, and partial sweats, with a small, weak, creeping, and tremulous pulse; with anxiety, restlessness, and a greasy colour of the face, or a sad expression; low muttering, or high delirium; starting of the tendons; quick speech; voice altered; constant watchfulness, with incoherence; stern sullenness, or unmanageable fury of mind; picking of the bed clothes; blindness; inability to put out the tongue; difficult deglutition; sliding down in the bed; lying on the back; drawing up the knees; insensibility, with a disposition to uncover the breast; or frequent attempts to get out of bed, denote the approach of death. C.

FAVOURABLE SYMPTOMS.

A variety of symptoms are mentioned by writers on continued fever, as favourable; such as deafness; "the pulse rising; becoming slower, softer, and stronger, the breathing easier and calmer, with a natural tongue; eruptions about the mouth; tumors behind the ears, miliary eruptions," diarrhœa, sediments in the urine, the breaking out of a sweat, natural state of the skin, or excessively cold state of it, with a full pulse, or a great sweat with the same state of the pulse, the pulse rising after stimulants, with an abatement of the stupor, tremor, &c. and the formation of abscesses. Upon the latter, much stress has been laid. They have been considered as *critical* discharges, that is to say, as serving to carry off noxious humours generated during the fever. This point of doctrine we do not now insist upon; and upon the whole it may be remarked, that there is no single symptom occurring in the course of fever, which can be set down as decidedly favourable; but that the probability of recovery must always be estimated by the character of the symptoms, when viewed in connexion with each other.

AVERAGE MORTALITY.

The *general* prognosis in continued fever is certainly favourable. Under proper management, a large proportion of cases recover. This is a point which has been made an object of inquiry by different writers; and a very curious coincidence has been traced in the extent of mortality occasioned by continued fever, under circumstances considerably different.* The average of deaths in the hospitals of this country appears to be in the ratio of about one to twelve, which is believed to be considerably *below* the ordinary scale of the mortality of fever, when it occurs in private habitations, even with access to medical assistance. It varies of course with the general character of the epidemic, the period of the disease at which it is first submitted to medical treatment, and other circumstances of nearly equal importance, the influence of which has been already adverted to.†

The following remarks from Philips' treatise, will throw some light on the nature of the prognosis:

The urine has always been examined with the view of determining the state of the fever: From the latest observations it is determined, that sediments are found even in the healthy state of that fluid, and that certain circumstances determine their appearance, in a greater degree about the termination of fevers. The deposit from the urine is either red, consisting principally of the lithic, or as it is now called, the uric acid; or it appears in the form of a cream-coloured or furfuraceons deposit; now and then, however, assuming more or less of a pink colour. The first, or the red (uric acid) deposit, is most copious when the diet is acescent; when the state of the digestive powers is debilitated; when there is much acidity in the primæ viæ; or, when the perspiration is checked, and the acidity which should have passed by the skin is thrown upon the kidneys. During fever, when the perspiration is checked, and the kidneys are debilitated, so that the acid is thrown off by neither of these emunctories, it accumulates in the system; and when by a change in the disease the functions of the kidneys return, a large deposit of this matter takes place, and in this manner becomes an evidence of the return of health.

The cream-coloured or branny sediment, is the result of an alkalescent diet, or of an unusually free perspiration, which passes off the acid by the skin. This sediment, like the one first mentioned, only proves a healthy disposition in the vessels of the skin to perspire, and thus throw off the acid which permits the deposit to be made in the urine.‡

The same effects are produced by sudorifics; Philip says that he could at any time produce a deposit in the urine, by exciting a perspiration with Dovers' powder. He also observes that, as this is the invariable result of an increase of perspiration, there can be no doubt these appearances in the urine are not the causes but the consequence of recovery.§

Sweating is the most general mode by which fevers terminate, particularly intermittents and remittents; and it is certain, that the best effects are produced by general and long continued sweats, if the patient, notwithstanding, retain his strength. Sometimes it continues for days and nights, and terminates in health;‖ it is necessary, however, to keep up the strength, otherwise the patient would be exhausted. Regarding this evacuation as the consequence and not the cause of

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* Consult Bateman's "Succinct Account of the Contagious Fever of this Country." London, 1818. Page 75.

† See pages 59, 60, 61, 62, 63.

‡ Philip, vol. i. p. 189—90.

§ Ibid, p. 190.

‖ Ibid, vol. i. 191.

recovery, its discharge is to be promoted only so far as is consistent with the strength of the patient. The unnatural means used by heating medicines and warm clothing to keep up the perspiration, has destroyed many lives. It is only when sweating relieves the symptoms that it is to be encouraged, and that only by gentle and mild means. This symptom, however, is sometimes not critical; thus, in the yellow fever excessive sweats have been observed to be pernicious. In the sweating sickness, which appeared in England, it was a principal and a fatal symptom. The same observations apply to diarrhœa, hemorrhagy, as to the discharges of urine and sweat. When they are excessive and debilitating, they destroy life instead of relieving the disease, and it is only when the evacuation is attended with an evident abatement of the disease, that they are useful. In ardent and inflammatory fevers, hemorrhagy is particularly useful, and often critical. This is true of the synocha of temperate latitudes, where a sufficient quantity of blood flows to cure the disease; in causus or yellow fever, however, bleeding from the nose has been considered as a mortal symptom; for it shows an extreme degree of inflammation of the brain, which the discharge is not sufficient to relieve. The physician can do much, when symptoms of hemorrhagy appear in any part, by drawing blood and assisting nature in her efforts. The symptoms which generally precede it, are pain, heat, and tension in the parts from which the blood is to flow. In general the discharge takes place from the nose; an unusual redness of the eyes; an increased secretion of tears; a sense of weight in the temples, throbbing, dimness of sight, itching of the nose, and the pulsus dicrotus, each stroke of which consists of one long, immediately after succeeded by a short beat, portend its appearance; those causes of fever which increase the power of the system, or its plethora, are most likely to end in critical hemorrhagy; these are excessive eating, drinking spiritous liquors, or suppressed discharges.*

A scabby eruption appearing about the lips, or behind the ears; an increased secretion of mucus from the throat, or of saliva, with aphthæ; are often critical; the latter, when light-coloured and attended with a flow of saliva, are often favourable; when they are not accompanied with a flow of saliva, and are dark coloured, they are symptoms of danger.† The suppuration of the glands, particularly the parotid, are often favourable. The experience of authors differs much upon the propriety of opening these swellings. Pringle and Farquhar advise the opening of the parotid as soon as it showed a disposition to suppurate; Acrel, however, found the strength to sink soon after the abscess was opened. The balance of authority is on the side of laying the abscess freely open, as soon as it is discovered. The armpits, groin, and testicles are their most common seats.‡

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* Philip, p. 195, vol. i. † Ibid, p. 196. ‡ Ibid, p. 198.

CHAPTER III.

CAUSES OF CONTINUED FEVER.

Exciting causes of Continued Fever—Of Cold as the cause of disease in general—Of Fever in particular—Alternations of atmospheric temperature—Of Contagion—First accounts of Contagion—General doctrines of Contagion—Of Fomites—Other supposed causes of Fever.

EXCITING CAUSES OF CONTINUED FEVER.

It was stated, in the first chapter (page 49,) that the exciting cause of continued fever admitted of a division into the two great classes of *common* and *specific*. The first of these, "such as cold, excesses in eating and drinking, sudden changes of weather," are, in a measure, obvious to our senses; and their operation is, to a certain degree intelligible. The second, as contagion, &c. are more recondite in their nature, and their mode of operation is very obscure, if not altogether inscrutable. Another well-marked line of distinction between them may be drawn from the circumstance of the first, or the common causes of fever, inducing this state of disease *rapidly*, while the latter require a certain, and generally a defined length of time, before their influence is apparent. Feverishness suddenly brought on by any of the more common kinds of irritation, is, for the most part, transient in its course, and has accordingly received from nosologists the name of *Ephemera*.

OF COLD, AS THE CAUSE OF DISEASE IN GENERAL, &c.

Any irritating causes are capable of engendering fever in the human body; but this they will more particularly do, when the frame is *predisposed* to fever, either by peculiarity of temperament and habit, or by the state of the mind and nervous system, or by certain conditions of the air. Those which are most frequently observed to operate as exciting causes of fever, are, external injuries, the presence of worms, difficult dentition, an overloaded stomach, the free use of wine or distilled spirits, excessive

fatigue, insolation (or exposure to the direct rays of the sun), long watching, or long protracted pain. Of all the common causes of continued fever, however, the most frequent is *cold;* and as cold will hereafter be mentioned, as an occasional cause of several other diseases, besides fever, both acute and chronic, we shall direct our attention in a more particular manner to this branch of the subject.

It becomes, in the first place, a matter of some importance to determine, in what manner cold is to be considered as the cause of disease, and particularly of febrile disease. The simple diminution of temperature seems to give a predisposition to some forms of chronic disease, particularly scrofula, but its effect is never fever. We are constituted so as to bear extremes either of heat or cold for a long time, without suffering in our health. But though cold applied to the body under common circumstances does not create fever, the case is widely different when it is applied suddenly, or partially, or irregularly, or when the body is overheated and perspiring profusely, either from the nature of the climate, or from great exertion, or exposure to artificial heat. The importance of the function of perspiration, in regulating the uniformity of animal heat, and the actions of other organs, is well known to the physiologist, and is illustrated by him in various ways. It seems probable that it is through the medium of this function that cold operates in the production of fever. It closes the pores, checks perspiration, and drives the blood in increased quantity upon the internal organs. When we look to the vast *extent* of the skin, and reflect on the immense quantity of blood with which it is supplied, it is not difficult to understand that this disturbance in the operations of the animal economy should be occasionally productive of bad effects, and experience shows that of these the most usual is *fever.*

When once fever is excited, it may assume different appearances. In many cases the mischief falls upon some particular organ of the body, the tonsils, the lungs, the liver, the bowels, or the joints; and is directed upon them, sometimes without any apparent cause, at other times in consequence of some cognizable circumstance, such, for instance, as weakness in the structure of the organ, or a liability brought on by previous disease. This is an important law of the animal economy, which serves to explain many points in pathology, and which, therefore, will be frequently referred to. There are few constitutions indeed which have not some one organ more disposed to disease than another. Original conformation, age, mode of life, habits, diet, climate, and season, and the disposition left by previous disorders, with many others, contribute to this, and it is one great source of the varieties of disease. According to the constitution then of the individual, will in many cases be the result of exposure to cold. When the general disturbance of all the functions of the body takes place, cold is said to generate *idiopathic fever.*

ALTERNATION OF ATMOSPHERIC TEMPERATURE.

Closely allied to cold in the mode of its operation is *sudden alternation of atmospheric temperature.* This has been observed in all countries to be a fruitful source of febrile diseases, and of none more than continued fever. Nowhere is it better exemplified than in this country, so remarkable for the unsteadiness of its climate, which in the course of four-and-twenty hours not unfrequently exhibits the succession of the four seasons. These sudden changes of atmospheric temperature are particularly favourable to the production of fever, and are, *per se*, capable of exciting it. In this way we account for the greater comparative frequency of continued fevers, hæmoptysis, and inflammatory affections of various kinds, in spring and autumn, than at any other period of the year.

A diminished temperature as an agent in producing disease, is regulated by several circumstances. When it descends below 55° or 60°, it will produce disease, according to certain circumstances, more or less readily; these regard, first, the power of the cause itself: second, the power of the constitution, which resists the morbific agent.

1. The power of the cold itself may be increased, by being applied suddenly, as in a sudden cold wind, or plunging suddenly into cold water; by being applied to a part of the body when it is kept generally warm; by being applied by moisture united with a current of air; by sudden and great alternations of temperature.*

2. The power of the constitution which resists the morbific agent, may be diminished by any cause, which increases the weakness of the system; thus, the patient may be weak naturally; or, he may be debilitated by excesses; as, by bleeding, purges, low diet, intemperance, fatigue, or gluttony; the body being in a perspiration, and deprived of its accustomed coverings. The truth of these causes is demonstrated from the fact that their opposites,† a strong constitution, exercise, wholesome food, pure air, a contented mind, give a vigour to the constitution which enables it to resist all attacks. Cold acting in this mode, produces fevers of an inflammatory character; as, rheumatism and pleurisy, &c. palsy of the muscles, most probably from the inflammation of the nerves, which go to them; local inflammation, as, in chilblains and gangrene.‡ It also produces apoplexy, and it is, in general, from this cause, that persons, who die from intense cold go off. C.

OF CONTAGION.

Continued fever, however, has another and a very important exciting cause, which frequently operates where neither cold nor alternations of atmospheric temperature can be suspected, as where fevers attack persons shut up in close rooms with others labouring under the disease. When fever appears under such circumstances, it is said to have its origin in *contagion.* A number of the most important doctrines of the science of pathology are closely associated with the subject of contagion. From the earliest periods at which it became an object of inquiry, this has been acknowledged; but the investigation is obscure and difficult, and has proved a source of endless controversy. Many of the disputed points in

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* Cullen's First Lines. † Ibid. ‡ Ibid.

medicine are interesting only to the man of science; but the doctrines of contagion are of general interest, because involving practical considerations of the highest importance. Without attempting to clear up all the difficulties in the way of the inquiry, I shall be satisfied with a brief enumeration of its leading positions, and of the principal points in dispute.

FIRST ACCOUNTS OF CONTAGION.

1. Attempts have been made to throw discredit upon the doctrine of contagion as the cause of fever, by showing that it was for a long time either unknown to, or disregarded by physicians. It is certainly a curious fact, that for the first dawnings of information concerning it, we are indebted, not to Hippocrates or Galen, but to ancient poets and historians. Thucidydes, in his account of the epidemic fever or plague that raged in Athens during the Peloponnesian war, shows that he understood contagion in the sense in which we now use the term;—noxious matter from one morbid body producing a similar disease in another. In Plutarch's Life of Pericles we read, that whilst that commander was laying siege to the city of Epidaurus, a distemper prevailed in his army, which not only carried off his own men, but *all that had intercourse with them.* Livy, in the account of a camp fever which affected the armies of the Romans and Carthaginians at the siege of Syracuse, distinctly states that it was propagated by contagion. Virgil and Lucretius employ the term *contagion* to express the manner in which a disease of sheep spread among the flock.

Medical writers were for the most part, very inattentive to contagion until the time of Sydenham, in whose work (sect. ii. chap. 2.) a distinct reference to contagion may be met with. Boerhaave and the followers of his school were very incredulous on the subject of contagion. Their ideas about it too were imperfect and confused, from the circumstance of their blending the notion of contagion with that of marsh miasmata. Dr. Huxham, Dr. Lind, and Sir John Pringle, are the great original writers on contagion, particularly on that of continued fever. Since their time the subject has undergone the most rigid examination, and as we have said has given rise to the most discordant opinions.

GENERAL DOCTRINES OF CONTAGION.

2. Much confusion has been introduced into the subject of contagion, by the employment of the term *infection*, and by the different acceptations in which contagion and infection have been taken.*

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* See "Evidence taken before a Committee of the House of Commons, appointed to inquire into the validity of the Doctrine of Contagion in Plague."—1819.

This has been increased by the want of a proper distinction between common contagion and specific contagion. Diseases which cannot be produced in any other way than by contagion, are said to have their origin in *specific contagion.* Of this kind are small-pox, cow-pox, measles, the plague, hydrophobia, and syphilis. Diseases which, occasionally produced by contagion, are yet sometimes owing to the operation of other causes, are said to arise from *common contagion.* Of this kind are catarrh, cynanche, parotidæa, erysipelas, ophthalmia, typhus, and scarlatina. The laws of common and specific contagion are in many respects similar, but they have also their points of difference. To illustrate these, and to determine the peculiarities of each individual contagion, will be an important object in future parts of the work.

3. In the last paragraph I have assumed as an established principle what has been, and what is still made the subject of keen dispute; viz. that typhus fever does originate from contagion, and that it is of the kind which we have called *common*, in opposition to specific contagion. Both these points have been called into question. By a few, and happily a very few, it has been contended, that the notion of a contagious origin of typhus fever is altogether unwarranted; but the views of these *anti-contagionists* are so completely at variance with the generally received opinions of medical men, and so irreconcileable with facts obvious to all mankind, that any formal refutation of them is unnecessary. On the other hand, there have been, and there continue to be, physicians who believe in the *exclusive* origin of typhus from contagion, who maintain that no disease can propagate itself by contagion which had not its own origin in contagion; in other words who deny that common continued fever, under any, the most adverse circumstances, can ever spread by contagion. This opinion involves the difficult, but for the most part idle question, how contagious fevers ever originated; but setting this aside, it may fairly be argued that it is neither borne out by observation nor by reasoning. There is nothing improbable in the supposition, that what originated in cold may be afterwards propagated by contagion. It violates no established law of the animal œconomy. Experience on the other hand appears to favour it; and it may therefore be laid down as an important practical principle, that fever which originated in the first instance from *common* causes, may under certain circumstances, either of local situation or constitution of body, spread by contagion.* What those particular circumstances are, which thus concur to favour the developement of febrile contagion, may be anticipated from remarks already offered. The principal of them are, crowded and ill-ventilated apartments, want of cleanliness and comfort, and

* This view of the question is now generally known by the name of the *doctrine of contingent contagion*, and it has received the support of the most able cotemporary pathologists.

previous weakness of the affected individual, whether owing to excessive fatigue, or an unwholesome or scanty diet.

Whatever debilitates the mind or body is to be avoided; as the weakness of either leads to the developement of fever when the contagion has been received. Sudden fear, horror, joy, or the excitement of any strong passion, particularly contributes to it. Intoxication, fatigue, night watching, gluttony, intense study, exposure to the sun, so as to fatigue, are all dangerous; and if debility is produced, it is necessary to obviate it immediately, otherwise the fever will appear.

Chewing opium and tobacco to those who are accustomed to them are proper, as they will keep up the strength to its usual height; but to those who are not accustomed to them, they must be considered as sources of debility; as to the use of tobacco as a preventive of the access of the poison to the stomach, it is an idle precaution, since the lungs must be considered as the great avenue through which the miasmata enter the system.

Mercury and issues have all been advised; and with regard to the former certainly with some reason, since it cures the fever, when it is already formed, though in some few instances, fever may continue during a salivation; these, however, are rare. Issues might be used at the same time with a salivation. Purges have also a good effect, but more particularly in preventing bilious and the yellow fever. With regard to the use of camphor hung round the neck, of mercury put into a quill, and other contrivances of this kind, they are to be considered as fancies, and of no practical use.*

The general use of such diet, exercise and modes of life, as are best consistent with strength, is the great mean by which prevention is to be effected; thus the use of digestible food, as mutton, beef, and fowls broiled, regular exercise in the open air for several hours, at the same time avoiding the sun and the morning or evening air, more particularly in warm seasons and latitudes, an easy, equable mind, freedom from care, and all the depressing passions; to avoid exposure to the contagion, or if that is impossible, to be greatly exposed to it, as habit weakens its effect, will all deserve attention: The sleep should be regular, as the want of it frequently brings the contagion into operation.

The separation of the sick from the well, in houses appropriated for that purpose, is one of the most effectual modes of arresting contagion, and after it has taken place, proper nursing to conduct them through it; thus, to attend a person in the yellow fever, an African or West India negro will be less likely to be endangered by it, or be interrupted with improper fears in their duties, and a person who has lived in a filthy suburb of a city will be most proper to attend typhous patients. Persons from a high cold situation or latitude are not proper nurses for the diseases of summer, or in low latitudes. The acclimated, those who are not afraid of the disease, the temperate, and those of a sound constitution, are the best persons for nurses; it is particularly necessary that these cautions should be attended to, as frequent death among the attendants may spread the alarm and render it difficult to procure the necessary comforts for the sick.

The use of the Peruvian bark and other bitters has a fine effect in preventing fevers, particularly of the remittent and intermitting kind; and as it has great power in keeping up the strength, it is in every respect a valuable aid in fevers of all kinds. Its use was tested in Hungary during one of the campaigns of Austria in that country. The retinue of a certain count was completely protected from the ague by the bark, whilst the army generally without this precaution was obliged to remove on account of the prevalence of the fever. C.

4. Many of the controverted points in the doctrine of contagion hinge upon this question; but there is another fundamental one, of almost equal importance. Sydenham long ago urged it with much force of argument, and a due attention to his observations might have prevented much of the controversy which has lately taken

* Philip, p. 231.

place on the subject of the plague and yellow fever:—I mean that particular constitution of the atmosphere, which disposes to, or which checks, the *diffusion* of all febrile contagions, whether common or specific. It is well ascertained, that a contagious disease, even of the most malignant kind, which may have gained footing in a populous city or district, does not necessarily attack every one within its sphere, or go on progressively to the destruction of all the inhabitants. Several circumstances contribute to this; first, peculiarities of constitution, which secure certain individuals *completely* from the influence of the contagion; and, secondly, the immunity from future attacks, which in several instances of febrile contagious disease is afforded by once undergoing it. To this last law of contagion, we shall have occasion to refer more particularly, when the eruptive fevers come under consideration; but for the present it may be stated, that it applies, although with some exceptions, to typhus fever. These two circumstances assist in explaining the fact just mentioned, but they are not *fully* adequate to the effect. A certain constitution of the air, therefore, sometimes favouring, but sometimes checking the diffusion of contagion, must be admitted as a third general principle upon which it depends.

Some physicians have pretended to find fault with this multiplication of causes for explaining a single phenomenon, and have argued that a peculiar, or, as Sydenham says, an *epidemic constitution* of the air, is of itself capable of explaining what others refer to the combined operation of it, and of the principle of contagion. As well might they argue, that the tree could be reared without a seed, because a peculiar condition of the soil is required for its reception and growth. Several of the most important facts in the histories of great epidemics, particularly the plague, will hereafter be illustrated by a reference to the foregoing fundamental doctrines in the laws of contagion.

5. Much speculation has taken place among medical authors, regarding the mode in which contagion produces its effects on the animal œconomy. It has been observed of a number of diseases notoriously arising from contagion, that they exhibit, even from an early period, symptoms of great depression of nervous energy, or of *collapse*. This is exemplified in the case of plague, typhus, cynanche maligna, influenza, erysipelas; and it has hence been imagined, that there is in the nature of contagion something which is directly *sedative* or depressing to the nervous energy. A more extended view of disease would show the fallacy of this as a general principle. Measles and ophthalmia, which yet exhibit all the marks of genuine inflammatory *excitement*, are diseases, as obviously arising from contagion, as plague or typhus. The operation of contagion may possibly be upon the brain and nerves, but its precise effect upon them is altogether inscrutable. Still, while I offer a caution against assuming as a principle of pathology any thing

sedative in the nature of contagion, I am not insensible to the importance of the fact, that cases of disease arising from *common* contagion, above all continued fevers, are more likely to be of the low or typhoid kind, than such as are attributable to cold, or other causes independent of contagion.

6. Of the intimate nature of the contagious particles which arise from morbid bodies, and which produce a like disease in others, we know nothing; but there are a few particulars known or conjectured regarding the *manner* in which their influence is exerted on the animal œconomy, which it will be proper to notice.

7. Great attention has been paid by Dr. Haygarth and others, to determine the *distance* to which the noxious effluvia extend, and at which they operate in exciting disease. There is reason to believe that this varies in different cases, and that the plague, typhus, and small-pox, have, in this respect, each their several laws. The subject, however, does not appear to have been yet investigated with sufficient accuracy, to enable us to lay down any established points of doctrine with regard to it. It is not exactly known, how far the sphere of contagious influence is affected by ventilation. In the case of *continued fever*, we are warranted in saying, that a free circulation of a pure and cool air renders the contagious particles comparatively inert, and that *concentration* is nearly, if not altogether, indispensable to the activity of contagion.*

It may be conveyed by the wind. This was proved by the fact that some prisoners in London, after living in close, badly ventilated apartments, communicated the disease to those members of the court, upon whom the wind, from a window, blew in a direction from the prisoners, whilst others who were not exposed to the impregnated blast escaped.†

All those circumstances favour the effect of contagion, which favour its increase and accumulation; as a stagnant air. In Vienna there was a calm for three months; during that time, the plague raged; on the rising of a wind, the disease was mitigated.‡

A warm and moist air, as it favours putrefaction also favours the spread of contagion; thus the plague spreads more readily in damp and foggy, than in dry and clear weather. The debility produced by dampness may also contribute. The stools produce most readily the disease; the breath next; and next the perspiration.§

The contagious matter is very indestructible. Mead states that the smoke of the burning clothes of the sick has produced infection. C.

Some physicians have extended their views farther, and have maintained that there are certain chemical substances which have the power of decomposing contagious effluvia, or, at least, of rendering them, in some way or other, innoxious. Of these, the principal are acid vapours, particularly those of the nitric "muriatic," acetic acids, and chlorine. *Fumigation* therefore has been recommended as a powerful means of counteracting contagion. The theory upon which it has been introduced is exceedingly doubtful, and the prac-

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* On this subject consult "Facts and Observations regarding Infection," by Sir G. Blane. "*Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge.*"—Vol. III. page 425.

† Philip, vol. i. p. 213. ‡ Ibid. p. 214. § Ibid. p. 216.

tice far from being generally applicable, acid vapours of all kinds being more or less injurious to breathing. If fumigation is adopted as a substitute for thorough ventilation, it may prove injurious; if only superadded, it is perhaps superfluous; but on a point of such *practical* importance it is right to speak with much caution.

The nitric acid may be made by adding some nitre to heated sulphuric acid in cups placed at the distance of 20 or 30 feet from each other; the muriatic acid is prepared by heating common salt moistened with sulphuric acid; the oxymuriatic or chlorine is made in the following manner:

Mix an ounce of a mixture made of equal parts of powdered manganese and common salt, add a tea-spoonful of water and half a tea-spoonful of sulphuric acid from time to time, and thus a constant supply of the gas will be furnished. It is particularly necessary not to inhale the fumes of this air in their concentrated state, as they produce consumption.

Sulphur burnt on coals is also used; it however affects the respiration, and therefore is improper. The acetic acid is used principally in the form of the aromatic vinegar; it is too limited in its operation; it is, besides, decomposed by throwing it upon coals, and in that mode, though commonly used, its virtues are entirely lost.

The uselessness of odoriferous fumes was shown by Guyton Morveau in the church at Dijon, which was highly infected by the effluvia of dead bodies; it concealed but did not alter the properties of the effluvium. Tar, Lind regards in the same light.* Morveau used the muriatic acid vapour in 1773 with good effect to disinfect the church, by filling it with its vapours. Guyton Morveau recommends the following mode of preparing the oxymuriatic acid: Pour about two and a half ounces of the nitrio-muriatic acid upon a drachm of the oxide of manganese in a four ounce bottle; the vapor will be immediately produced:† but it must be observed that it will be disengaged in great quantities, and may be dangerous if inspired. All metallic substances must be covered to prevent its effects. Lind says that clothes and other articles to which the matters of contagion may adhere, may be purified by baking them in an oven, or exposing them to the heat of a confined fire, which he says no infection can resist. C.

8. Attempts have been made to ascertain the exact period at which contagion begins to exert its influence; and it has been satisfactorily shown, that in this respect each particular contagion acknowledges a different law. The *latent period* of typhus (that is to say, the time which elapses between exposure to the contagion, and the first symptom of fever) is generally from ten days to a month, but it has been known to extend to six weeks, or even two months. Physicians have also attempted to determine at what particular period of a disease its contagion is the most active, and when the body ceases altogether to afford contagious matter. This point it would be of much importance to ascertain, as it would indicate when a patient might safely be permitted to mix in society; but unfortunately there do not appear to be sufficient data to enable us to decide the question with any degree of accuracy.

OF FOMITES.

9. The last subject of inquiry which the general doctrine of contagion offers, is the attachment of contagious particles to certain

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* Bateman, a Succinct Account, p. 103-4. Lond. 1818. † Ibid. p. 165-6-7.

bodies, thence called *Fomites*, where they lurk, often for a very long period of time, and subsequently renew the disease with all its former, or even with increased virulence. It is the most curious fact in the history of contagion, and one established upon the most unquestionable evidence. The principle too appears to be of more general application than any other which the doctrine of contagion involves. The plague and typhus, small-pox and scarlet fever, ophthalmia and porrigo, afford the most familiar illustrations of it; but it is doubtful if there is any species of contagious disease, which may not be communicated through the medium of fomites. They may be either hard or soft bodies. The walls and wainscoting of the room, beds and bed-furniture, the furniture of the room, and the clothes of the patient, are those against which we are chiefly to be on our guard. It is well ascertained, that the clothes of an individual, who is himself unsusceptible of the disease, may become the fomites of its contagion. In this manner typhus, small-pox, and plague, are not unfrequently disseminated.

From the continued accumulation of the matter of contagion in linen, cloth, or walls, &c. it appears, that it is often more dangerous than the body itself; upon this subject most authors agree. Lind supports the idea, and Smith states that the linen of the sick is more dangerous than even the dissection of the dead body. Wool and wood are the most apt to retain it.*

The poison of contagion may from habit not affect those who are constantly exposed to it; whilst their clothes may carry it and give it to others. This happens sometimes in courts, to which prisoners are brought from filthy prisons.

The intensity of the poison varies under different circumstances; it is much greater, when produced in the latter periods of the disease, when petechiæ, vibices, and cold cadaverous sweats occur.

Its effects also vary according to circumstances; thus a person who has the small-pox or the measles, will have a fever resembling that of those diseases respectively, but there will be no eruption; he may also have the typhous fever, and it may die away after it has continued for several days. He may have the infection in his system, and if he is exposed to no debilitating cause it will not appear; whereas, those who have been exposed to a debilitating cause, as excessive drinking, fatigue, will be taken with it immediately after the debility is produced. Those, who are recovering from a contagious disease, excepting those which arise from specific contagion, are more subject to a return on being exposed to the poison, which originally produced it.† C.

Such are the most important topics which the general doctrine of contagion embraces. They are brought forward in this place, because contagion, as a cause of continued fevers, demanded particular notice. It remains however for me to observe, that besides those exciting causes of continued fever which have now been mentioned, there are some others to which this form of disease has been attributed, which, at least, deserve to be enumerated. Of these the first is a vitiated state of the air, in consequence of the accumulation of persons in a confined space.

'Thus, some of the persons confined in the black hole of Calcutta were taken with this fever. Shutting down the hatchway produces

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* Phil. p. 216. † Ibid. p. 218-19.

it in ships; the poor in London take it from confinement in their dwellings during a scarcity of fuel, and when removed to the house of recovery soon improve from the purity of the air.'

The second is the putrefaction of animal and vegetable matters.

'Any putrefying matters may have the same effect: to this it has been objected that glue manufactories have diffused the most noisome stenches for miles, from the putrefaction of the materials, without affecting the health of the neighbourhood; but this is no objection, as in these instances the miasmata may not have been sufficiently concentrated; and as it appears that there have been diseases produced by the putrefaction of animals, as of the dead after a battle, of a whale in Holland, &c. there can be no doubt that animal putrefaction is sufficient to produce it.

'It would appear, that as there are certain parts of the system which nature has intended to be eliminated from it by the excretions, that these are particularly noxious, when confined about it and re-admitted into it; this is also the case with animals; thus sheep confined in great numbers in a ship generated a fever among them, which did not extend either to the crew, or to some hogs which were near them; after some time the hogs took sick with a fever, which also was entirely confined to them, proving evidently the power of the causes, which arise in every species, and that their operation is confined to the species itself. These animal substances which are excreted from the body of every animal, it is probable have more power; but if putrefying matter of any kind be of sufficient intensity, it will produce this fever, modified in its symptoms by the particular poison which produces it, but resembling this fever in its more general characters. Indeed typhus may follow any fever which is protracted, and which debilitates the patient sufficiently. It may therefore be considered as a state of the system when under fever, in which its actions are highly debilitated, and which may proceed from all causes which produce fever and debility. If it continue long enough, and the situation be sufficiently confined, the result is contagion in the same manner, (but with more power,) as any other putrefying matter will do.'

The third is a state of famine or scarcity The prevalence of fever at particular periods has been often attributed to one or other of these sources, and many occurrences in history favour the opinion. That they powerfully *contribute to the diffusion of fever* when once generated, cannot be questioned; but they have all been so frequently observed to exist without fever ensuing, that their power of *exciting*, *per se*, this state of disease, must still be considered among the doubtful points in medical science.

The rules of prevention may be gathered, from what has been said on the subject of the causes of typhus; removal of the sick from the sources of contagion; personal and domestic cleanliness; a residence in the upper stories of houses; ventilation; this may be effected during an epidemic by closing the doors and windows of the house, and kindling fires in several chimnies; the air will then descend through the others, as it cannot gain admission through the doors and

windows. Hospitals are sometimes ventilated in this manner; a passage for the air is opened through the upper parts of the windows, whilst fires are kindled towards the ends of the wards. The imperfection of this plan, however, has been proved, as it is stated, that birds die when placed on the floor of the ward, when they were in perfect health while placed in the upper parts of it. It is, therefore, necessary to ventilate them both from apertures near the ceiling and the floor.

The means which have been generally recommended for purifying the air, have but little power; thus the burning of large fires during the prevalence of an epidemic, has been found to be useless; excepting, perhaps, when it destroys dwellings which have been for a long time the receptacles of domestic filth; results confirmed by repeated experience.

Camphor, juniper, frequently applied to the nose, tobacco chewed, steams of vinegar diffused through the sick chamber, are all of doubtful efficacy. The acid vapours above mentioned are most to be depended upon; particularly the chlorine.*

With regard to purifying houses, hospitals, and ships, the mixture which produces the chlorine is to be placed in different parts of them, and the windows, chimneys, hatches, are to be shut, and thus the gas may be made to penetrate completely every part of them.

Furniture and clothes may be purified by exposure to the air, and washing. Clothes should be well aired before they are washed, to prevent infection on washing them; previous to which, they should also be soaked in soap and water, as the steam arising from infected clothes, is said to be dangerous.

Smoking clothes, ships and houses, which are infected, completely frees them from any infection. It has been customary since the infancy of medicine to use sulphur; arsenic has also been proposed for the same purpose; smoke answers very well; but the chlorine and other acids have superseded every thing else.†

Pitch, tar, rosin, cascarilla, camphor, juniper, pine tops and shavings, have also been used.‡ Wood and woollen articles should be dispensed with as much as possible. Iron bedsteads, and brick floors are most proper for hospitals. C.

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* Philip, p. 220–6. † Ibid. p. 228. ‡ Ibid. p. 228–9.

CHAPTER IV.

TREATMENT OF CONTINUED FEVER.

Necessity of Treatment in Fever—Indications of Cure—The antiphlogistic Regimen—Possibility of cutting short a Fever—Remarks on the different Means resorted to in the treatment of continued Fever—The Abstraction of Blood—Cold Affusion—Emetics—Saline and Antimonial Medicines—Purgatives—Cordials—Bark—Opiates—Blisters.

NECESSITY OF TREATMENT IN FEVER.

It is well remarked by Dr. Cullen, though in every fever which runs its full course, there is an effort of nature of a salutary tendency, and though from hence it might be inferred that the cure of fevers should be left to the operations of nature, or that our art should be directed only to support and regulate them, it yet requires but a moderate share of observation to understand that these are very precarious, and often wholly insufficient to overcome the disease. Permanent derangement of the function or structure of an organ is sometimes occasioned before such operations are set up, and a reliance upon them therefore often leads to negligent and inert practice. The necessity of treatment in fever is now indeed generally acknowledged. Occasionally, the natural tendency of fever to terminate favourably may be kept in view with great advantage; as, for instance, in the latter stages of *simple fever*, where measures of depletion are unnecessary, and wine and cordials would be doubtful remedies. In a large proportion of cases, however, the operations of nature may be superseded by the well-directed exertions of art. To point out what these are, to what extent they may be carried, and how they must be varied to meet the varying forms in which fever presents itself, is my object in the present chapter. It is to be regretted, that the nature of the subject is such, as to render it impossible to lay down any specific directions for the guidance of the student, as we may hereafter be able to do, when explaining the treatment proper in pneumonia, colic, or jaundice. All that can now be done is to notice the principle means that are

resorted to in the cure of fever, and to add such observations as may throw light on the objects for which they are had recourse to, and point out the necessary cautions in their administration. In no disease is so much left to the discretion of the practitioner, as in continued fever.

INDICATIONS OF CURE.

The general objects to be kept in view in the treatment of any disease are called, in medical language, the *indications of cure.* In the case of fever, they have, for the most part, been drawn from the hypothetical views of authors regarding the nature and proximate cause of fever; but such indications of cure are little calculated to direct us in the choice and application of remedies. The view which has been here taken of the varieties of continued fever, and of the circumstances which modify its symptoms, suggest the following as the simplest indications of cure in fever.

1st. To moderate the violence of arterial excitement.
2d. To obviate local inflammations and congestions.
3d. To support the powers of the system.
4th. To relieve urgent symptoms.

THE ANTIPHLOGISTIC REGIMEN.

An important step towards the attainment of all these objects is a strict attention to the ANTIPHLOGISTIC REGIMEN, under which term physicians include a great variety of details proper to be observed, not only in continued fevers, but in all febrile affections whatever. This regimen is of itself sufficient to cure a number of the slighter kinds of febrile disease, such as catarrh and sore throat. It consists in avoiding or moderating those irritations, which in one degree or another are almost constantly applied to the body. Dr. Cullen has divided them into three classes:—impressions made upon our senses;—the exercise of the body and mind;—the taking in of aliments. In all fevers, therefore, care is to be taken to guard against external heat, and such impressions upon the eye and ear, as would prove painful to the patient, and aggravate the symptoms of his disease. The popular prejudice against the admission of fresh air, the use of cold washing, and the frequent changes of linen and bedclothes, in cases of fever, is now gradually giving way; but for a great length of time it exerted a most pernicious influence over the treatment of fever. All exertions of body and mind are to be forbidden. The horizontal or a gently raised posture, "on a moderately hard bed," is to be enforced. The presence of aliment proving always a stimulus to the system, abstinence is to be recommended, particularly from animal food in the shape of broths and jellies,

which are too often had recourse to in the early stages of fever They load the stomach, increase the disposition to nausea and vomiting, accelerate the pulse, augment the heat of the skin, and occasion head-ach, flatus, tormina, and many other unpleasant symptoms. The utmost cleanliness is to be observed in the patient's person, and in every thing around him. His thirst is to be allayed by light, subacid, and *cool* drink, "by acid fruits, or simple cold water; by a solution of tamarinds, of cream of tartar; by apples sliced into water; or lemonade. In highly inflammatory cases, exposure to a current of air gradually abates or gives relief to the fever. When the stomach rejects cold drinks, the comfort of the patient may be consulted by taking it by table spoonsful, by holding a piece of ice in the mouth, or by eating slices of oranges or lemons cooled by ice."

The use of cold drinks are most proper after the hot stage is completely formed, and are not to be used after the perspiration has broken out; the temperature must be steadily and clearly above what is natural; given in this manner, they promote perspiration and sleep, and diminish the heat and frequency of the pulse. If given during the perspiration, they sometimes produce a sudden chill on the skin and at the stomach, with debility and irregular breathing, reducing the heat of the system suddenly and considerably; a bladder filled with water to the pit of the stomach of the temperature of 110° to 115° of Fahrenheit, small and frequent doses of ether, with laudanum, then suddenly relieve.* At the very commencement of the sweat, cold drinks are sometimes beneficial. The bed clothes and linen when changed, when the patient is perspiring, should be warmed and dried near a fire; the visits of friends should be prevented, or the presence of many attendants, as they tend to render the air impure. With regard to the temperature of the room it should be cool, and of this, the patient's feelings, when he is sensible, should be the criterion; about 62° is considered as a temperature, which is not stimulating, if that of the patient is above 98°, nor depressing if it be below, and most likely to produce the sensation of comfort; but as every case varies, it is necessary to ascertain by the feelings of the patient exactly the temperature which is most agreeable to him; but it must be one which is agreeably cool, and if the fever be very inflammatory, so reduced as to make it cold:

This latter injunction is very important, particularly as it is observed in hot summers and tropical countries, that in proportion to the heat is the fatality of the fever, and that removal to a high and cold situation, in the West Indies, often cures it. It is, therefore, of the greatest consequence to have our houses so constructed as to secure a constant, steady and reduced temperature, by double windows, thick walls, and cold air from an icehouse properly situated, so that pipes could be supplied from 62°, and lower as the case required. This is particularly necessary in the case of the aged and of children, who are so easily debilitated by excessive heat.

In Philadelphia after a month of excessive heat, medicine in the cases of children becomes entirely useless; the regulation of the temperature is, therefore, of the greatest importance, and will be considered hereafter. Fanning and exposure of the naked body to a current of air, will reduce the temperature very much. The practice of Sydenham of administering mild liquids; as milk and water, given with the view of lowering the excitement, has of late been entirely neglected; I have no experience on the subject. So powerful is it in abating excitement, that Sydenham gave a caution against its frequent use, as it had a tendency to bring it too low. C.

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* Currie.

POSSIBILITY OF CUTTING SHORT A FEVER.

Before proceeding to a detail of the other means which are resorted to in the treatment of continued fever, it is necessary to inquire how far it is possible, by a vigorous employment of measures in the early stages of a fever, to cut it short. The question has been much agitated, and there are many authors who contend that it can frequently be effected. It may fairly be admitted, that there are mild attacks of fever, particularly such as occur in young persons, where a prompt evacuation appears to have the effect of interrupting that chain of morbid actions, which ends in the full developement of fever; but it may reasonably be doubted, whether any of the severer cases of continued fever (those, for instance, either arising from contagion or from common causes, which extend to fourteen or twenty-one days,) could have been *cut short* by any exertion of art. Were it possible to do so in a few cases, it should yet be borne in mind, that active treatment in the majority of cases of continued fever, even though early resorted to, is chiefly serviceable, not in shortening the course, but in moderating the *violence* of the disease.

The cases, however, on record are so numerous, in which the use of certain remedies have succeeded in cutting short the fever, that it is always adviseable to try them; thus, in inflammatory fever, a full bleeding, the cold effusion promptly and vigorously administered, have had the effect of completely checking the disease; and in typhus, when the patient is going about in a listless state, with creeping chills, lassitude, &c. an emetic is given with the same good result, and as soon as it has operated, ten grains of carbonate of ammonia, with draughts of vinegar whey, as advised by Pringle, to excite a perspiration, or the emetic may be omitted, and the sudorific given alone, always observing the precaution of giving clean linen, free ablution, with warm vinegar and water, to purify the skin, and assist in the perspiration; and the removal of all sources of filth, which might perpetuate the disease; Dr. Rush mentions that Dr. Beardsly, of Connecticut, saved during a dysentery, many soldiers from infection, by having their beds removed from the wall of the room, and when convenient, placed in the middle of it,* a fact which in treating this disease should be remembered. C.

OF BLOOD LETTING.

Of the different means of fulfilling the indications of cure formerly laid down, the most powerful is the *abstraction of blood.* Every part of the treatment of fever has been the subject of controversy, but the employment of blood-letting is that, which of all others has been the most keenly disputed. As it is however of the greatest importance to have clear ideas regarding it, I shall make an attempt to estimate the utility of blood-letting in fever, and to point out the circumstances under which it may be proper to employ it.†

There cannot exist a doubt as to the necessity of blood-letting in the genuine inflammatory fever, the *endemic* of hot climates. The

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* Rush's Pringle, p. 269—70.

† No where have I seen this subject more clearly stated than in the writings of Baglivi, chap. vi. section 3.

violence of that disease, the rapidity of its progress, and the high degree of arterial excitement which characterize it, call for the adoption of a system of measures, at once powerful and immediate in their effects. On the first attack, therefore, blood is to be taken from the arm to the extent of twenty or thirty ounces, and in a full stream. This it is frequently necessary to repeat in the course of a few hours; the extent of the evacuation being always regulated by the violence of the symptoms, particularly by the degree of head-ache, "tensity," and the fulness of the pulse. These must be diminished without delay; and though other means are not to be neglected, it is upon venesection that our chief reliance is to be placed. Some have urged opening the temporal artery in preference to bleeding at the arm, but without sufficient reason; and here it may once for all be said, that opening the temporal artery is not an operation to be recommended, except under particular circumstances. It often fails, even when practised by skilful hands. The requisite quantity of blood cannot always be obtained speedily, or estimated accurately. There is, lastly, often considerable difficulty in securing the artery, nor does it appear that there is any peculiar benefit resulting from the operation to counterbalance those obvious disadvantages.

With regard to the employment of blood-letting in fever, its use is indicated by so many urgent and strong reasons, as the principal, most easy, and certain mode of cure, that a slight review of them here will be advisable, more particularly as it bears in its curative effects upon so many of the phenomena of the human system. The reader will recognise in the following remarks, an abstract of the results of the labours and enquiries of the late Dr. Rush, (detailed in his admirable essay upon this subject,) to whom the public are too much indebted, to require any eulogy in this place.

ADVANTAGES OF BLOOD-LETTING.

Blood-letting has many advantages in the cure of fever; it arrests it suddenly; it lessens pain; renders the pulse more natural, when too slow, too full, or too frequent. It checks nausea and vomiting, as in the malignant bilious fever, also diarrhœa in the measles; and tenesmus after dysentery, when all its other symptoms have ceased; it opens more easily the bowels when costive after taking physic during fever; it promotes salivation by mercury, and sweat, when the ordinary diaphoretics are given; it removes and lessens pain in every part of the body, also the burning heat of the skin; it checks and moderates profuse sweats; cures intolerance of light, coma; it induces sleep, and prevents effusions of serum and blood, cough, consumption, jaundice, abscess in the liver and dropsy; the results of autumnal fever; also the termination in gangrene of the malignant fever.

It prepares the way for the action of tonics; as, the bark, and by rendering fevers, which were remittent, of an intermittent type, it, readily, with the aid of these medicines cures them. It prevents relapses, for by being practised in time, in inflammatory diseases, it cuts them short, before a sufficient degree of debility is produced to produce a return on the application of slight exciting causes.

OBJECTIONS TO BLOOD-LETTING ANSWERED.

The prevalence of hot weather has been given as an objection to the use of the lancet. The natives of hot climates do not require it to the same extent, but without it, in proper quantities, they cannot be so speedily cured. Great apparent

weakness also so far from being an objection to its use in highly inflammatory cases and robust habits, is the strongest proof of its necessity. Neither is it improper in infancy and childhood; in those stages of life, the blood-vessels are more active. In old age, from free living and indolence inducing a fuller state of the blood-vessels, it also becomes necessary. Dr. Rush's opinion in this respect is supported by that of Botallus, who considers that blood-letting is more necessary in aged, than in youthful subjects. Hoffman also supports the same idea; it is also more required during menstruation and pregnancy, as the blood-vessels are peculiarly excitable and feverish in these states of the system. Fainting and coldness of the extremities do not always contra-indicate it. Petechiæ and sweats did not prevent Sydenham from using it with success. The long duration of a fever often shows a chronic inflammatory state of disease, which, therefore, becomes an additional reason for bleeding. The same is true of inflammations, as pleurisy; bleeding should be practised, where there is pain, or a tense and oppressed pulse.

The circumstance, that patients are worse after the second bleeding, should not prevent us from using the lancet again; thus Dr. Rush mentions, increase of heat, chills, delirium, hemorrhages, convulsions, nausea, vomiting, faintness, coma, great weakness, pain, a tense after a soft pulse, and its reduction in force and frequency, as proofs of the system rising to a state of vigour from one of depression, by the action of this remedy, and therefore as demanding its repetition. Chills following bleeding, occur in those fevers, in which, from the high excitement of the system, no chill appeared; bleeding reduces it, and a less malignant state is the consequence. Dr. Rush even states some cases to show that in malignant fever cold hands and feet and a ghastly countenance, the result of the fourth bleeding, in one case, were removed by a fifth; during the flowing of the blood the pulse rose; the patient was bled three times afterwards, at the end of three, ten, and seventeen hours; it fell and rose again by these successive bleedings, in all of which were lost thirty ounces of sizy blood, and so great was the vigour acquired by the pulse, that it required seven more bleedings to subdue it.*

Cordial medicines given in the depressed pulse often take away life. They are given under the absurd idea of raising the system, which is impossible by that means; for when given during inflammatory fever, as has been proved in all the varieties of inflammations, dysentery, &c. they induce apoplexy, epilepsy, coma, &c. and convert what was before a mild, into a malignant and deadly disease.

Dr. Rush obviates the objections to its inducing the nervous fever by stating, that when employed to a degree sufficient to prevent the gangrenous state of fever, a lower grade than the nervous, it may induce the nervous fever, but if employed in a degree proportioned to the disease, the fever instead of being rendered chronic or nervous, would be eradicated entirely by it.

As a general remedy, the circumstance that it induces debility is rather in its favour, for it is by that quality alone that it operates; without it it would not be a remedy at all. With regard to its inducing a habit requiring its frequent repetition, this is an objection which applies to the healthy state of the blood-vessels; then by abstracting blood frequently it may induce plethora; but in disease it cannot; for properly employed it may reduce the blood-vessels to their healthy standard, but can do no harm. Sometimes it is used to prevent a greater evil, as in case of strangulated hernia.

If it produces excessive debility, effusions of serum, in the chest, bowels, limbs and brain, it is because it is not drawn in sufficient quantity, or at the proper time. In general, its tendency to produce dropsy is feared only in malignant fever; in pleurisy, it is not dreaded, though malignant fever is a disease in which the action of the blood-vessels has been subjected to a cause far more prostrating than in pleurisy, and of course this state of fever requires a more powerful degree of a debilitating remedy to counteract the operation of this more powerful cause.

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* In this case it must be recollected that the symptoms occurred early in the disease. Dr. Rush mentions that in fevers which terminate in five days, it will be imprudent, even with a tense pulse to bleed after the third day.

CASES IN WHICH BLEEDING SHOULD NOT BE USED.

Here, before going any farther, we must recall the reader to those cases, in which blood-letting is thought to be pernicious, and to other cautions, which direct its proper administration.

1. It should not be used in those states of fever, in which there are great congestions of blood in the viscera owing to the weakened state of the arteries, as it may debilitate their action and increase the congestions; they must be relieved by frictions and stimulating applications to the extremities, gentle stimuli taken by the mouth, and cordial injections into the bowels; as soon as the system is a little excited by these remedies, blood may be drawn in small quantities, by cups or leeches, applied to the seats of congestion, and when the blood-vessels are sufficiently excited, it may be taken in proper quantities from the arm, in order to lessen the action.

It is seldom proper beyond the third day of a malignant fever, if it has not been used on the days previous to it; even the tension of the pulse is not always a sufficient warrant to take blood, in a fever which runs its course in five days; the lancet is useless in such cases. Purges, blisters, and a salivation are the remedies here.

It should be used with great caution in the close of the paroxysms of intermittents; it then weakens too much.

It should not be used in the weak and frequent pulse resembling that of typhus; cordials, gentle vomits and purges are then the remedies; also in the diseases of habitual drunkards; also after the suppurative process has begun in local inflammation; also after copious expectoration has taken place; this discharge serves the purpose of local depletion; if, however, there is great pain in coughing and a tense pulse, bleeding may be used. It may be omitted where there is time to wait with safety for the slower operation of purging and abstinence. The use of this remedy is not always followed with benefit, even when the pulse is tense; Pringle and others record instances of it; and sometimes when the pulse is tense, bleeding will not subdue it, as in hemorrhages: extreme pain is the only circumstance which can justify bleeding in these cases: however, these are irregularities which occur but seldom.

BLOOD-LETTING COMPARED WITH OTHER REMEDIES.

It is said that vomits, purges, sweats, salivation and blisters are a more safe mode of depletion; to this it may be replied: 1. that vomits are more uncertain in their operation; 2. they are unsafe, as in pregnancy; in apoplectic constitutions; in ruptures; and in cases where spitting of blood is threatened; they also induce cramp, bleeding, and inflammation in the stomach; 3. they are also incontrollable, operating less or more than was intended; 4. they are also often ineffectual in mild, and always so in fevers of great morbid action.

Purgatives, besides being uncertain and uncontrollable, often kill from the dangerous debility they produce. Sweating, besides being liable to these objections, is often by no means safe, as, when produced by antimonial medicines of that class. Howard and Goldsmith, it is said, were killed by James's powder: even mercury, which has subdued the malignant fever, lockjaw, and some other violent diseases, by abstracting two or three pounds of fluid from the system daily, compared with bleeding, is less manageable, because it cannot sometimes be brought to operate, though pounds of it are taken; it is not so quick in its operation as to be valuable in dangerous cases; it is a disagreeable and painful remedy, and cannot when the discharge is excited, be regulated, as blood-letting can.

Blisters are too feeble a remedy; the quantity of evacuation they produce, is too small to produce any great effect upon a fever, and in general they are inapplicable, from the irritation they produce to high grades of inflammatory action. Low diet is too slow and weak in its operation to subdue an inflammatory fever:

Blood-letting has many advantages over other modes of depletion; it abstracts the principal stimulus from the direct seat of mischief in a fever; viz. the blood-vessels: and thus relieves, like a grain of sand taken from the eye, in inflammation

of that organ. It is quick, manageable, is not troublesome, gives little disturbance to the system, and is less offensive than some other modes of depletion; it is attended with no immediate danger to life, is less debilitating when used in its proper degree, is followed by a more rapid convalescence than when vomits or purges are used; besides, it does not preclude the use of other remedies.

THE STATES OF THE PULSE WHICH INDICATE BLEEDING.

The following states of the pulse Dr. Rush states to indicate bleeding; 1. a full, frequent, and vigorous pulse, without tension, as it occurs in gout and apoplexy; 2. a tense; 3. a jerking; 4. a quick and tense; 5. a slow and tense pulse; 6. an uncommonly frequent pulse, without much tension, beating from 120 to 170 beats in a minute, occurring in the malignant states of fever; 7. a soft pulse, without much frequency and fulness; 8. an intermitting pulse; 9. a depressed pulse; 10. an imperceptible pulse, indicating increased action in the brain.*

THE STATES OF THE PULSE WHICH FORBID BLEEDING.

The slow, uncommonly frequent, intermitting and imperceptible states of the pulse, which require bleeding may be distinguished, says Dr. Rush, from an exhausted or debilitated state of the system, and that forbid bleeding, by the following marks:

1. They occur in the beginning of a fever; 2. they occur in the paroxysms of a fever, which have remissions and exacerbations; 3. they sometimes occur after blood-letting, from causes mentioned before; 4. they sometimes occur and continue during inflammations of the stomach and bowels; 5. they occur in relapses after the crisis of a fever. Dr. Rush considers that force and irregularity are the qualities of the pulse which principally demand our attention, and that frequency should not be much considered, since this quality is much under the influence of the passions, motion, and diet, and of course our judgment upon it liable to be disturbed by frequent and accidental causes.

Sometimes the pulse gives no indication of the force of disease; a red colour of the cheeks, drops of blood coming from the nose; no diminution of the heat of the body after bleeding, and the existence of an inflammatory constitution of the atmosphere; a recent attack; the part attacked vital; great pain; difficult respiration; a watery, lively, or suffused eye, are signs that the pulse may be disregarded, in the opinion of Dr. Rush.†

OTHER CIRCUMSTANCES WHICH REGULATE THE USE OF THE LANCET.

The prevailing epidemic, if inflammatory or otherwise, must assist us in determining the necessity of bleeding; an hereditary disposition to inflammation demands bleeding; the season of the year and the state of the weather influences its necessity; thus, in dry or in cold weather, bleeding is more necessary than in moist or in

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* Hunter states that in inflammation of the brain the pulse varies more than in inflammations of any other part, and perhaps we are led to judge of inflammations there, more from other symptoms than the pulse.—Rush's Works, vol. iv. p. 331.

† It may, however, here be observed, with the greatest deference to the memory of Dr. Rush, and it is a fact well worthy of note, that the redness of the face as if it were painted with red lead, and the watery eye, resembling its appearance after crying, when the tears are beginning to disappear, are almost certain signs of bile in the stomach, and require emetics repeated frequently, or purges to relieve it; the anomalous symptoms, produced by the presence of this fluid, are so numerous and various, that they personate almost all diseases, and every variety of pain and convulsion. When the red lead-coloured face, and the lacrymose eye are present, emetics and purgatives have a most beneficial effect. C.

long continued hot weather: corpulent people do not bear bleeding so well as those who are lean and spare; nor citizens so well as country people. If the patient be accustomed to be bled, more should be taken; if large in person, also the quantity should be larger.

Dissolved blood, blood of a scarlet colour, without separation of its parts, denote the use of the lancet; the former, however, only in the first stage of fever, as afterwards the loss of blood is perfectly useless. Blood with serum resembling the washings of flesh, serum of a red or green colour, the buffy blood, all likewise indicate it. These signs (from circumstances mentioned by our learned author immediately afterwards) of diseased blood, are not to be taken as unequivocal evidences of its necessity, since it is altered very much by the size of the orifice, by the manner in which it flows into it, slow or fast; the dissolved blood with an oppressed pulse, and the buffy blood, are the best signs; the former, only, as was before observed, is proper in the first stages, or in robust habits. It should be copiously and rapidly drawn, when taken in inflammatory diseases, particularly where the organs in a state of inflammation are important to life. Much less may be taken, if two blood-vessels are opened than one; if the blood be taken in a standing posture than if lying down. Sydenham relates the history of a number of cases of the plague successfully treated by bleeding in a standing posture nearly to fainting, and before any eruptions appeared: The yellow fever has been cured by the same means; also accidental, sudden, and copious hemorrhages often cure common inflammatory fever. Sometimes it is necessary to bleed a robust person in a supine posture, in order to take away as much blood as will overcome the disease; otherwise, it will be necessary to repeat the operation; if, on the contrary, the person should be debilitated, a sitting posture will be more advisable, to produce the requisite debility the sooner, or they may be bled to a few ounces in a lying posture and suddenly raised to a sitting one, and thus the requisite debility will be induced.

The removal of pain, faintness, the pulse becoming steady and feeble, and the blood of a thin consistence or not coagulating, are signs of a sufficient bleeding.

The signs of the inflammatory diathesis may here be presented to the reader, as occurring in the highest grade of that type of fever, and indicating this evacuation; the full, tense, hard and bounding pulse, the face and eyes red, with a violent head-ach, high delirium, hurried breathing, swelled epigastrium, tongue white and dry, skin hot, with costiveness, and great uneasiness: bleeding then continued, as before observed, till fainting, in the highest cases will be proper. In malignant fevers, Dr. Rush says, that he has always observed the cure to be most complete, when the patient is pale in the face, and feels faint after bleeding; the remaining diseased action of the system time will wear away; in bleeding, however, in malignant cases, and where the pulse is depressed, Dr. Rush takes but three or four ounces at a time; and when the pulse rises he draws more, repeating it three or four times a day; the blood-vessels thus recover their tone; in all inflammatory cases, the nature of which is not exactly known, it is best to begin with moderate bleedings, increasing it with the violence of the symptoms; fixing no limit but the urgency of the case to the quantity of blood taken away: 56 and even 90 ounces have been drawn with the happiest effects; it is, however, only in the first stages of disease, that it is at all proper in such large quantities; as syncope, when induced in the last days of a disease, often produces death.

Blood-letting, like all the other remedial measures of our art, has its dose, and it must be prescribed according to the case: three or four ounces lost often divert the action from the organs more important to life; and though the case is incurable, bleeding often eases pain, prevents convulsions, composes the mind, protracts the use of reason, induces sleep, and thus smooths the passage out of life.

Blood should be taken from an artery, because, according to Dr. Butler, it is less likely to produce fainting, which in pregnancy almost always produces abortion; and more relief is obtained from a small quantity of blood taken from an artery than from a vein. Bleeding from the arm is more convenient, attended with less danger of wounding a tendon, than in the foot, and as in the latter case the foot is put into warm water, it is easier to ascertain the quantity which is taken from the arm.

Local bleeding is proper where there is local inflammation, as from a contusion,

or other injury, when the general fever has arisen from the affection of a part; when the local affection is evidently the result of the general fever, then general bleeding Dr. Rush thinks is preferable.

Bleeding may be used at all times, the above signs and cases excepted, when indicated by the pulse and other circumstances, in continual fevers; and also in the paroxysms of such fevers as intermit. So necessary did Dr. Rush consider bleeding in the latter, that a student used to sit up with his patients, and whenever the fever came on, he abstracted a few ounces of blood; when the fit went off, to avoid debility he gave the patient four or five drops of laudanum, which was followed by refreshing sleep.

Common continued and typhus fever do not necessarily require the adoption of blood-letting. A large proportion of cases, especially of the latter, would be hurt by it; and in many, to say the least, it is uncalled for. But, on the other hand, there are some, and those among the most formidable which fall under our observation, which as imperiously require it.

The object for which blood-letting is instituted in the common continued fevers of this country, and in genuine typhus, are various. Some recommend it very early in the disease, in the hope of cutting it short at once. This is a fortunate result of the practice occasionally witnessed; but it is one which can seldom be anticipated. The legitimate object of blood-letting in these diseases, is the checking those dispositions to inflammatory action which are so often met with in severe cases, which sometimes come on insidiously, and at other times suddenly, and are productive in either way of serious mischief to the affected organ. This applies with peculiar force to those conditions of the brain which are supposed to depend on congestion or *sub-acute* inflammation; for the delicacy of its structure exposes it readily to injury; and injury of the brain, even of the slightest kind, is always to be dreaded. It is frequently observed, that a judicious abstraction of blood in the early stages of fever not only diminishes the head-ache, the great sensibility to light and sound, the delirium, the cough, the pain and fulness of the abdomen, but it apparently shortens the course of the disease, and more obviously still, the period of convalescence.*

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* The evidences of the acute state of inflammation are general arterial turgescence, sharp and fixed pains in the head, chest, or abdomen, anxious and oppressed breathing; a jerky, rapid pulse, with some hardness, and tensity, dryness of the tongue, blood-shot eye, hot and dry skin, cupped and buffy blood:

The sub-acute is evidenced by little or no pain, a frequent and less resisting pulse, at the same time some evidence of weakness, the tongue inclining to brown, with a greater degree of general anxiety and oppression.† These states of acute and sub-acute inflammation occur more frequently in the towns and cities of Britain, where a large mass of the poor live principally on porter, and take less solid food than they do in the United States; their systems are there more inflammatory, and sooner sink into the low typhous state; the use of venesection, therefore, both in these forms, and in the congestive state, in which the veins are in a state of plethoric turgescence, recommended so strongly by Armstrong, does not apply with the same force in this country, where our diet is more solid and nourishing. The re-action is here not so violent, and when it becomes typhous it is

† Armstrong on Typhus, p. 35.

It is at the onset of the fever, that is to say, between the first and fourth day, when the good effects of blood-letting are more

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best treated in the manner laid down by the old writers: that is, by more sparing venesection, taken early and only on the first or second day of the febrile state:

The symptoms above described as acute and sub-acute, indicate a state properly typhoid; the use of depletion by moderate venesection, once or twice to 8 or 10 ounces, or to 3 or 4 often repeated, are in the first days of acute symptoms proper, at the same time bleeding locally from the seat of inflammation; the action, however, soon subsides; general venesection will then be dangerous; local bleeding from the seat of the pain, with blisters and purges, will be sufficient. Where there is great general debility with local fulness in parts, towards the end of the inflammatory stage, local bleeding, giving wine at the same time, to support the strength, is sometimes necessary; the local and general indications are thus completely fulfilled: A blister to the part will confirm the effect:

Occasional emetics; bleeding and sudorifics, suit pectoral determinations best; but when acute inflammation attacks the bronchia, bleeding should not be used so freely as when it fixes on the pleura. In the weak, the delicate, and the aged, bleeding should give way to purgatives and blisters over the inflamed parts, with the warm bath; decoctions of senega and other sudorifics; as vinegar whey; hot lemonade; and warm tea:

Balsam copaiba, given in small doses, promotes expectoration; linseed tea with 8 or 10 drops of antimonial wine may also be used for the same purpose: Calomel given as an alterative will then complete the cure:

In the sub-acute form, local bleeding; cool air; silence; rest; saline purgatives and sudorifics, will be sufficient:

If the head be affected, raising the bed or making the patient sit up, will be useful:

Free purging and copious glysters, suit the hepatic, gastric, and abdominal determinations: The diet should be cooling and digestible, as arrow-root with lemonade, tapioca, sago; and this should be continued during the recovery from these forms, as relapses, chronic inflammations, and dropsies of the chest often follow under a more stimulating regimen:

Relapses are best prevented by keeping the bowels open; sustaining a slight affection of the mouth by calomel, and continuing the mild diet:

Local bleeding over the seats of inflammation, when it does take place, will generally relieve it:

The congestive form of typhus is known by the absence of the hot and dry skin; by the oppression, congestion, and turgescence of the venous system in particular parts, and by the fluidity and dissolved state of the blood, or at least by the absence of the inflammatory buff, which occurs generally in the acute and sub-acute forms:

It is also known by paleness, the bloated lividness of the face; by the anxious breathing; by the low struggling and variable pulse; when from the first it is impossible to hold up the head: the mind is dull, affected with stupor; the patient has a bewildered look; the eyes glaring without redness, in fact all the symptoms indicating a loss of arterial action and general weakness.*

Bleeding moderately and very early employed; the tepid bath; frictions of the skin; calomel; purgatives; emetics and blisters, are the proper remedies for this form.

In the aged and the delicate, venesection is improper; and in the robust, when by its proper use the arteries have been liberated, and the distension of the veins has been lessened, diffusible stimulants should be given in such doses as to excite the arteries moderately, and not induce inflammation; a slight ptyalism will, after bleeding, establish a well balanced action of the blood-vessels, and prevent local inflammations.

The poor, whose anxious minds, precarious, scanty and bad food, miserable filthy dwellings, debilitate the system, require always a more tonic treatment than those who live in comfort: The inhabitants of cities also do not bear depletion so

* Armstrong, p. 68—174.

unequivocally exhibited. At this period of the disease, the powers of life may be *oppressed*, but it is not probable that they are yet much *exhausted*. From this they will recoil, if the oppressive load of the disease be quickly removed.* But blood-letting may sometimes be resorted to with the best effects at more advanced periods of the disease. Great nicety indeed is required in distinguishing the symptoms that demand it, and in apportioning the evacuation to the extent of local disease, and the general powers of the constitution. Delirium, in particular, is a symptom which may sometimes be alleviated by a small bleeding (as, for instance, to six ounces,) even at an advanced period of the disease; but, for the most part, it will be found preferable to employ *local blood-letting*, when the object in view is the relief of an urgent symptom. Of the comparative advantages resulting from general and local bleeding, in the continued fevers of this country, it is difficult to speak with precision. I have frequently had occasion to see affections of the head, in fever, yield speedily to the application of leeches, where general bleeding appeared only to weaken the body, without influencing the local affection. Leeches I believe to be, upon the whole, preferable to the application of cupping-glasses, as occasioning less irritation.

The appearance of the blood drawn in cases of continued fever varies considerably. To a certain extent, it may serve as a guide to us, in indicating the propriety of further depletion. It is sometimes buffy, and the coagulum firm; but in genuine typhus the coagulum is commonly loose, 'the blood thin, livid, dissolved, or sanious;' appearances which contraindicate the employment of bleeding. In a case of great oppression of the brain, however, amounting almost to apoplexy, but connected with the *invasion* of fever, I once saw the most marked good effect from general blood-letting, and yet the blood drawn scarcely coagulated at all.

OF THE COLD AFFUSION.

Cold affusion, upon which great reliance was at one time placed in the treatment of fever, is attended with so much inconvenience and fatigue to the patient, that in this climate it is now very generally superceded by the employment of cold or tepid sponging. From this, in most cases, much benefit is derived. It is grateful to the patient; it diminishes the heat of the body, takes off that dryness of the skin which occasions so much irritation, and is

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well as those of the country. This applies, however, only to the poor, who live in filthy and close dwellings and want wholesome food. The active, industrious, middle classes in cities, who are temperate, are equally robust with the same people in the country. C.

* See Bateman on "the Contagious Fever of this Country," page 102; a work containing a most judicious exposition of the principles and details of the treatment of continued fever, upon which it would be difficult to improve.

sometimes succeeded by a quiet slumber, and a gentle perspiration. It may be repeated whenever the skin is *hot and dry*, and it is often useful even at very advanced periods of the disease. In those exquisite forms of inflammatory fever which are met with in hot climates, the cold affusion, in the manner recommended by the late Dr. Currie, is a powerful means of diminishing the high excitement that prevails. We may form some idea of this, from the well marked good effects of the application of cold to the head, in diminishing head-ach, delirium, and restlessness, in the common continued fevers of this country.

In America the same practice is applicable. With regard to the application of cold water, the rule of Dr. Currie is as follows:

In the evening, when the exacerbation is at its height; when flushing, thirst and restlessness are present with a temperature above what is natural, it may be resorted to. It must not be used during the cold stage, or when there is a considerable perspiration. If great weakness also be present from exhaustion by diarrhœa, it is also improper.

Dr. Jackson of the West Indies decides the propriety of this remedy, by the state of the sensibility of the surface. When by applying the hand to the skin, he finds the susceptibility to impression deficient, and there is no internal local inflammation or congestion, he attempts by affusions of warm water over the surface, by washing the skin with warm soap and water and rubbing it with brushes, and putting the patient into a warm bath to restore to the surface the broken balance of the excitability, thus to excite the skin. If the action of the blood-vessels be either below or above par, violent or prostrated, he considers the use of cold affusion improper, till bleeding, purgatives, and other evacuations in the former case, and the warm bath, &c. in the latter, have rendered it proper. Dr. Currie, on the contrary, uses it in the first stage of fever, when the temperature is above 98° without evacuations.

In the application of the remedy, though its virtues from the prejudices of the people have not been fully made known, it is certain that in the regular continued fevers of northern and temperate latitudes, both typhoid and inflammatory, with a hot skin, where there are no local determinations, it is valuable, and often cuts short the fever. In hot climates the most ardent form of bilious fever is often mitigated by this plan. Sailors raging with delirium have been instantaneously restored to reason by jumping into the sea. In warm climates, where fevers are attended with violent sudden blazes of re-action, or equally marked and sudden evidences of prostration, it is often necessary to temper its use with more discretion, viz. by venesection, &c. when the fever runs high, and the use of the warm bath, frictions to the skin, &c. as above stated, when the blood recedes from the surface, and appears in inflammations or congestions of the internal organs in a prostrated state. So variable indeed is the system, in warm climates and also sometimes in hot seasons of our own latitude, that bleeding will often be found necessary at one time, when shortly after, stimulants will be proper.

In applying cold to the surface, therefore, it is necessary to recollect, that it admits of various degrees. It may be used by cold affusions of two of three gallons, between 40° and 60° of Fahr. at a time, dashed over the body and frequently repeated, and then removing the patient to bed; or more gradually from a watering pot, or by sponging the body with cold water, or, to allay the prejudices of friends, with vinegar and water, or brandy and water, which cools more by evaporating more rapidly, or salt and water, or by exposing the patient to a current of cold air.

Salt water was preferred by Dr. Currie, from its stimulating effects upon the skin, by which he thought the debilitating effect of the cold was prevented: it is also more grateful to the patient, and it may be applied to the surface for a greater length of time with less hazard; a person preserves his colour and the brightness of his eye longer in salt than in fresh water: vinegar and water is more expensive than salt and water: simple cold water, will, however, answer every purpose; though if the case is doubtful, the salt water should be used.

The effects of this plan, if used on the first or second days of the disease, is to cut short the fever; and if it is used after the third or fourth, it mitigates its violence and shortens it. It has been of use even on the eleventh, twelfth, or thirteenth day; if the debility be too great, sponging the surface may be used in its stead.

In the irregular, chilly, feverish and forming stage of typhus, where nausea, debility, weariness, paleness are present, the warm bath is preferable. It then stimulates and equalizes the circulation, when the cold would endanger life. United with tepid drinks, as, barley water or gruel, a gentle sweat is produced; the tone of the stomach is restored, and the patient feels invigorated. In this stage, emetics, purgatives, and the warm bath do all that can be expected, and often cut short the fever. It must here be recollected that we are speaking of the warm bath, which, as above stated, is applicable to states of the system in which the temperature is below natural. The tepid affusion, however, Dr. Currie found to be applicable only to those cases, in which the cold bath was, as it reduced the temperature in the same manner, and in the same degree. The heat to use it, must be regularly above natural, and even in cases where it did not exceed 98° it reduced the temperature to such a degree, as to endanger the safety of the patient. Indeed Dr. Currie thought that the tepid water lowered the temperature of the body more rapidly than the cold water. The tepid differs, however, from the cold affusion, in being less permanent in its effects, as he never saw the tepid affusion stop the progress of fever. The tepid or warm bath, it must then be recollected, are proper when the temperature is below natural; the tepid affusion only when it is regularly and steadily above natural. The reason, why the tepid affusion is more debilitating than the warm bath, is the evaporation attending the former, which abstracts the heat more rapidly than even the cold affusion. Rubbing with brandy or any spirit, as being more volatile than water, is liable to the same objections.

Exposure to cold in the chilly stage of typhus, is always improper, as it may induce internal inflammation of the head, lungs or kidneys. The room, for this reason, should be about 60°. The cold affusion is not always admissible in the inflammatory typhus; thus, when, though the heat is above natural, the skin, particularly where the abdominal viscera are inflamed, is found to be moist, and the patient is chilly; the warm bath is then preferable to the cold. Dr. Currie advises ablution with water, from the temperature of 75° to 87°; when from the lowness of the action, or the continuance of the disease, there is danger of injury. However, it is by its effects upon the blood-vessels that its value is estimated; and as the author remarks, it is certainly in some cases not only applicable to the early stages of continued fever, whether of a high or a low grade; but it has succeeded in America, even in the advanced stages, when the heat in the after part of the day is considerable, when delirium is present, with coma and subsultus tendinum, if the pulse still possess some strength; and even though it should intermit.* It should be repeated as often as the surface becomes hot and dry, and the thirst becomes considerable; observing always, if the feet or other parts of the body be cold, to restore the equilibrium, first by immersing them in warm water, by frictions, &c. and then seating the patient in a tub, to use the cold affusion, which may be graduated from simple sprinkling, to pouring a few quarts or gallons over the parts which are preternaturally warm. The thirst is at once removed, free perspiration, comfortable feelings, and recovery from stupor, are the results. It may occasionally from debility, be necessary to administer stimulants; as wine, brandy, to give tone to the circulation; the cold affusions have then been followed by the best effects.

The heat of the skin sometimes proceeds from too much bed-clothes, from close confined rooms, hot drinks, excitement from worrying visits when the power of the system has flagged; it will therefore be requisite to ascertain exactly its true state by a deliberate examination before it be used. To sum up; it may be applied in all stages of typhus, when the heat is steadily and regularly above natural, and there are no local determinations.

Pain in the head, delirium, with languid circulation in the extremities, are often relieved by ice, and by cold water applied by cloths to the head, and warm water

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* See Medical Recorder, Vol. VII. p. 384, for Smith's observations on typhus.

to the feet. Blisters to the head or back of the neck can only be useful in relieving these symptoms, when the excited stage is nearly passed; they are then of benefit. They often procure sleep by translating the excitement to the surface. C.

EMETICS.

When the opportunity offers of administering remedies in the first days of the fever, an emetic should never be omitted; 'after, however, the free use of the lancet, if the symptoms show a determination of blood to the head, as apoplexy has sometimes been the result of its neglect.' The following draughts may be recommended for this purpose.

℞. Pulv. Ipecac. ℈i.
Aq. Menth. Sativ. ʒx.
M. f. haust.

℞. Pulv. Ipecac. gr. xvi.
Pulv. Antim. tartariz. gr. i.
Aq. puleg. ℥i.
M. f. haust.

Besides clearing the stomach, an emetic seems to possess some power of determining the blood to the surface, and in this way relieving the oppression of internal organs. "They are particularly useful on the onset of the disease, when there is paleness of the face, weariness, dejection, debility, coldness, succeeded by slight fevers, nausea, weight about the precordia, giddiness with a low pulse; followed immediately by a purgative of calomel and jalap in this stage, they sometimes cut short the disease at once.

In the inflammatory forms when the tongue is loaded with a whitish or yellowish fur, with uneasiness at the stomach, after a full bleeding, emetics are always useful."

They also, by discharging the contents of the stomach, prevent diarrhœa, in the latter stages, when the system is too much debilitated to bear active purging. Sydenham found that an active emetic, given in the continued fever of 1661, &c. prevented many serious symptoms in the course of the disease; the principal of which, was a weakening looseness in its latter stages. If an emetic was not given, he found that the patient suffered materially from this affection, which could not afterwards be controlled by astringents, or any other remedy: but immediately after its operation, when given early in the disease, he immediately recovered from the nausea; blackness of the tongue; anxiety and restlessness, with which he had before been affected; and as soon as the fever commenced, the first thing he did was to bleed and then give an emetic; he gave it, however, also, at a late period, provided the patient was able to bear it, even on the twelfth day of the disease. In general, the sick bear emetics better than purges, or any other depleting remedies, when the tongue is foul;* in the cases of children, ipecacuanha is to be preferred to any other emetic, from its mildness.

Sometimes they are given in small doses, so as to nauseate in the first periods, when they lessen the fever by purging or sweating: they may even be given in a more advanced stage of the disease, at the commencement of the exacerbations; as they weaken, if much good is not done early they should be omitted.† They may be combined with the saline medicines mentioned below, in any degree, to produce either the emetic, the sudorific, or the purgative effect, according to the case. C.

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* Rush's Sydenham, p. 17, note.

† Philip, p. 246—7.

SALINE AND ANTIMONIAL MEDICINES.

Saline medicines, such as the citrate of potash and acetate of ammonia, are very useful throughout the early and middle periods of the disease.

℞. Sub-carbon. potass. gr. xvjjj.
Succ. Limon. ℥ss.
Spirit. myristic, gtt. x.
Aq. distillat. ʒvi.
Sacchar. alb. ℈j.
M. effervescent. finit. fiat haust. tert. quaq. hor. repetend.

℞. Liq. Ammon. Acetat. ʒiii.
Aq. Menth. Sativ. ʒvi.
Syrup. aurant ʒi.
M. ft. haust. quart. hor. repet.

℞. Mist. camphor. ℥ivss.
Liq. Ammon. acetat. ℥iss.
Vin. Antim. tartar. ʒii.
Fiat. mist. cujus sumat ʒi. quart. quaq. hor.

Pringle thought highly of the spiritus mindereri, rendered slightly alkaline by the addition of a small quantity of the carbonate of ammonia, after the spirit was formed; and when there was local pain, he speaks of the addition of the syrup of squills, instead of the ammonia, as being valuable.

They allay thirst, and appear to exert some influence in controlling the action of the heart and arteries. They should constitute the basis of our treatment in most cases; and in the milder forms of *simple* fever, little else is required.

Antimony was long distinguished as a *febrifuge* of great virtue; but latterly an opinion has prevailed, that its efficacy in the treatment of fever is rather a matter of tradition than the dictate of experience. To this I cannot subscribe, having had frequent opportunities of satisfying myself of its claims upon our confidence. It occasionally acts upon the stomach and bowels; but independent of this, antimony proves useful in fever, apparently by some power of diffusing and equalizing the circulation. The oxyd, as we find it in the *pulvis antimonialis* of the London Pharmacopœia, is, I believe, the best form in which it can be administered. In combination with small doses of calomel, and given either at night, or every six hours, according to the urgency of the symptoms, its efficacy is often manifested by an improved appearance of the tongue and alvine evacuations.

'In the highly inflammatory form, after the hard, bounding, frequent, and tense pulse has been reduced, a solution of six grs. of tart. emetic to the quart of water, given in the dose of a wine glass full every four hours, will prove a valuable sudorific. Its advantages are, that it can be made to vomit by giving it in the same dose every ten or fifteen minutes, or act as a purgative by administering it every two hours; graduating it according to the case.'

OF PURGATIVES.

No doubt can be entertained respecting the propriety of exhibiting purgatives during the whole course of continued fever. For this purpose, the following draught may be recommended.

℞. Infus. Senn. Compos. ʒx.
Magnes. Sulphat. ʒii.
Tinct. Senn. ʒi.
Syrup. ʒi.
M. Fiat haust.

Combinations of jalap or rhubarb with calomel, as the following, are well adapted for the commencement of fevers.*

℞. Pulv. Jalap. ℈i.
Hydrargyr. submuriat. gr. iv.
M. ft. pulv.

℞. Hydrargyr. submuriat. gr. ii.
Sacchar. alb. gr. iv.
M. f. pulv.

'In typhus castor oil is useful; as it may be made to operate either as a laxative or a purgative, according to the case.'

Purgative medicines are serviceable in different ways. They diminish, in an early period of the disease, the mass of the circulating fluids; lower the *tone* of the whole system; and expel from the body aliment, the fermentation or putrefaction of which would necessarily aggravate the sufferings of the patient. At a later period, they evacuate those morbid secretions of the liver and bowels, which are continually taking place; and the lodgment of which would tend greatly to *oppress* the nervous system, and, therefore, increase the danger. It is not to be imagined, however, that the administration of purgatives in fever requires no particular caution. It is indispensably requisite to watch the degree to which the abdominal viscera are affected, and cautiously to refrain from them (or at all events from the most active of them, such as, jalap, colocynth, or calomel,) whenever inflammatory action is present, or any

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* See "Observations on the utility and administration of Purgative Medicines in several Diseases," by Dr. James Hamilton; a work of great merit.

'In synocha where the fever runs high with local pains, pulse tense, strong, and hard; skin hot, &c. the purging should be copious, and repeated every day, after full bleeding as before advised. The fever under this treatment will soon be suspended: a slight affection of the mouth with mercury, will render the cure more certain: It may be effected by giving a grain of calomel every night and morning, or four grains of the blue pill, and rubbing into the surface of the thighs, the size of a nutmeg of strong mercurial ointment twice a day, to produce as soon as possible the result; as soon as the mouth is affected, the mercury should be suspended, and the thighs washed: A gentle ptyalism is of the utmost consequence in typhus as well the remittent forms, particularly in the south: it relieves at once, and immediately on its taking place.' C.

disposition to it, as evinced by diarrhœa, or tenderness of the abdomen.*

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* The following mode of treatment of typhus, by Dr. Miner, abridged and extracted† upon his Essay on Fevers, will well deserve the attention of the profession.

"When called to a patient who has the precursory symptoms of fever, or even if he has advanced two or three days into the preparatory stage, after we have investigated the nature of the case, the first inquiry is, whether there be a rational prospect of *breaking up*, or procuring a *resolution* of the disease; if there is, to make the attempt is of immense importance. The means should be such as can be most conveniently employed, be liable to the fewest accidents in their execution, and though they might happen to fail of breaking it up, they should be such as will best moderate its violence, shorten its duration, and at the same time put the patient in the least danger of *sinking* at a critical period, and, also, best prepare him for the subsequent appropriate remedies. When the fever has a typhoid character, SLOW AND MODERATE PURGING WITH CALOMEL, answers the indications just mentioned, better than any other method. It is the only one, of all the common devices for breaking up fevers at their access, which in my practice, has been attended with any degree of certainty. The calomel, mixed with any mild syrup, but not in the form of pill, should be administered in small doses—from *two* to *five* grains, every *two* or *three* hours, according to the circumstances of the patient, till sufficient catharsis is produced. If possible, the calomel should be given in such doses, and at such intervals of time, *as to be retained in the stomach and bowels twelve hours*, before it produces its operative effect. But if catharsis does not take place in eighteen hours at farthest, it must be assisted by castor-oil, or some other *mild* vegetable purgative. At the same time, it is proper to pursue a *moderate diaphoretic regimen;* such as the pediluvium, tepid aromatic, and diaphoretic drinks, fomentations and sinapisms, or epispastics, as the local symptoms require. When the pain in the head is violent, *a blister to the forehead* will not only be of essential service in relieving this particular symptom, but will very much assist the effort at breaking up the disease, by superinducing an additional new action. Warm bathing is also an excellent adjuvant in the severer cases. In putrid fever, when the heat is above the natural standard, and the skin dry, we may also resort to cold affusions, with a cooler regimen, there being nothing in the calomel practice to interfere with its use, in truly hot cases. Cold affusion is, however, with us, rarely indicated; as in the majority of our fevers, which are decidedly of *the nervous type*, the heat scarcely exceeds the temperature of health, and is *often below it*, during their whole progress. If the catharsis incline to be excessive, it must be promptly checked by opium; if too sparing, the vegetable cathartic is to be repeated. When the patient has been previously purging himself, injudiciously, with an ill chosen article, or the case is attended with a diarrhœa, or there is reason to suppose that the calomel will pass rapidly through the bowels, or operate harshly, or even if there is much irritability of the system in general, it requires *a single medium cathartic dose*, with *a sufficient quantity of opium*, to stay it, at least, for twelve or fifteen hours. For a general rule, all the *anomalous cases* of simple fever, especially those of the low and simple kind, which there is reason to apprehend might terminate fatally in one week, unless prevented by art, require opium to be combined with the calomel from the very access, provided any evacuation is admissible; nor are they safely managed, unless the patient is kept uniformly and perseveringly under the influence of opium, to the termination of the disease.

"There is something peculiar and specific in the operation of calomel, differing from every other medicinal agent; and the more slow in its operation, to a given point, the more obvious is this difference. Its effects upon the stomach, small intestines, lungs, liver, spleen, pancreas, &c. have long been well known and acknowledged, and either from these causes, or something not yet ascertained, its counteracting effect at the access of febrile diseases, under suitable management, is preferable to every other known article. Its moderate use, in small doses, during the first stages of fevers, for the purpose of *changing* action and *preparing* for a

† By the venerable Thacher, see his Modern Practice, p. 245-52.

In typhus fever when the skin is hot and dry, the arteries turgid, the evacuations may be free and the use of active cathartics, will be advisable, particularly as the bowels are often torpid: A tenesmus, diarrhœa, or griping indicate their

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subsequent supporting and tonic course, has long been established, and rests on the highest testimony. No one article so certainly *counteracts* and lessens morbid action, equalizes the excitement, and *prepares* the patient for the use of tonics. Judiciously used, it overcomes the irritability of the stomach, on the one hand, or moderates the torpor, on the other, which would otherwise prevent their successful employment, and produces a favourable state of the skin, and other excretory organs. By this management, the patient is fitted for the bark and other tonics, better and earlier than in the usual way. Indeed, *whether the bark is advantageous at all, depends almost entirely on the first week's preparation.* To a neglect of this particular point, we chiefly owe the various and opposite testimony, with respect to the efficacy of this important article. I have never had a case of *regular* simple fever, the very mildest excepted, in which the bark and opium might not be used with obvious benefit, during the stage of exhaustion. By the judicious treatment of the disease, in its *first stages*, with calomel, all the desired preparatory effects are produced, without materially diminishing muscular or arterial strength, or wasting the vital powers. However, the object is not merely to prepare the system for the subsequent supporting treatment, in order to sustain the powers of life under a protracted disease. We usually obtain *a complete resolution*, and thus *break up* the disease itself immediately. It is confidently believed, however surprising it may appear to those who have not witnessed the fact, that this simple process of *slowly and moderately purging with calomel*, when employed *sufficiently early*, does not fail in more than one instance in ten, of *breaking up the disease at its very commencement.* In the whole course of my practice in [*regular*] typhus, of all who have applied within the first forty-eight hours after the obvious access of the disease, two cases only have proved fatal; and I am pretty confident, that not one has failed, in which the patient had not been tampering with emetics or cathartics, previous to my being called. When from these or other causes, we have failed of breaking up the disease, the remaining *preparatory treatment* for the first week, demands our attention.

"Whatever may be the opinion with respect to critical days, it is certain, that all our late typhoid fevers have very regularly observed *weekly, critical periods.* It is an old, and very just remark, that in all *regular* diseases of this description, they are generally but little benefited by the bark, and articles of a similar tendency, till after a prominent critical, or semi-critical change; that is, not until *morbid irritability of the stomach and bowels, on the one hand, or torpor on the other, is overcome, local pains, and other urgent symptoms, relieved, and sometimes in every twenty-four hours at least, the tongue is moist, and the skin and other excretories are free.* So imperative is this rule, that I never knew a physician, who [in a case of regular fever] was daring enough to violate it. There are various means which are adopted for the purpose of producing this particular state of the system. This kind of crisis, however, by the usual management, does not generally take place until *the end of the second week*, when the patient is too frequently so much exhausted, that tonics are apt to produce very little effect, or the system is still so irritable, that they cannot be borne at all. But it very certainly occurs, at *the end of the first week*, and occasionally some days earlier, especially in the more severe and rapid cases, when the following alterative course is properly executed. Calomel in small doses, united with opium sufficient to stay it upon the bowels, and also, sufficient to allay other irritation, and if *the skin incline to be dry*, and the heat be *much increased*, with ipecacuanha, should be administered, as *a preparatory course*, during the first week. But in most of the phlegmasiæ, and in many low and irregular cases, the partial crisis, or semi-critical change before mentioned, is produced, and the system is fitted for tonics, in a much shorter period. When this happens, we must enter *immediately on the supporting course*, and except in a few obstinate cases of local inflammation, *instantly suspend* the calomel. It requires as much judgment, to know *when to abstract* this article, as to know how to administer it at first. This compound of calomel, opium, and (when necessary) ipecacuanha, in order to

use. These symptoms have been supposed fatal; and they often are so because they have deterred from the free administration of purgatives: under their use, the heat of the skin, and the morbid force of the pulse abates: mild laxatives in these

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produce its full effect, should be given at *short and regular* intervals, so that the system may *constantly* be kept under the combined effect of the whole of the articles. Each succeeding dose, therefore, must be administered *a little time before the effect of the preceding has ceased.* Calomel in this form, except in a very few moderately torpid cases, where not previously used, is probably *never serviceable,* as an alterative, *after the first week;* nor, a few local inflammations excepted, even after the semi-critical change is produced, however early in the disease it may have taken place. This process is much assisted by infusions of serpentaria, and other aromatic and diaphoretic drinks, and the various circumstances, which belong to the proper moderate diaphoretic regimen. But if we are not called till near the end of the first week of simple fever, calomel should not be employed, except as a slow and moderate cathartic; for in this late stage, it is nearly impossible to touch the mouth, or to affect the system; and it is liable, when it has any influence, instead of diminishing, *to coincide with the existing morbid action,* and then *to aggravate* the very symptoms which it was intended to counteract.

"The minutest circumstances are often necessary to be observed, in order to obtain the full effect of an important article. If they are overlooked, its operation is defeated. Thus in *highly sthenic diseases,* calomel will not produce its alterative effects, unless the system is *first thoroughly reduced,* by depletion and evacuation. In like manner, in *the lowest typhoid diseases,* these effects cannot be produced, unless *the system is first raised* by alcohol and opium, or what is perhaps preferable, by capsicum, aromatics, and acrid stimulants. It is by no means intended, ever to produce complete ptyalism, or, strictly speaking, any ptyalism at all. In this case, as probably in all others, this effect is to be avoided, if possible. Not that any material or permanent evil is the consequence; but it is productive of considerable temporary disturbance, without being in itself of any service. The cupreous taste, the slightest distension of the gums, or sloughy whiteness, or erosion of their margin, and soreness of the teeth, the most moderate degree of the peculiar fleecy appearance of the tongue, and fetor of the breath, which are among the first visible effects of mercurials, will be amply sufficient. This is the state which it is desirable, the very low cases already excepted, to keep up *during the first week,* or till the sub-critical change supervene. By this plan, the patient is prepared for tonics, a week earlier, than by the common practice.

Before dismissing the subject of calomel, it is necessary to enforce one important point, with respect to the administration of this article, viz. That there is *no certain dependence* to be placed upon its use, either as *a slow and moderate cathartic,* or as an alterative, unless the patient will submit to an *appropriate diaphoretic regimen.* He must confine himself to his room, and in many instances to his bed, and at the same time, use tepid aromatic and diaphoretic drinks, light liquid food, such as broth, milk-porridge, arrow-root, or the lighter vegetable and animal, mucilaginous, and gelatinous preparations. Pediluvium, or warm-bathing, sinapisms, and in many instances, epispastics, are indispensable auxiliaries. Having completed the preparatory course, and *entered upon the tonic and supporting plan,* at least a week earlier than usual, we are enabled to carry the patient safely over the dangers attending the most important *critical periods.*

Although the main intention of these remarks, is to point out a method of treatment suited to the *first week,* or to the *forming* and *preparatory stages* of regular febrile diseases, as well as to demonstrate *the practicability of breaking them up,* or of producing a *resolution* at their access, and particularly to establish definite and precise rules for the use of calomel, yet, I cannot forbear making a few remarks upon the *method of support,* which it is necessary to pursue, during the continuance of the disease, or the *stage of exhaustion.*

Moderate doses of the *decoction* and *tincture of the bark,* given at short intervals, and when the skin inclines to be dry, combined with serpentaria, or similar diaphoretics, mineral acids, wine, and epecially Opium *in small doses, every three or four hours at farthest,* and even every hour, in the lowest cases, constitute the

cases have no effect. Frequently in typhus fever the stools are black, fœtid, and large, and are attended with the worst symptoms of the last stage, as low delirium, subsultus tendinum, dry and furred tongue, weak and feeble pulse. Purges freely

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most successful method of supporting the system. *In very low cases, diluted alcohol is preferable to wine;* and Fowler's mineral-solution, in doses from five to eight minims, or at any rate, in a quantity short of the nauseating point, should be administered every four or six hours. Where the bark is worn out, or when it is rejected by the stomach, this article is a most excellent substitute; but whoever uses it, without combining it with opium, will, most assuredly, be disappointed in its effects. Slow and moderate purging, (when it fails of removing the disease) is but a good beginning of the alterative process, and rarely is sufficient, of itself, to produce the semi-critical change, so that the patient can be profited by tonics, unless it is followed, a few days, by a suitable course of calomel and opium. Nor is the disease commonly more than half through, when the sub-critical change has commenced. No time, therefore, is to be lost. The supporting course is now to be entered on with decision, and pursued with energy and perseverance; for *if the proper time for administering tonics is passed by, there often arises such an irritability of the system, as in a great degree to preclude their use.* More inconveniences proceed from indecision on this point, than from almost any other. Besides, *the accidental symptoms* which are ever liable to be met with, at the *critical periods*, are to be treated with the greatest promptness. Vomiting, diarrhœa, &c. must be *immediately suppressed;* not by emetics and cathartics, but by full doses of opium, blisters to the stomach, and other auxiliaries. Metastasis of the diseased action to the brain, lungs, or any other vital organ, *admits of no relaxation* in the general treatment; but often requires *a vast addition to its force and strength*, combined with the most vigorous and extensive application of *blisters over the parts*, with other topical remedies. As soon as the brain is known to be much affected, the upper part of the head is to be shaved, and a large epispastic applied; and tincture of stramonium is often an important auxiliary. Charcoal, capsicum, and oil of turpentine may often be used with success, in tympanitic abdomen. The introduction of a tube into the rectum, frequently removes this troublesome symptom. The dangerous and troublesome coma, which often occurs in the last stage of fever, is more effectually overcome, and the counterfeit torpor, in this stage of low typhus, is more easily counteracted, by the regular administration of opium and alcohol, than by any other means whatever. Their occurrence is more rare, when these articles have been previously used, than under the common treatment. But to produce its full effect, it is absolutely necessary, that *each succeeding dose of opium should be administered before the exciting effects of the former have passed by.* Much attention is necessary to this subject. When managed in this way, opium becomes the most efficient and safe exciting power of the whole Materia Medica. By an unsteady and irregular administration, and at too long intervals, or in improper doses, it is, on the other hand, one of the most precarious. The true standard for the administration of opium, as a supporting agent, is to increase the dose, until the febrile irritation, restlessness and anxiety, are subdued, and tremors and subsultus controlled. In the severe cases, coma supervenes upon this state of irritation, to a much greater degree, where narcotics have not been employed; and when they have been previously used, and are abstracted, under the false notion that they produce this symptom, it is invariably aggravated. It is not the opium, but the manner of administering it, which produces disturbance and troublesome secondary effects. As a general rule, to overcome irritability, with subsultus, spasms, and its other various symptoms, opium should be given in *full doses*, at intervals of three or four hours; for when the dose is not sufficiently large to subdue, it seems to increase these symptoms. But when it is used as a supporting agent, it should be administered in *small doses*, once in two hours; and in extreme cases, it is sometimes necessary to repeat it every hour.

It may be proper also to remark, in this place, that where debility is attended with irritability, our principal reliance is to be placed upon opium; but where debility is attended with torpor, our dependence must be placed chiefly upon lyttae, capsicum, and other *acrid stimulants;* yet opium, in appropriate doses, is

given abate these symptoms, and invigorate the patient.* In the commencement of the fever, when the excitement runs high, the mercurial and saline cathartics are best.† Active purging also prevents retention of urine, which always aggravates the symptoms, and may require the use of the catheter: a slow dropping of urine from the penis sometimes deceives the patient, when the bladder is nearly ready to burst. In children this is to be particularly attended to: the protrusion and tumor of the hypogastric region will generally determine the necessity of the catheter. The accounts of attendants are not to be relied on, in this matter, as from its continual dripping they often snppose the urine is sufficiently evacuated when it is not.

Sometimes in mild continued fever, when the pulse is soft, a diarrhœa appears, which exhausts the patient without proving critical: after a purge of calomel and rhubarb, senna and manna, or epsom salts, it should be checked by the use of subcarbonate of potass, ℈ss. with eight or ten drops of laudanum; or ʒss of chalk occasionally with mint water, and eight or ten drops of laudanum, or by small doses of antimonial wine and laudanum, to determine to the surface.‡ C.

CORDIALS.

The great weakness which prevails in fever, naturally led to the employment of cordial and tonic medicines, more particularly wine, ether, camphor, musk, bark, and aromatics; but it is now generally acknowledged, that the indiscriminate use of stimulant remedies in fever, is highly pernicious; that they have a tendency to aggravate many of those local determinations, from which danger is chiefly to be apprehended; and, therefore, that their employment is to be regulated by circumstances, no less than that of bloodletting. The period of the disease, the particular situation in which it appears, its exciting cause, the age, constitution, and former habits of the patient, are of course to be taken into account; but we are chiefly to be guided by the *character of the symptoms*, and the *effects of the remedies.*

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essential in either case. Alcohol, mineral-solution, oil of turpentine, and a frequent succession of blisters, are beneficial in severe cases of both varieties.

But medicine, alone, is not sufficient to cure any protracted disease. It is indispensable that the patient should be regularly furnished with suitable food, which is both nutritious and easy of digestion. Gelatinous and mucilaginous preparations are far preferable to solid substances. *During the stage of exhaustion*, from half an ounce to an ounce or two, of broth, milk-porridge, or arrow-root, &c. should be taken a dozen times in twenty-four hours, *with the same regularity as the medicine.* Milk, with one third lime-water, is good food, when the bowels are too soluble. In convalescence, oysters, and the soft parts of shell-fish, answer the best purpose, for the stomachs which have been accustomed to them in health.

* Hamilton. † Philip, p. 263.

‡ When cough occurs in the more advanced stage of the fever, oppression, and tightness at the chest; mucilage of liquorice, with small doses of antimonials, and paregoric, will relieve by determining to the surface. Mucilage of gum-arabic; flaxseed tea; spermaceti ʒiss, rubbed up with the yolk of an egg, to which may be added ʒiiss of vinegar of squills, and v℥ of mint water, will form valuable expectorants.

When the stomach is nauseated, a few drops of laudanum and peppermint; or a draught of soda water; of seltzer water; or a solution of carbonate of potash, ʒii to six oz. of water; and after it a table spoonful of vinegar or lemon juice, will generally quiet it: a purge of ℥i glauber or epsom salts, with a gr. of tart. emetic, speedily operates as a purgative, and cures the nausea, when it depends upon an accumulation of morbid matters. C.

1. In the state of true collapse, marked by cold and clammy sweats, a "quick faint voice and indistinct articulation; respiration short, temperature variable; weak and sinking pulse, and pale urine; skin shrivelled; cough; fœtid perspiration; sliding down in the bed with the knees drawn up to the body;" feeble wavering pulse, oppressive breathing, the supine posture of the patient, and a moist, brown, "dry," and loaded state of the tongue, stimulants, especially wine or brandy, are not only beneficial, but absolutely necessary. Such symptoms are clearly indicative of a failure of the powers of life, and unless stimulants "and tonics" are duly supplied, in quantities proportioned to the exigences of the case, the patient rapidly sinks.

Great evacuations of all kinds are then improper; for a strong purge will often produce death: the bowels however should be kept moderately open.

Sometimes they become excessively loaded with fœces from neglect of purging in the first stage; inducing delirium, stupor, flushed face and a quick pulse; the use of purgatives, combined with tonics and cordials, are then valuable: as rhubarb, tincture of jalap, with quinine, whey, &c. and after the purgative operates, an opiate. Sometimes the stools in this stage are black, fœtid, and loose, with blood and slime: cathartics taken in the same manner relieve them. C.

BARK, &c.

Those cases of typhus which are accompanied by petechiæ, or the large livid blotches called vibices, in short, by what we have denominated the symptoms of putrescency, are benefitted by the steady and moderate exhibition of wine, bark, and aromatics; "particularly if the petechiæ are not of a scarlet, but dark brown colour when they at first appear; are attended with discharges of blood from the gums, nose, bladder, bowels, or skin; then evacuations of all kinds are hurtful, because the system is nearly exhausted."

The sulphate of quinine in doses of three or four grains every two hours; or the cold or hot infusion or decoction of bark, or of the serpentaria, are proper to support the strength in this stage, as they best agree with the stomach: They may be combined with the sulphuric, or muriatic and oxymuriatic acids in the dose of ten or fifteen drops, which will increase their effect: If the medicines disagree with the stomach, the infusions of cascarilla of columba, or of quassia, may be substituted:

Fowler's solution of arsenic in the practice of Dr. Ferriar succeeded in the last stage of typhus, when other tonics had no effect: It was prescribed during the fever, without regard to cough, dyspnœa, or any other local symptom: Dr. Thomas speaks highly of it; and I have seen it used in the Pennsylvania Hospital with the best effects:

Laudanum, infusion of orange peel, may be used to prevent these medicines affecting the stomach. These stimuli must be assisted by others which may be selected, according as they agree, as carbonate of ammonia in doses of three grains every two hours,—camphor dissolved in milk or reduced to powder by rubbing in a mortar, previously wetting it with spirits of wine, in the same quantity—ether—opium—or what is much better, camphor and opium combined. Camphor calms the low delirium, excites a glow on the skin, and gives a steady and cordial tone to the system. It may be given in union with the bark, and has little effect on the pulse. It was formerly given in Germany combined with vinegar. Musk is also a valuable remedy: like camphor, it gives tone without increasing the pulse or

heat of the system, which opium, wine, &c. are too apt to do. Castor was formerly much used; it is given in the dose of five grains every two hours:

Madeira wine in wine whey or with milk, may be given every two hours in the quantity of half a pint in twenty-four hours to an adult. Brandy and the stronger wines sometimes excite too much, and exhaust the powers of the stomach: beer, porter, claret, or cider, will then be useful: brandy, wine, &c. may be given in enema: In Tennessee, in the low state of typhus, this practice has been useful: A table spoonful of yest given every two hours, is also valuable: it nourishes, and its fixed air is tonic and stimulating to the system:

The diet should be composed of animal broths, sage, tapioca, arrow root boiled in milk, given in small quantities, and often repeated: in particular, the stomach should always have something in it, from the danger of excessive debility:

Fresh air in this stage is also highly tonic and invigorating. Dr. Hennen observed in Spain, that during sultry weather when typhus prevailed in the hospitals, that when the weather became cold, the sick were so invigorated, that even venesection became necessary, though before the lowest symptoms of typhus prevailed, which could only be treated by stimulants:

The sleep should not be interrupted except to administer the diet; to encourage it, porter, the tincture of hop, laudanum with camphor, will be proper. In this low state every thing that supports, and gently stimulates, is useful: Gestation in a carriage has succeeded in rousing and giving tone to the system, in the last stage. Friction on the limbs with the flesh brush; rubbing them with the warm hand, are useful: Exposure to cold air in rising, as it sometimes has produced a fatal chill, should be avoided, and after the convalescence has been established, it may produce a relapse with local determinations. The excessive use of stimulants may do so likewise: a few purges in that case, with a mild diet, and blisters to the seat of inflammation will generally effect the cure.* C.

There is a third class of symptoms which has been supposed to indicate the propriety of a similar plan of treatment; I mean those which denote irregularity in the action of the nervous power, such for instance as subsultus tendinum, picking of the bed-clothes, and a tremulous tongue. These are distinctly symptomatic of cerebral irritation, of a state which is indeed sometimes relieved, but not unfrequently aggravated, by wine and bark. If these symptoms are present along with a parched tongue, a hot and dry skin, and any degree of *sharpness* of the pulse, wine even in small quantity is generally hurtful. It is a state which may often be better combated by local bleeding, blistering, and laxatives. Wine is indeed at most times a doubtful remedy in fever, which should never be persevered in, unless the signs of improvement are very unequivocal.

In these cases we will always be safe by resorting to a middle course,—by the use of cold water to the surface, by spunging or sprinkling, when the heat is above 98° and if it be below, or about natural, instead of giving wine, by supporting the strength with decoctions of barley, tapioca, arrow root, milk and water, whey repeated in small and frequent doses: It is not true that the stomach will not digest in fever; the alvine evacuations under this plan become natural, the subsultus, picking of the bed-clothes, and delirium disappear, and even the necessity of purgatives is avoided, as the evacuations become regular: If local inflammations be present, they are not increased: The irritability of the system declines as the patient gains strength, and the mind and nervous system recover at the same time. Yest in this state of the system is highly useful. With regard to the use of stimulants in typhus, it may be laid down as a principle, that they should never be given

* Thomas and Good.

when the pulse is febrile, the skin hot and dry, with local pains, the debility increasing towards night with the fever: The above plan will always be found to be a valuable substitute, and should form the diet of typhus. The food should be given in moderate quantities, and often repeated. As the irritability of the system diminishes, to the diet may be added infusions of serpentaria, and of the bark: The serpentaria tea should be prepared in a stone jug closely corked to prevent the escape of its aroma, which makes it sit better on the stomach.

With regard to the use of cathartic medicines, by some they have been recommended in large and repeated doses: The practice, though supported by the great name of Hamilton, of Edinburgh, is too debilitating: The bowels should, it is true, be cleared of all unnatural collections of fœcal matter, but farther than this, the use of aperients should be avoided: It should be always recollected, that after the first depletion in the typhoid state, every further increase of the debility must be carefully guarded against; and that the strength is to be supported by nourishment of the simple and digestible character above mentioned.

In typhus fever often the stools become black and offensive with a great increase of the depression and debility; in this state, the use of laxatives are particularly necessary: for this purpose, rhubarb, with soda, magnesia, and injections will be proper, with the use of the above diet, which will assist the evacuation of the bowels, and render the stools natural. The absorption of this foul recrementitious matter, produces a bad effect; by filling the blood-vessels with a poisonous and unnatural matter, which should not lie long in the bowels without being evacuated. C.

2. The effects of all stimulant remedies are to be carefully watched. Even when most essentially required, as in the lowest state of collapse, they will sometimes occasion a degree of excitement, from which danger may be apprehended. If the tongue, under their exhibition becomes dry, and delirium increases, they should be immediately diminished, or altogether withdrawn. If the patient is upon the whole improving, this should satisfy us. Any attempt to accelerate his recovery by increasing the quantity of wine, will only risk his safety.

From the want of sleep, and restlessness which so generally prevail in fever, and which are so distressing to the patient, opiates might be expected to be useful, but experience tells us otherwise. In the early stages of the disease they are quite inadmissible; and even in the latter, their employment is often followed by an aggravation instead of a relief of the symptoms. Besides this opium frequently augments the heat and thirst, constipates the bowels, and increases delirium. In some few cases indeed, an opiate at bed time, as in the following form annexed is advisable; as for instance, when, after purging and local bleeding, great restlessness, "watchfulness and starting" continues, attended with a low muttering delirium, aggravated towards night.

℞. Mist. Camph. ℥i.
Tinct. opii gtt. xxx.
Liq. Antimon. tartar. gtt. xv.
Syrup. Croc. ʒi.
M. ft. haust.

If, on the following morning, the tongue appears dry and smooth, the opiate was probably injurious; if moist, it may safely be repeated.

These remarks apply to those cases, in which there is increased action. When there is a tendency to a typhoid or typhus state, small doses of opium combined

with nitre, with the citrate of potash, or the spiritus mindereri will excite perspiration, reduce the fever, and promote sleep at night. In the last stage of typhus, when debility prevails, opium and camphor combined are the most valuable assistants to calm and quiet the agitated nervous system; the camphor is valuable because it excites less than the opium. It may be used alone or combined with small doses of laudanum, when inflammatory action or local determinations forbid opium alone. In the old, the debilitated, and the weak, previous to their illness, it may be used with more propriety; when the disease also has been the result of a highly contagious atmosphere, or when the patient has lived generously, using ardent liquors as a part of his daily food; these cases require a more liberal use of wine and other stimulants. The disease occurring in autumn, particularly after a hot summer, in hot climates, in low and miasmatic situations, in wet and hot seasons, require a more liberal use of wine. The relief of the debility, the promotion of perspiration, increase of strength, all show the necessity of continuing it.

This view of the subject is confirmed by Pringle, who states that he used them merely to support the strength, till nature showed a disposition to perspiration; there was no intention of relieving the head, or forcing a sweat by them, as he observed, that it was entirely in vain to bring on a crisis sooner than the fourteenth day: The proof that wine or other cordials are used in too great quantities, is seen in the wildness of the eyes, or the voice becoming quick; these symptoms evince the approach of frenzy, and show that the stimulants must be diminished: blisters then are valuable, though before they have no good effect: fomentations of warm water and vinegar to the feet are also useful, and often produce in the delirium of these fevers, as great an effect as blisters: When the delirium is attended with a slow voice and without violent motions, the bark and wine should be given, without any other medicine, waiting till the crisis takes place for the solution of the fever, delirium, &c.: A plan either too heating, as that by cordials given early; or one too cooling, as copious bleedings, increased the delirium: in the whole course, therefore, of this symptom, we must be directed by its intensity, withdrawing all stimuli, and substituting depleting measures, or the contrary, according to its character.*

Pringle also used opiates with success in the decline of fevers, when the inflammatory symptoms were much abated, when there was no affection of the head, and when the patient, after long watching, believes he should be well enough if he could but sleep; care must be taken to prevent costiveness by the free exhibition of laxatives or clysters. C.

In particular states of fever, the efficacy of blisters has been long acknowledged, and several different explanations of the fact have been offered. They have been supposed to act as stimulants, or to have a power of relieving spasm, and they have accordingly been recommended by some at any period of continued fever. By others, they have been principally resorted to in the latter stages of the disease. Their good effects have been then traced to a principle of *revulsion*, and they have been chiefly applied by such practitioners to the calves of the legs, and the soles of the feet. It is now, however, generally agreed, that blisters are only useful in obviating those local congestions and inflammations which occur in the course of fever, and more particularly within the head, bringing on that state of cerebral irritation which is marked, sometimes by delirium accompanied with much restlessness and attempts to get out of bed, and occasionally by the opposite, but no less formidable, of *stupor*. Under these circumstances, great benefit is experienced from the application of a blister to the nape of the neck; besides which the

* Rush's Pringle, p. 278-9.

head should be shaved, and cloths dipped in a cold lotion constantly applied to it. In cases of local determination to any organ of the thorax or abdomen, a blister over the affected part will prove equally advantageous.

The propriety of blisters, as of other remedies in fever, is determined mainly by the pulse. In the inflammatory forms, after it has been reduced by general and local bleeding, blisters become advisable. They may be produced either by applying a decoction made by boiling for ten minutes half a pint of the spirits of turpentine, with half an oz. of powd. cantharides, over the part with muslin wet in it: It acts in half an hour, and prevents the increase of the symptoms by the irritation of the kidneys and bladder, a common effect of blisters. The skin may be inflamed and a blister produced by muslin wet with the volatile spirits of ammonia, applied in the same way—or by equal parts of nitric acid and water, cautiously laid on the surface, or by a fluid paste of mustard and water or vinegar, spread between two folds of linen well wet: these modes are speedy and therefore preferable to ordinary blisters.

There can, however, be no question that blisters applied to the wrists and ancles, and in some cases to the thighs, support life for many days, when it is nearly exhausted and flagging, as in the last stage of typhus: at all times when the fever is on the wane; when the legs are cold, these remedies will be found useful on the ancles and wrists. The turpentine decoction, or the common blister will be best from their permanent effects.

Blisters are particularly advisable, when there are local pains, as in the head; then a blister between the shoulders relieves them, after the pulse has been sufficiently reduced: a stitch in the side, or cough, is also effectually removed by applying the blister over it. Sydenham relieved coma with great effect by applying it between the shoulders. C.

In the progress of continued fever, some symptoms occasionally arise, which from their urgency, demand particular attention; but for the management of these, no specific directions can be given.

The milder forms of continued fever are often kept up by weakness in the last stage; the sulphate of quinine in small doses, as a grain every two hours; or the infusion of bark, with some aromatic, as orange peel should be given; also columba, and quassia; if no untoward symptoms result, as anxiety, stricture across the breast, head-ache, heat of skin, febrile excitement of the pulse, they may be continued: The mineral acids, the muriatic, the sulphuric, and the oxymuriatic made into a pleasant drink with syrup and water, are then valuable to excite an appetite and hasten the convalescence. The bark may also be given in substance where the quinine cannot be had. It should be given in the dose of ʒi every two or three hours; if it purges, four or five drops of laudanum may be taken with each dose. If it sickens the stomach, the plan proposed by Dr. Cartwright of giving it between two wafers made by dropping on a hot smoothing-iron a paste made of flour, and putting the bark between them, wetting their edges slightly, will be found to be convenient. C.

During the convalescence, the diet of the patient must be strictly regulated; but in the way of medicine, little else is required than an occasional laxative, and the exhibition of a light tonic, such as the infusion of cascarilla, bark, or columba.

Gentle exercise on foot; within doors at first, afterwards in a carriage or on horse back; and the cold bath, with frictions with the flesh brush will assist in establishing the cure: Removal to a high, well ventilated, mountainous country, will also be useful.

CHAPTER VI.

TYPHUS SYNCOPALIS.

Symptoms—Prognosis—Causes—Appearances after Death—Treatment.

SYMPTOMS.

It is necessary here to give some account of a variety of typhus which has appeared principally in New England, and other parts of North America.* Its distinguishing feature is the sudden debility, which prostrates the system; occurring either in fainting, symptoms of palsy, apoplexy, hysteria, concussion of the brain, cholera, or general and excessive weakness; without any appearance of re-action, throughout the whole disease. The symptoms are excessive, rapid, and destructive; the extremities are cold, the skin numb, insensible to the most powerful rubefacients and blisters: There is a feeling of great sinking at the epigastrium:†

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* "Typhus-syncopalis may be defined, *A Nervous fever‡ in which the stage of re-action is wanting, the torpid or forming stage and the stage of exhaustion being blended together, attended with pain in the head and vertigo, and paroxysms of gastric sinking;* and for the most part, with a cool skin and slow pulse, and an absence of all febrile smell. Petechiæ, eruptions, ecchymoses, general suffusion of the capillaries, coma, delirium, palpitation, interrupted respiration, numbness and insusceptibility to the action of ordinary rubefacients and epispastics, and *sinking after evacuations*, are much more common than in any other febrile disease. *By attending to these symptoms, it may be more easily distinguished than any other continued fever.* Coma or delirium may sometimes be so severe or so protracted, as to overwhelm or disguise every other symptom; or the attack may be so violent as to destroy life in a few hours; and in these circumstances, in sporadic cases there may be, with the inexperienced, some hesitation as to the nature and name of the complaint; but on the whole there is less liability to mistake, than in the diagnostics of any other acute fever with which we are in the habit of meeting, in the ordinary course of practice. Dysentery, cholera, cynanche, catarrh, cough, pneumonia, measles, rheumatism, gout, and even common typhus, are often complicated with it; yet there is always some prominent symptom by which it may be determined, when the *general affection of the system* is that of typhus-syncopalis."§

† There are two kinds, according to Dr. Miner. The most common variety of this symptom, was described "sometimes as extreme distress, sometimes as a painful sense of vacuity and faintness, sometimes as trembling or fluttering, sometimes as real pain and anguish, and at others, was declared to be utterly indescribable. During the existence of these paroxysms, the coolness and numbness of the skin,

‡ "No theory leads to more exceptionable practice than that, which supposes sinking typhus to be *originally* a gastric disease. This has been the cause of the death of hundreds, and converted hundreds of mild into tedious and protracted cases, and into spurious bilious fevers. Those physicians who avoid much vomiting or purging, and know how to use opium efficiently in substance, or by enema, are seldom much troubled with vomiting, and rarely mistake it for a gastric or bilious fever."

§ Dr. Miner on Typhus Syncop.

The stomach is either entirely insensible or excessively irritable; an erect position exhausts the patient; the pulse is irregular and variable, often full, when exhaustion is about to take place; evacuants debilitate, and suddenly place him beyond

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the lividness of the extremities, the feebleness of the pulse, and the indications of distress in the countenance, were much augmented. Sometimes, these paroxysms of sinking, were attended with palpitation, and often with spasms; though spasms, tremors, and subsultus were not uncommon in every stage. In the mild cases, these paroxysms of sinking occurred *regularly* in the morning; but in the severest, they were not confined to any particular hour of the day."*

"In many of those cases which were neglected, or treated with evacuants, or in which the early symptoms were not decisively and fully met and subdued by appropriate remedies, a peculiar and somewhat different, and usually irreparable sinking and exhaustion occurred *after a critical effort*, or in lieu of a crisis, on the third, fifth, or more commonly, on the seventh day. In a few cases, it did not occur till the end of the second or third week. Under such circumstances, in addition to the sinking in common with other cases, the respiration was interrupted and peculiar, and much resembled that of the dying, or rather that of animals (as is described) after a division of the *par vagum*, the inspirations occurring only at intervals of several seconds, and being usually long and full, while the expirations were so short, that the breath was parted with instantaneously. This *critical* sinking, in combination with morbid respiration, was often the first warning of danger to the patients and attendants, in the insidious cases, and it was almost invariably irremediable; for, although every symptom could be met, for a time, to the full extent, and although the most decided operative effects of medicine could be produced, and life often be prolonged for days, yet the weight of the disease could rarely be lessened, and, in one of the succeeding critical efforts, the same symptoms would almost inevitably prove fatal. In other fatal cases, the disease terminated in a deadly coma. Paroxysms of coma were periodical in some instances, as were those of sinking in others. The former description of sinking and anxiety, which was principally referred to the epigastrium, in distinction from the *critical*, may be termed *ordinary* sinking. It was usually relieved when taken in season, and treated with energy.†"

* Miner's Essay.

† "It is necessary to make further comment upon the two kinds of *subsidentia*, or sinking, or *l'abattement* as it is called by the French, as they are but little understood, and can *never* be realized by those who have not witnessed this disease in its severest form. *Gastric sinking* is the diagnostic symptom of typhus syncopalis, and is common to *every* case, where it is not disguised by coma, delirium, or prompt treatment. It also belongs to Good's cardialgia-syncopalis (or syncoptica) and is a variety of the *anxiety*, *anguish*, or *distress*, which all writers mention as belonging to the *last* stage of fever. It appears at *any* stage in typhus syncopalis. (1827.) These sinkings are so common, as to be properly reckoned among the diagnostics of ordinary cases. These symptoms have been the cause of much of the applause, and much of the reproach, that have prevailed, concering what is usually called *the stimulating practice*. The objections have almost uniformly come from those who have had little or no experience of the disease in its worst and most sinking varieties. In the paroxysms of *ordinary* subsidentia, the patient is sure to find relief by an efficient use of aromatic drinks, essential oils, alcohol, ether, or opium, assisted by external stimulants; and in the more urgent cases, *there is no other mode of relief*. The patient must use them freely, or he sinks for ever. The author is confident, that no instance of recovery from this disease, in the severest form, can be produced under an opposite method of treatment. In the more obstinate paroxysms, the quantities of some of these articles, that are not only borne with impunity, but that are imperatively demanded, are incredible to a stranger to such sinking cases. Every patient feels, and every bystander sees, their salutary effect. It is necessary to *keep up* this effect by the same articles *regularly and frequently administered*, though in much less doses than during the paroxysm, which may prevent its return in any alarming degree. In moderate cases, those fits of sinking when left to themselves, do not at first, destroy life, but each succeeding one reduces the vital powers so much, that a paroxysm of *critical* sinking soon supervenes, that instantly jeopards life. When this critical sinking does occur, the most decided practice is necessary to prevent instant death; and in defiance of every exertion, in the majority of cases, it is believed, it finally proves fatal. Life may usually be prolonged for hours, and sometimes days and weeks, but the system has received such a shock, that ultimate recovery is rarely to be expected. However, it is always our duty to support the patient as long as possible; and we succeed often enough in producing a new secretion of vital power, to prove, that desperate cases should never be neglected, and at the same time, to demonstrate the salutary effects of medicine in palliating, even when it cannot remove disease. Those who are ignorant of the extreme malignity of the disease, in general attribute death in those cases to the medication. If a physician suffers his patient to die in one of these paroxysms, he loses no reputation; but if with the most exquisite skill and judgment, he prolongs life for days or weeks, and the case finally fails, he is almost sure of being censured for his practice. When sporadic cases of this fever first occur, they are generally mortal, and the patient is usually said to *die of a fit* of apoplexy, of anginapectoris, of hydrothorax, of organic affection of the heart, or of some such fatal disease. He does often die, before sufficient re-action is produced to show that he laboured under a febrile disease. No fever requires greater nicety in adapting the treatment to the symptoms of individual cases than this, as some

the power of remedy: all these symptoms sufficiently distinguish the disease from the ordinary typhus:*

The disease sometimes attacks suddenly, running its course in from three to seven days; sometimes it is more insidious, not assuming an alarming character till the seventh day:

Dr. Gallup describes the disease as often attacking with local pain in some part of the system, back, side, &c. shifting from one part to another; sometimes a small portion of the surface is excessively cold and numb: Lassitude attacks the muscular system, followed afterwards by soreness in the flesh: Petechiæ resembling fleabites often occur; they appear of the size of a pin's head, in great numbers and in patches, giving the skin a dusky appearance and a forbidding aspect.†

Frequently the eruption resembles the measles, at other times it is vesicular; sometimes the vesicles are few, large, and the blisters contain an ichorous matter.

They are uncertain in their duration; the slight and partial ones soon disappearing: If they turn to a bright red the case is favourable: The eruption in the epidemic described by Dr. Gallup, occurred in about one in six cases; and did not appear to be an essential symptom of the disease; though it was named from it.

The same malady as it occurred in Philadelphia, I have seen sometimes, though rarely, attended with petechiæ.

According to Dr. Gallup, though he saw the disease often united with cholera and dysentery, the other viscera of the abdomen were rarely affected.

The countenance is generally placid, with often a flush upon the cheek: as the disease advances the countenance falls, the features are changed, become bloated, are of a dark sublivid hue, with deep brown patches and red eyes.

Great mobility and changeableness of symptoms characterize the disease: commencing generally with a pain in the forehead, between the eyes, with vertigo, with extreme lassitude, sinking and desire for rest, faintness, and sinking at the stomach, sometimes with chills, often without; it assumes in its other stages, like other epidemics, all the variety of affections which afflict the human body, and is generally to be distinguished by the prostration which characterizes all its forms; re-action seldom or never taking place after the disease commences.

Sore throat sometimes attends this fever, often not mentioned, however, without the attention is called to it.

Dr. North states that a great and surprising loss of strength, is a constant and prominent symptom of this disease; also violent pain in the head; the pulse is extremely variable, but always weak; it intermits, is fluttering or totally absent, is covered with a white coat, and in some bilious cases is of a brownish hue: Often the disease terminates by hemorrhagies from different parts of the system.‡

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* See Miner on Typhus Syncopalis, p. 19. 1825.

† Gallup on Spotted Fever, p. 233.

‡ The following case by Dr. Thomas Miner, will give an adequate idea of the danger of this malady.

"Sunday, January 28, 1816, one o'clock, P. M. I was called to visit, in consultation, J. N. Y. aged seventeen years. The first sight of the patient struck every beholder with horror. He was as stupid as a block, unconscious of any impression

of them are *very slight*, and require only *moderate practice*. The charge of indiscriminate practice is utterly groundless, and the general inference that is attempted to be drawn from *particular* cases, is entirely unwarranted. From a conversation of a few minutes with any intelligent physician, it is easy to ascertain, whether he has ever witnessed the *whole* progress of a very malignant epidemic. If he has not, or has only superficially viewed sporadic cases, or if he has only seen the disease in its mildest form, or in the intervals of the paroxysms of sinking, *all his analogies will fail him.* How a patient can sink irretrievably, sometimes on the first day of his disease, from a single emetic, cathartic, venesection, or enema, or even a draught of *cold* water, when at the same time, he might probably have been restored under proper treatment, is utterly incomprehensible, to most of such as have not *repeatedly* witnessed their effects. And on the other hand, it is equally mysterious, how doses of medicine, that in ordinary cases might endanger life, may be given with the utmost safety, and the most prominent advantage. It is equally incredible, that some cases may be trusted a week without the bowels being moved, and not only so, but that the slightest eccoprotic, if it could be made to operate, might destroy life. The fact that *coma and other typhoid affections of the brain, are more surely relieved by opium than any other remedy*, is equally incomprehensible. However, no facts in medicine are better known by the truly experienced, or are supported by more substantial testimony. The insusceptibility to the action of medicine in ordinary doses, in sinking typhus, compares with the same state in cholera of India and tetanus more than in ordinary fevers. In delirium tremens, a patient of professor B. of B. in one night, took a pound and a half of tincture of opium, and recovered!!! The author states this from very accurate information."§

§ Miner's Essay.

PROGNOSIS.

The degree of the violence of the symptoms generally determines the probability of danger: and if they be violent, yet, on exhibiting the medicine are easily controlled, there is little danger: Difficulty in swallowing, excessive irritability of

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on either of the senses, and so convulsed, that it required three or four men to hold him on his bed. His eyes were open, and rolled back, so far as to hide the coloured part, and his teeth were as firmly clenched, as in locked-jaw. His face, arms, legs, and body, were literally covered with spots, somewhat resembling, in appearance and colour, gunpowder shot into the skin; though in several places, they run together in patches, from the size of a cent, to that of the palm of the hand. The coldness of death pervaded the whole body, except the parts which had been warmed by external heat, and there was no pulse in either wrist. The convulsions, though they continued most of the time, would occasionally remit, so that there was, now and then, a slight relaxation of the jaws, sufficient to introduce the end of a spoon; and though he remained insensible, after his throat had been irritated, a few seconds, by some liquid, he generally swallowed the greater part of it. During these relaxations, he parted with his fæces profusely, and lay drenched in accumulated filth.

The previous history is as follows.

The patient, an apprentice to a smith, had been employed the Friday before, in a very warm shop, assisting in tempering sword blades. On Saturday morning, the weather being extremely cold, he went a mile from home, and was much chilled; but on his return, performed his usual labour in the shop, till near night. Towards sunset, he complained of severe pain in the head, sore throat, loss of strength, coldness, and that indescribable anxiety, which the sick term distress, in distinction from acute pain. His sister, who was his nurse, very properly administered an infusion of some aromatic herb, sent him to bed, and applied external heat, till free perspiration was produced. He seemed much relieved in the evening, and about ten o'clock, went to sleep. A man was left with him, to watch his symptoms, and furnish him with drink. He slept tolerably well, and nothing peculiar was remarked, except when he awoke in the night, he was thirsty, and drank, it seems, freely of *cold* drink. About four or five o'clock in the morning, he was found to articulate with difficulty and incoherence, and delirium was soon perceived. The spots were now discovered. A physician was called, who came about seven o'clock. An antimonial emetic was administered, which operated two or three times slightly, and soon produced the catharsis, under which he was *still* labouring, when I first saw him. Little else appears to have been done, except the application of a blister to the region of the stomach, with frictions, fomentations, external heat to the limbs and body, and occasionally, administering warm aromatic drinks.

Though the case appeared to be hopeless, I advised the use of laudanum, and brandy and water, and remained with him about an hour and a half, to watch their effects. During this time, the diarrhœa was checked, and a weak pulsation returned to the wrists. Being now obliged to leave the patient, I can only state, that he is said to have had no peculiar change of symptoms; but he became more and more exhausted, and died at one o'clock in the night, after an illness of about thirty-two hours."

REMARKS.

"I could mention another, that I witnessed, a few days afterwards, which proved fatal, in an hour and a half, after there was sufficient alarm to call a physician, and within six hours from the first apparent indisposition. No medicine, except twenty-five minims of laudanum, and warm mint tea, was attempted to be administered. The skin had a marbled, motley appearance, but no petechiæ. I saw a third, the same season, who died in eighteen hours. He had no spots. These cases were so palpable, and so little medication was employed, that no one suggested

the stomach, a coldness of the surface not to be overcome, great insensibility, coma, difficult respiration, are fatal symptoms.

Petechiæ, vibices, are always dangerous, but particularly in proportion to the darkness of their colour: Dr. North considers that dark coloured petechiæ, obstinate vomiting, a cold surface, little or no pulse, rigidity of the limbs, appearing in a few hours after the attack are dangerous: In many cases, after the patient was believed to be beyond all hopes, the symptoms of recovery took place. Dr. Gallup confirms the dangerous character of coma and petechiæ.

CAUSES.

These are the prevalence of cold and moisture; the debilitating passions; as grief, fear, fatigue, excessive stimulation; debility produced by other diseases: Cold is, however, the most frequent exciting cause.*

APPEARANCES AFTER DEATH.

The petechiæ sometimes cover the whole body, and diminish in the more prominent parts after death. The muscles exhibit a deeper shade than natural; the blood-vessels of the brain, more especially the veins, are very turgid: The brain exhibits signs of inflammation throughout its whole texture, adhesions between the brain and the dura mater, and also between the dura mater and the cranium: an increase of serous secretion, and also pus are found in the different parts of the cavity: and the veins are particularly turgid. Marks of inflammation also exist throughout the thorax.

TREATMENT.

The treatment according to Dr. Miner, is founded upon one general principle; every thing which wastes the vital powers must be avoided: Purging and vomiting generally exhausted the system, and were almost always fatal: Opium is the main stay in the treatment of this malady: It should be given with the purgatives, as two or three operations often debilitate the patient beyond recovery.

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that they were killed by the stimulating practice. Many others, to appearance, equally severe with the first case, could be stated, which were cured by a timely recourse to proper treatment.

Spotted-fever appears to have its seat and throne in the brain, to belong nosologically to the passive phlegmasiæ. It is attended with no spontaneous re-action, but has the forming and supporting stages blended together. This is manifest, by the greatest arterial debility, typhoid delirium and convulsions, paroxysms of *subsidentia*, and in a word, by every symptom, which is known to indicate an extreme deficiency or exhaustion of the powers of life.

By an energetic, exciting treatment, at its access, this disease is frequently broken up, within twenty-four hours. When we fail in producing a resolution, and only make such an impression as to moderate the violence of the symptoms, it usually continues seven, or in some instances, fourteen days, requiring the same course of practice, according to the urgency of the symptoms, as is demanded in the supporting stage of typhus.

One circumstance should be noted. Though the body, when coldness prevails, should be warmed by external heat, fomentations, vapour, or warm-bath, and it is desirable to produce and keep up a moderate diaphoresis, yet there is much hazard from excessive sweating. Indeed, it is not a rare occurrence, to find morbid sweating, through the *whole course* of any low, typhoid fever. The great difficulty in treating successfully such rapid diseases is, that the physician, too often, is not called till so late an hour, that he finds all the powers of life exhausted, and the patient already in the agonies of death."†

* North, 1811, p. 27.

† Dr. Miner.

Dr. Miner found that calomel joined with a diaphoretic medicine, if it did not operate for twelve hours, cured the patient effectually: Two stools, however, often detroyed the patient from the excessive debility they produced.

Often the bowels in this disease are not opened for a week, and without inconvenience to the patient: Tenderness, uneasiness, or slight pain in the abdomen, are the symptoms which indicate that the bowels should be moved, and for this purpose, the mildest laxatives are proper: Small doses of magnesia or enemata are recommended for this purpose; the opium in the mean time must be continued to support the system, as this last is the main and principal indication throughout the disease; salivation was of no use.

The quantity of opium given by Dr. Miner was 3 or 4 grs. in an hour, or half a drachm and even a drachm in substance in the course of twelve hours. This applies to the epidemic of 1823; there was, however, a mild variety which required only the use of a negative treatment, and to refrain from the use of hazardous or uncertain remedies.* He states that all who took opium invariably recovered. A soft and frequent pulse, with general weakness, renders necessary the exhibition of stimuli, of which wine, if the case be not violent, will be the most proper: It may be given sweetened with sugar, by the tea spoonful, and will lie upon the stomach when nothing else will: The quantity which can be taken in this way, is often enormous; as much as a pint has been given in the space of an hour with the greatest possible benefit. It may be given warm.

As much as four bottles of claret have been given in twenty-four hours with the most decided advantage: Dr. Bestor, we are told by Dr. North, gave two quarts of brandy and one quart of wine in twenty-four hours, and also twenty drops of the tincture of opium every two hours; I have seen the same quantity of brandy taken by a delicate woman in the space of twenty-four hours in this disease; the only rule necessary to be observed in regulating it, is not to intoxicate, but to keep up a continued stimulation, without regard to the quantity: The usefulness, however, of these excessive stimuli apply only to the sinking and exhausted state of the system, which, if not supported, soon ends in death: More permanent stimuli, as

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* "In the *mildest* cases, after *cautious* purging with calomel, the prescriptions were almost *negative*; such as, to avoid vegetable acids, cold water, muscular exertion, *an erect position* for any considerable length of time, much purging, and various other hurtful measures. [Whatever increases the peristaltic motion of the bowels, produces an evident tendency to *sinking*, even before the evacuation takes place; and some of the worst paroxysms of *subsidentia* ever met with, have occurred during the operation of the mildest cathartics, and even from a single enema. However, in the mild cases, moderate purging is proper. (1827.)] Numbers of cases might be stated, in which the patients, while labouring under an apparently moderate disease, from a false idea that they should gain strength by sitting up, have produced the most dangerous paroxysms of vertigo and sinking, some of which have been followed by death. Many of the severest cases did not admit of being moved from their beds for several days; since the slightest motion, or change of position, was liable to produce a severe paroxysm of sinking, and increase the exhaustion to such a degree, as to require hours to regain the ordinary strength. Some slight cases might be trusted to aromatic, bitter infusions, alone; others, to camphor and ammonia. In several of these, no calomel, or opium, or alcohol, or any active medicine, was needed or employed, provided all hurtful measures were studiously avoided. In many, a blister to the forehead, serpentaria, camphor and ammonia, compound tincture of cinchona, and opium in very small quantities, were all that were required."

"Profuse sweating from external heat was useless in the mild, and inefficient or injurious in the worst form of the disease, unless employed at the very access; and, in this stage, it could rarely be used with convenience. By the time a physician is called, it is generally too late for sweating to be of much service; though, when employed very early in cases of *sudden attack*, it is sometimes capable of breaking up the disease, especially in the torpid variety. Under such circumstances, it ought generally to be tried. The duration, severity, and mortality of this disease, depend more than any other, upon the early management."†

† Dr. Miner's Essay.

diet, soups, sago, &c. must generally be depended upon, and as the system rises must be substituted; otherwise if brandy, opium, &c. be alone relied on, the patient certainly sinks.

So great and rapid was the sinking that the most prompt and energetic means were necessary: Alcohol, capsicum, were serviceable; wine, bark, camphor, ammonia, were too mild to be useful in the severe cases: Fowler's solution was valuable when the head was much affected.

Of the external applications, hot bricks; heated wood; wood boiled in water; bottles filled with hot water; mustard; liquor ammoniæ; hot steam thrown into the bed; frictions with ardent spirits; capsicum; and oil of turpentine, were important agents: It was necessary to excite the skin by applying them previously to blisters; otherwise the latter had no effect.

Blisters were more particularly useful when applied to the vertex, forehead, temples, spine, epigastrium and extremities: to the head they were particularly valuable: and so decidedly beneficial were they, that the patients often asked for their repetition: applied near the bladder they relieved the torpor of that viscus so often attendant upon this malady: hot turpentine confined on the parts was very valuable: In a word, opium, alcohol, arsenic, aromatics, and external stimulants, comprehend the general outline of the treatment of this dangerous disease.

With regard to the propriety of sudorifics, in the sinking stage it was dangerous to excite a copious perspiration; the excitement and support of the system was the only judicious plan: but as soon as the strength was somewhat established, a slight perspiration had a good effect; and to support it, calomel in minute doses, opium, camphor, and ipecacuanha in combination were recommended, by Dr. Eiske; he used, however, at the same time, tonics to support the system when petechiæ were present.

So great is the tendency towards incurable sinking and weakness in this disease, that sitting up, the slightest motion or exercise, aggravated the symptoms; and confinement to bed, when the cases were slight, with small doses of calomel, serpentaria, columba, bark and wine were sufficient for their cure; and at the same time cold drinks, as water, vegetable acids, it was necessary to avoid. Fresh air, liquid nutritious diet, as arrow root, tapioco, sago, gruel, barley water, chicken soup, wine whey are proper. The mind must be kept perfectly easy and tranquil; encouraged and invigorated by the prospect of recovery, and the concealment of the danger of the case. The Peruvian bark in the form of decoction, infusion or tincture; fermented liquors, as porter, beer, cider, claret, port wine, and madeira, in the mild cases, answered well; they should be assisted by sulphuric, muriatic, and the oxymuriatic acids, given in the drinks in doses, sufficient to gently acidulate them.

A decoction of the twigs of the hemlock tree (Pinus Canadensis) has been highly recommended by Dr. North. It contains tannin, and turpentine; the latter as a cordial and stimulant has considerable power.

In the violent cases, when an active plan was pursued the patient got well in from three to seven days; when the practice was timid, and feeble, the patient lingered on for fourteen or twenty.

This disease appears to be more properly peculiar to winter and to cold climates: In Pennsylvania it occurred in the years 1813–14, and required the energetic plan just described, in the sinking cases: It however had analogies with the common typhous fevers, and required, in some cases, the use of purgatives to discharge the stools, which were black; they, then, were followed by immediate recovery: In all the stimulating plan was necessary; and it was the principal reliance in the treatment; venesection was fatal. It appears, indeed, in the violent cases to resemble exactly the cholera of India, and to require the most decided and active stimulation.

When the disease occurred in the form of mania, or delirium, it was generally curable; Hot applications to the legs, with warm aromatic teas, opium, camphor, wine, or ardent spirits, given in quantities sufficient to ease pain and support the pulse were found necessary,* particularly when it occurred in the cold stage.

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* North, p. 53.

When it happened in the hot stage, it was less dangerous and was treated by cold applications to the head. A blister to the neck was uniformly successful.*

When obstinate vomiting occurred, opium; camphor in a solid form; bladders of warm water; blisters to the stomach, wine and other cordials, should be given: When the system is febrile, the use of the neutral mixture of salt of tartar and lime juice; the spiritus mindereri; seltzer water, creta ppt. rendered aromatic with a little powdered cardamom seeds, and followed by a little diluted aromatic sulphuric acid made sufficiently warm, are recommended by Dr. North as being valuable.

The Fowler's solution also controls this symptom very effectually.

When it occurred in the form of colic, Dr. Bestor found that a blister over the belly, and an injection of three gills of yest, and a glass of brandy, followed afterwards by some laxative administered in the same way, was valuable: Purgatives were followed by death, from the debility they produced.

Strangury was relieved by the warm bath, when the system was above par; if cold and torpid, then stimuli should be given; of these, turpentine, and brandy, will be found useful.†

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* North, p. 53; and Dr. Miner's Essay on Typhus Syncopalis, for many excellent observations on this interesting subject.

† See Dr. Woodward's account of this disease as it appeared in Berlin, (Conn.,) in N. Eng. Med. Rev. for 1827, for many interesting facts on this subject.

CHAPTER VI.

OF THE PLAGUE.

Its nosological Character—Origin and History—Symptoms of the Plague—Mild Form of Plague—Effects of different Remedies—Of the Contagion of Plague—Its peculiarities—Circumstances tending to render the Plague epidemic.

ITS NOSOLOGICAL CHARACTER.

The Plague, classed by Dr. Cullen among the exanthemata, is yet, in strict nosological language, a continued fever closely allied to typhus, and therefore demanding notice more particularly in this place. It may be viewed, indeed, without over-refinement, as the link which connects the two great classes of idiopathic fevers. In its mode of propagation, it resembles the exanthemata. In its symptoms and progress, we shall trace an obvious resemblance to those of typhus.

ORIGIN AND HISTORY.

The historical details connected with this very singular disease are highly interesting. The ancients do not appear to have been acquainted with it, but it must be confessed that its origin and early history are involved in much obscurity. For many centuries past it has been *endemic* on the shores of the Mediterranean; and though it has occasionally shown itself in other latitudes, as at Moscow in 1771, and in this country in 1665, yet in that situation only is it at all times to be met with. Grand Cairo may be considered as the great *nidus* of the contagion of plague, and from this point, at particular seasons, it spreads with a malignity scarcely to be estimated. The interest with which such a disease must at all times be viewed, has been much heightened of late years from the circumstance of its having appeared in our own settlements (in 1813 at Malta, in 1816 in the Ionian Islands,) and been subjected there, as well as in Egypt in 1800, to the observations of

our countrymen. The symptoms of the disease, the peculiarities in the laws of the contagion of the plague, the circumstances which appear to favour its diffusion, and the consequent appearance of the disease as an *epidemic*, are the points to which my attention will in this chapter be principally directed.

SYMPTOMS OF THE PLAGUE.

A feeling of great languor and lassitude ushers in the attack of plague, which for the most part happens toward evening. There is always a cold stage, though it is seldom of long duration. Heat of skin, head-ache and giddiness succeed. The pain of the head is referred to the temples and eyebrows. They appear heavy, dull, and muddy. The expression of countenance changes in a remarkable manner. Sometimes there is a wild and furious look; sometimes a look claiming commisseration, with a sunk eye and contracted feature. The most striking of all the early symptoms of plague is the *staggering*, and the sudden extreme prostration of strength. A strong tendency to void the urine is generally noticed. The stomach is very irritable, and rejects almost every thing presented to it. The tongue is white and moist. The bowels are sometimes torpid, and at other times loose, the evacuations being always highly offensive. The speech faulters. The pulse is at first small, hard, and quick; but after the appearance of buboes it often becomes fuller and softer. It is sometimes intermittent. In point of frequency, its average may be stated at 100. The heat of skin is seldom very intense. The head is occasionally perfectly clear and collected. At other times, stupor occurs immediately after the formation of the hot fit. Some cases of the disease are ushered in by a violent fit of mania. The greatest indifference with regard to recovery prevails, and is always reckoned a most unfavourable symptom.

After one, two, or at furthest three days, pains in the groins and axillæ announce the formation of *buboes*. These pains are often highly acute, and unless speedily followed by the swelling of the gland, the patient dies delirious. In women the axillæ, in men the groins are chiefly affected.* Carbuncles appear at the same time, but indifferently on all parts of the body. Petechiæ and vibices are much more frequent than carbuncles, which it appears do not occur above once in twenty cases. The fatal termination is sometimes preceded by violent hæmorrhages from the mouth, nose, or intestines.

The duration of the disease is very various. A few cases are on

* This detail of the symptoms of Plague is abstracted, by permission of Sir J. Macgrigor, from the official reports of the epidemic of 1816, transmitted to the Army Medical Board by the officers in charge of the Plague Hospitals in the Ionian Islands.

record, where the patient died within a few hours from the invasion. To many it proves fatal during the first paroxysm or period, which includes the time from the evening of the attack to the close of the following night. The third and fifth days are, however, upon the whole, those of the greatest danger. The former is the usual period of the appearance of bubo; the latter, of the abatement of the febrile symptoms. If the patient survives the fifth day, and the bubo is fully formed, he may be considered as nearly out of danger. The convalescence indeed is always very tedious, from the extreme debility which the disease leaves; and the patient's life is not unfrequently again put into imminent hazard from the occurrence of gangrene in the extremities.

Such is the train of symptoms which characterizes this disease. To form some idea of the extent of the mortality which it occasions, I may mention, that out of 700 persons attacked by it in the district of Leftimo in Corfu in 1815, seventy only were saved, and 630 died. It is curious, however, to observe, that occasionally this very formidable disease assumes a totally different character. The *mild* form of plague is not peculiar to any families, or classes of persons, or districts, or periods of the epidemic. It is more commonly met with towards its decline, but it is observed occasionally even from the very first. Buboes form in this variety of the disease about the usual period, generally with a good deal of inflammation, and go on to suppuration. Carbuncles and petechiæ, however, are never observed to attend it. It is marked by the same set of febrile symptoms as characterize the malignant form of the disease, but they are all milder in degree. It terminates occasionally by a critical discharge, but does not appear to require, or to be at all effected by, any kind of medical treatment. A few cases have been recorded of plague appearing in the form of buboes, without any constitutional affection.

A circumstance of some importance, as tending to point out the analogy between the plague and other forms of continued fever, has been taken notice of by Sir James M'Grigor, in his Medical Sketches of the expedition from India to Egypt:—I mean the effect of season, ventilation, and peculiarities of soil, in modifying the character of the symptoms. The cases of plague which occurred in the cold months of the year, were marked by an inflammatory diathesis. Those which were sent in from crowded hospitals, were attended from the very first with low or malignant symptoms. Those which occurred when the army was encamped near the marshes of El-Hammed, showed a kind of remittent or intermittent type.*

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* Subjects who have inhabited a cold latitude and have never been accustomed to the debilitating influence of heat especially accompanied by the operation of atmospherical infection, suffer a more inflammatory degree of plague, and all the other diseases of tropical climates. The excitability of such bodies seem to be

Some dissections have been made of the bodies of persons who have died of the plague, but they afford little or no instruction. The few morbid appearances noticed, were met with in the cavity of the abdomen.

EFFECTS OF DIFFERENT REMEDIES.

In the malignant form of plague, every variety of treatment has been tried, but with so little effect, that it may be considered as a disease nearly beyond the reach of medicine. The violent headache which occurs during the first twenty-four hours, seems to point out the propriety of blood-letting, and it is recommended by the general custom of Turkish practitioners; but in the hands of English surgeons it proved of no avail. In the cases in which it was tried it did not appear, however, to make matters worse. The blood first drawn was generally sizy, but never afterwards.

Where mercury can be brought to affect the mouth, it appears to be of some service, but it is seldom that sufficient time is afforded for the specific effect of the remedy. Ether and laudanum are valuable medicines in allaying the irritability of the stomach. Wine and opium are of no use during the violence of the disease, and bark can seldom be retained. This is much to be regretted, for wherever it can be made to stay on the stomach, even in those severe cases where carbuncles and vibices appear, its good effects are conspicuous. Camphor, bark, and wine are given with much advantage during the period of convalescence. Emetics, purgatives, and the cold affusion have been tried, but it does not appear that they are of any particular service. Diaphoresis can seldom be produced, owing to the disposition to vomit; but wherever it can be procured, the symptoms seem to be mitigated by it.

Great attention is always paid to the local treatment of the buboes. They seldom go back, and it is usual, therefore, to employ means with the view of accelerating their suppuration. For this purpose the Turks are in the habit of applying the actual cautery, but it did not answer in the practice of our army surgeons. The irritation occasioned by it was excessive, so as sometimes to hasten the patient's death. Blisters and poultices are certainly preferable; but upon the whole, it is quite obvious, that as little can be done in the way of surgical treatment in the plague, as by internal medicines.

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accumulated: hence in the United States we find many persons who have experienced several attacks of yellow fever. The intervention of a cold winter effaces the impression of the cause engendered in summer: hence we never become perfectly constitutionally acclimated like the inhabitants of uniformly warm latitudes. All causes that occasion a chronic debility and thus impair the general nervous energy, prepare the body for a feebler action of the heart. P.

OF THE CONTAGION OF THE PLAGUE.

The general resemblance which plague bears to those malignant forms of typhus fever, which are occasionally witnessed in cold countries, must be abundantly obvious. The great distinction between them lies in the occurrence of buboes; in other words, in the tendency which plague has to affect the lymphatic system. This line of distinction however is so broad, that plague is to be viewed as a continued fever, allied indeed to typhus, but differing from it in the important circumstance of having its origin in *specific* contagion. That the plague is a highly contagious disease cannot for a moment be made a matter of dispute; but some physicians have maintained, that it is not a fever *sui generis*, generated by a specific contagion, but only an aggravated form of typhus; in support of which opinion it has been argued, that cases of typhus complicated with buboes have sometimes been observed in this country.* This idea, however, is entertained only by a few, and the doctrine of a specific contagion in plague, is that which is now generally received. Its laws have been investigated with some accuracy, and the following seem to be the most important of those which have hitherto been ascertained.

1. The *latent period* of the contagion of plague, or that between communication with an affected individual, and the appearance of symptoms, varies in different cases. It is scarcely ever less than three days, and it seldom exceeds six. Instances indeed are recorded of the disease not appearing until the tenth day, but these cases are rare.

2. The contagion spreads to a very small distance only from the body of the patient. The consequence of which is, that the disease is seldom, if ever communicated except by actual *contact*.

3. The dead body does not communicate the disease so readily as the living. This appears to be well understood in Turkey; but that the contagion is sometimes received from the dead body, cannot, I apprehend, be doubted.

4. The contagion of plague is readily imparted to *fomites*, in which it may lurk for a very long time, more particularly if secluded from the air.

5. Re-infection is occasionally observed, but, upon the whole, is not common. The individuals throughout Turkey, who are employed about the persons of plague patients, have, with very few exceptions, undergone the disease. Sufficient iustances, however, are met with of persons taking the disease a second time, and even dying of the second attack, to make all who have previously had it, cautious in their intercourse with the affected.

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* See Minutes of Evidence taken before the House of Commons on the Question of Plague. 1819.

6. Plague, like the small-pox, may be taken by inoculation. The experiment has been tried in several instances, but in none has it succeeded in mitigating the disorder. Dr. Whyte in 1801, and Mr. Van Rosenfeldt in 1817, paid with their lives the forfeit of their temerity. The former died on the fourth, the latter on the second day of the disease.

Plague I have stated to be endemic in Egypt; and both at Cairo and Constantinople cases of the disease are almost always to be met with. In other words, they occur *sporadically* in those places. While the English army were in Egypt in 1801, cases of plague were continually occurring; but the judicious regulations which were adopted, prevented the disease from spreading, and the troops suffered but very little from it. At Malta however in 1813, and in the Ionian Islands during the years 1815–16, the plague raged epidemically; and from very early times it has been observed, that at particular seasons the plague disseminates itself with extraordinary malignity. To this nothing can give any effectual check but the enforcement of severe measures by the strong arm of military power. At Marseilles in 1720, at Messina in 1743, at Grand Cairo in 1759, and on various other occasions, when the plague was suffered to advance without any such control, the ravages which it committed were of incalculable magnitude. The establishment of a cordon around the whole of the affected district, the rigid seclusion of families, the immediate removal of all suspected cases into quarantine, and of all decided cases to the lazaret, are the preventive measures of most obvious importance. By these, promptly and vigorously exerted, the extension of the plague in the Ionian Islands has been several times, in the course of the last five or six years, prevented; and it is now no longer questionable, that it might in the same manner be effectually checked in every part of the Turkish Empire.

CIRCUMSTANCES TENDING TO RENDER THE PLAGUE EPIDEMIC.

Many inquiries have been instituted with the view of determining, if possible, what the circumstances are which render the plague epidemic at certain seasons. Some particular constitution of the air is generally supposed to occasion it; but what that is, never has been, and probably never will be ascertained. The extremes both of heat and cold are said to be unfavourable to the propagation of plague, but this opinion must be taken with some limitations. The plague raged in summer at Malta, in the winter months at Corfu. Nor is it clear, that it is upon any peculiar state of dryness or moisture in the atmosphere that the phenomenon depends; though indeed there is a popular belief all over the Levant, that the heavy dews which begin to fall about St. John's day check the advance of the plague. To this circumstance is attributed the curious but well ascertained fact, that though the disease had been previously

raging in the town, the inhabitants may after that day leave their homes and mix in society with comparative security.

It is a common remark in the Levant, that the advances of the plague are always from South to North. When the plague is at Smyrna, the inhabitants of Aleppo handle goods without any precaution, and have no fears of contagion. When the disease, on the other hand, is at Damascus, great precautions are observed, and all the Frank families hold themselves in readiness to *shut up*, or to leave the town. An epidemic plague, therefore, nearly always begins at Grand Cairo, spreads to Alexandria, and from thence through Syria to Smyrna and Constantinople.

The seeds of the plague being always present in Turkey, if it were not for these peculiarities in the laws of its contagion, that country must have been long since depopulated. Whether the genuine Levant plague could spread in this climate, is a point upon which physicians are not agreed. The general opinion is, that it might so spread under particular circumstances; and therefore, that the quarantine regulations established by the Legislature are absolutely necessary for the protection of these countries.

1. The plague is a fever which owes some of its terrors to the timidity and ignorance of physicians: The author says that out of 700, 630 died, in Corfu: Sydenham tells us, that out of a number of persons, in the plague, who were bled almost to fainting, in Somersetshire, not one died.

2. Like other remittents, it personates all diseases.

3. Like the common summer fevers, it is not contagious; like them, it begins, increases, and declines with the summer, the season of putrefaction: Sydenham confirms this statement; so does De Mertens: like these fevers, also, it is arrested by frost, by removing their cause—animal and vegetable decomposition.

4. Any other cause, which stops this process, will also suppress the plague; thus, the season of the dry winds from the desert arrests this disease in Asia Minor, because they prevent putrefaction by their want of moisture. Other reasons prove it not to be contagious.

5. The houses in Turkey, as those in London were before the introduction of manufactures, are filthy and miserable: Erasmus tells us, that the houses of the poor, in England, about the time of the plague, were mean hovels, with ground floors, covered with rushes; the receptacles of the refuse of their meals, of beer, meat, &c. and of the excrements of dogs and cats; they remained there for years, till a hot season took place, when the putrefaction of this colluvies spread far and wide the poison of this fatal disease. De Mertens describes the hovels of the poor, in Moscow, among whom it principally raged, as being of one story, with a ground floor, in which they lived in great numbers, very much crowded together: he also states, that only three of the nobility, a few of the principal citizens, and three hundred foreigners of the common class fell victims to it; the great mass of the sick, who lived in these wretched hovels, were of the lowest order; of whom from eight to twelve hundred died every day from the first to the fifteenth of September, when there were but 150,000 people in the city; from this, an estimate may be formed of its excessive destruction among the most helpless class of people. The facts on this subject are numerous.*

These circumstances, taken together with the fact, that, since the people have become more attentive to cleanliness, it has never appeared in Europe, show that, like common remittents, it is the result of vegetable and animal putrefaction.

6. Besides, Dr. Hodges states, that after the great plague in London, the people

* See Hosack's Thomas, p. 990, *et seq.*

returned and lived in the houses, and slept in the beds, from which the sick had been removed, and which had not been cleansed, without taking it.*

7. If it arose from contagion, where would it stop? it would appear in the cities of Europe, as it did formerly: Why does not the cotton of Egypt now produce it in Liverpool? De Mertens mentions, that the poor in Moscow were, during the winter, the woollen clothes of the sick, after the plague had disappeared, without taking it. It would never cease in the places where it is endemic, for the same practice of buying and wearing the clothes of the dead prevails in Turkey, and yet as soon as frost appears the plague disappears, uninfluenced by the breath or the contact of the sick and dying. The season, which favours the putrefaction of domestic filth, appears to be every thing, and contagion nothing in its production. It may be said, that the fact of its inoculation producing death is sufficient to establish the contagious nature of the disease: It should be recollected, that the inoculated were exposed to the atmosphere of the district in which the plague prevailed, both before the experiments and after them, and some of them were physicians continually employed about the sick, so that it is impossible to draw any conclusion from them, whether the disease be contagious or not.

De Mertens says, that it was taken from the air, from the contact and the breath of the sick. If it was taken from the air, how can it be certainly demonstrated that it is taken by contact also; since the effluvium from the body, dead or alive, must be diffused in an atmosphere about the person, and must operate before contact can take place? The conclusion, then, with regard to its contagion cannot be so rigid as strict philosophy requires: The same observation applies to the breath; how can we conclude, certainly, that the breath conveys it, when the effluvium in the room, which may arise from putrefying vegetable and animal matter, is also present: the whole reasoning is general and crude: the fact, that it rises, increases, and declines, as other remittents do, proves that, like them, it has the same origin; that is, vegetable and animal putrefaction. The idea that the remittents of summer are contagious always prevails in the early periods of observation, before the facts have been clearly discriminated: thus agues were said to be contagious by Cleghorn; also the yellow fever, by those who have not seen much of this frightful disease; but where it has been accurately observed, as time, now, in the case of the ague, has enabled us to do, the idea is not at all generally admitted: The reader, however, will be better satisfied of the truth or fallacy of the arguments on both sides by consulting the able essays of Dr. Rush on the contagion of yellow fever, and that of Dr. Hosack on the same subject.

The doctrine of contagion deprives the sick of attendance, and they die often for want of it: It disarms and petrifies physicians with fear at the very name of the plague, and they do not exert themselves to do as much as they can for the sick. The contrary belief has the opposite tendency: It renders us active in removing the causes which produce it, and fearless in relieving the sick. The belief that the plague is a fever, gives to physicians the use of their reason; they prescribe for it according to symptoms, and will no doubt discover a plan of treatment which shall be as successful as that of any other disease: the plague has been cried up from the earliest ages, as the most terrible of all diseases: Physicians have never much exerted themselves in its elucidation; as far as the records go, it resembles in its origin, and nearly in its nature, the fevers of summer of a high grade; and there can be no question that like them, it may be prevented and often cured. With regard to the treatment of the plague, it is worthy of remark, that the author states, that sudorifics and mercury always did good; Sydenham is a great advocate for bleeding; taken largely, to fainting, it cured many persons: In applying this remedy to a disease so violent as the plague, the remarks of Dr. Rush, formerly quoted, in p. 94, 5, 6, should be recollected, and applied with judgment; at first, when the disease is inflammatory, and in robust and youthful constitutions, of which cases are described by Samoilowitz and others, bleeding will be proper, and it should be taken in the decided way mentioned above: in this stage, and kind of the plague, the disease attacks the brain, as is shown by the incessant headach,

* Pringle on the Plague, 1722.

and the furious delirium, from the onset,* continuing for one or two days, and then leaving the patient feeble and tranquil, death following in twelve hours. The remedy must act immediately, otherwise it is of no avail: This variety resembles in its course the yellow fever: It also sometimes attacks the heart: The rules for bleeding, to produce its effects in the highest degree, should be applied thus: we should take it the patient being in a standing posture, and the blood should be permitted to run till fainting is completely produced; and when the perspiration, which follows it, takes place, it should be encouraged by some diluent drink: The plague, it should be recollected, personates every variety, degree, and kind of disease, and the practitioner should be on the alert to make use of such remedies as the state of the patient indicates.

The sudorific plan, after bleeding, Sydenham considered as of the greatest importance; and he cured by it many cases, in which bleeding was not submitted to. As mercury, according to the author, was valuable, the plan of salivation by cinnabar fumigations should be used as more rapid; lately it has been tried, in this country, by Dr. Jackson of Northumberland, (Penn.) with results so decided and sudden, that its value cannot be too highly appreciated; for an account of which, see the article yellow fever: The value of this mode rests upon the fact, that medicines applied to the skin extensively produce nearly the same effect, as when administered by the stomach; a person immersed in carbonic acid, even though he does not breathe it, is as certainly affected with the stupor and drowsiness as by respiring it: mercury, laudanum, and most medicines, may be applied with success in the same mode. C.

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* See Samoilowitz, quoted by De Mertens, p. 75. London, 1779.

CHAPTER VII.

INTERMITTENT AND REMITTENT FEVERS.

Train of Symptoms in the Paroxysm of an Intermittent—Primary Types of Ague—Of the Remittent Fever—Consequences of Ague—Prognosis—Causes of Ague, predisposing, and occasional—Of Marsh Miasmata—Treatment of Intermittent Fevers—During the paroxysm—During the Interval—Bark—Arsenic—Of the bilious Remittent Fever of warm Climates—Mode of Prevention of these diseases.

TRAIN OF SYMPTOMS IN THE FIT OF AN INTERMITTENT.

Intermittents are readily distinguished from every other form of idiopathic fever by their occurrence in paroxysms, each of which may be considered as an epitome of a febrile disease, exhibiting in the course of about eight hours all the stages of fever—its rise, progress, crisis, and termination in the recovery of health. This circumstance has contributed to give to intermittent fever a large share of the attention of pathologists. By an accurate investigation of its phenomena, they have endeavoured to arrive at a knowledge of the nature of febrile action, and have imagined they could apply to the more varied appearances of other diseases, those general views which the consideration of agues suggested. Distrusting in some measure this principle, I commenced the inquiry by a sketch of the more frequent, and, in this country at least, far more important subject of continued fever.

The propriety of the epithet *Intermittent*, may be questioned on pathological principles. If we analyze the morbid condition of body subjected to the operation of the remote cause, we will discover, that although all the more prominent symptoms are generally abated after the three stages noted by the author, there is not an entire cessation of the morbid phenomena, but a deceitful temporary quiescence. The nervous system is weaker than it was previous to the paroxysm, the action of the heart depending upon it is weaker: and hence the accumulation of blood in the large veins, particularly those of the portal circle, continues to increase, while the action of the heart diminishes in the same proportion till the heat on the surface diminishes for want of action, and a chill is the consequence. As the chill increases the excitability accumulates, and as that of the distended

veins is communicated to the heart the hot stage follows necessarily. There seems to be no necessity for calling upon the imaginary energies of the vis medicatrix naturæ to make out our issue in accounting for the phenomena of the disease. This position may be illustrated by an appeal to the state of the functions during the remission of the symptoms that constitute the three stages. The pulses are usually softer, and often more frequent than they are in health, though they are sometimes slower, more perfectly natural, as will be manifest to the touch of an experienced finger. The tongue is changed, either in the quantity or quality of its secretions. The surface of the whole body is deprived of its healthful appearance for want of circulation in the capillary vessels, and the condition of the abdominal viscera is not that of entire quietude. In many cases the difficulty, with which the faculties of the mind are exercised, shows that the wound first inflicted on the sensorium, by the remote cause, continues to impair its functions, till an entire exemption from its action shall have been effected. If we are not deceived, in our rationale, it would be more consistent to say, that it is not the intermittent, but the *remittent* type, that is in nature the archetype of all the family, originating in marsh miasmata, for, even between the paroxysms of a quartan, however mild, the eye of scrutiny can always find some fault in one or more of the viscera.

It is impossible for a person, who never witnessed the variety of forms, into which intermittents are diversified in warm climates, to estimate their character or calculate their danger in the first instance, or their deplorable consequences. The latest nosologists have named more than two hundred modifications; and almost every physician, extensively concerned in their treatment, must have observed fifty others that never have been noticed even by Senac and Alibert, whose excellent works have aided us so much in leading to a proper discrimination of the symptoms of ataxique intermittents. We will remark generally, that under certain conditions of climate, this disease appears of every degree of fever and inflammation, from the mildest quartan ague to phrenitis or apoplexy, which succeed to it, as symptoms. P.

The symptoms which occur in the paroxysm of an intermittent fever divide themselves obviously into the *cold*, the *hot*, and the *sweating* stages; in the course of which, those changes happen in the state of the several functions of the body, which have been already (page 44) in part alluded to. The hot stage is usually attended with nausea and vomiting, scanty and high coloured urine, a hurried breathing, considerable headach, throbbing of the temples, confusion of thought, or even delirium. A moisture at length breaks out on the face and neck, which gradually extends over the whole body, and the febrile symptoms then rapidly diminish. The pulse sinks to its natural standard; the feeling of weakness goes off; the heat of skin, headach, and thirst abate; the appetite returns; the secretions are restored to their healthy condition, the urine depositing a *lateritious* sediment. There is considerable variety in the duration of the paroxysm. It is, upon an average, about six or eight hours.

PRIMARY TYPES OF AGUE.

After a certain interval, the same train of symptoms is renewed, and the period of their recurrence gives what is called the *type* of the fever. From very early times three primary types of intermittent have been observed—the Quotidian, the Tertian, and the Quartan, in which the febrile paroxysm completes its revolution in the respective periods of twenty-four, forty-eight, and seventy-

two hours. Of these, the most common is the tertian. Several irregular types of intermittent fever have been taken notice of by authors, such as the double tertian, the semi-tertian, and the double quartan, but they are not of frequent occurrence.* There is only one other form of the disease which it is necessary to mention here. Under certain circumstances, the febrile symptoms, instead of ceasing entirely in the interval between the paroxysms, abate only to a greater or less degree, and this constitutes the REMITTENT type of fever.

In the course of the disease, it is frequently observed, that the type changes; tertians and quartans into quotidians, quotidians into intermittents. Under more favourable circumstances, the remittent shows the character of an intermittent; and, generally speaking, the change into a type of less frequent repetition, indicates an abatement in the severity of the disease. Physicians have remarked, that the tertian type of fever has its invasion in the forenoon, the quartan in the afternoon, and the quotidian in the morning. The quartan, which has the longest interval, has the longest and most violent cold stage, but upon the whole, the shortest paroxysm. The hot fit of the tertian is comparatively the longest. The quotidian, with the shortest interval, has at the same time, the longest paroxysm.

Upon what particular circumstances the type of intermittent fever depends, has never been ascertained; but, that climate and season have great influence over it, and also over the general character of the symptoms, cannot be disputed. Vernal agues, generally, assume the tertian type, and are marked by an inflammatory diathesis. They are, however, mild, and usually run their course quickly. Quartan agues prevail, chiefly, during the autumn and winter months, and they are the most obstinate of all the forms of intermittent fever.†

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* The double tertian with a fit every day, the alternate fits being similar, or with two fits on one day and one on the next: The double quartan, with two fits on the first and fourth days only, or with a fit on every day except the third: The triple quartan with three fits on the fourth day; or with a fit every day, every fourth fit being similar.‡ The forms only become interesting as they show the nature of the disease, which is less powerful in proportion to the length of the intervals: It therefore determines the necessity of energy in our practice, and the danger of the disease becoming remittent, fatal or otherwise. C.

† That they are difficult to treat is clear, and for several reasons. They are occasionally protracted from habit only, and require a strong impression to be made to break habitual associations. They are often attended by a small, tense pulse in cold weather, without any strong mark of local disease, and can only be cured by blood-letting. The most frequent source of difficulty consists in hepatic or splenic affections, which can only be removed by mercury. Whether these affections are primary or consecutive, the disease is cured by changing the condition of these viscera.

The affection of the liver or spleen is occasioned by want of proper evacuations in the early stage of the disease, and are often occasioned by the premature use of tonics, especially the bark. In many cases, the intermittent will recur, irregularly as long as such local affections exist. P.

‡ Thomas.

The tertian is the least obstinate form of intermittent fever; for it has neither the extreme of excess exhibited by the cold stage in the quartan form, nor of the hot stage in the quotidian; it is therefore more manageable: but from the fever being considerable it is of all other forms of the disease most likely to become malignant, when extreme heat, combined with bad air, marsh miasmata, &c. increase the febrile diathesis of the system:* In this climate, remarkable for its warm and relaxing weather, after excessively cold winters, the quotidian, tertian, or the remittent form, is most apt to occur in the spring, a remark which applies also to England, and the latitude of the United States north of us;† the quartan form is seldom observed in the spring, in the middle latitudes of the United States; Its cold stage has been known to last for fifteen hours;‡ its general duration is about two hours: in no part, south of Philadelphia, can the quartan be said to be a frequent visiter, as the climate is too warm; on the Mississippi near New Orleans it is unknown: It is an important variety of the disease, from its tendency to produce obstructions of the liver and spleen, dropsy, fatuity, &c. and from its extreme obstinacy; circumstances which render it necessary that stimulants, high and dry air, as well as the ordinary tonic plan should be applied: the old bear it badly, as also the debilitated; children on the contrary bear it well,§ from the excitable state of their blood vessels.

In England it has been observed, by Sydenham, that the quotidian or tertian forms occur most commonly in the spring; and that they cease spontaneously when the fall sets in, from the influence of the cold weather; tertians, also, which occur in the fall cease in the following spring: these facts are of importance, as no disease is so likely to alarm the patient from its obstinacy, and fatality, when protracted, and the constitution is much weakened by frequent attacks: The climate of our seacoast so much resembles that of England, that its diseases have similar characters: another remark made of these diseases in Britain also applies here: their spring intermittents, the type being the same, are less liable to become continued, to be accompanied by bilious symptoms, and followed by dangerous consequences than the autumnal, and they are also less disposed to return,‖ and the reason is, that the heat of the summer debilitates the system and renders it less liable to bear up against disease, and favours, by the generation of miasmata during the heat, the stronger forms of this disease. The vernal agues require depletion; the autumnal stimulation; the former it is always easy; whereas it is often impossible to stimulate the latter sufficiently, when the system is much reduced.¶ C.

Great as is the influence of season, it is yet inferior to that of climate. The remittent type occurs, almost exclusively, in hot countries; but to form an adequate idea of the extent to which the symptoms of ague can be modified by climate, it is necessary to consult the works of Dr. Cleghorn and Dr. Lind,** authors of the highest repute on the subject of intermittent and remittent fever.

Every thing which illustrates the character of these fevers is important, as it enables the practitioner to direct his treatment properly, increasing or diminishing the power of his remedies accordingly: When the fits of the quotidian lengthen, or those of the tertian reduplicate, it approaches the continued form; the protraction of the fit, in the tertian, is the most probable evidence of its tendency to reduplicate, the cold fit becoming shorter and milder, and the hot fit increasing in length and severity: The quartan rarely becomes continued; when it does so, it is by a reduplication of its paroxysms; and the new paroxysms are always of the same type of the first fever.†† The change of these fevers is always thought to

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* Philip, p. 69.
† Ibid. p. 69.
‡ Grant's Obs. quoted by Philip, p. 70.
§ Ibid. p. 71.
‖ Philip, p. 69.
¶ Philip, p. 69, 70.
** Cleghorn on the diseases of Minorca, 1751. Lind on the Diseases of Hot Climates, 1768.
†† Philip, p. 73.

be favourable, as the number of fits diminish in a given time; thus if a quotidian becomes tertian; a tertian, quartan; it is in proportion favourable, and *vice versa;* the violence and the duration of each fit being less, it is of course more favourable.*

CONSEQUENCES OF AGUE.

An ague, sometimes, continues, particularly in cold climates, to affect the body for a very long period, without producing any permanent derangement of function or structure; but this is a very rare occurrence in hot countries. There the continuance of ague induces inflammatory affections of the thoracic or abdominal viscera, dysentery, cholera, dyspepsia, or chronic *obstructions* of the liver and spleen. The tendency of ague to produce an enlarged state of the spleen has long been observed, but the cause of this peculiarity is as yet undetected. From these organic derangements results, as another consequence of ague, *dropsy.*

The inflammations which are united with ague, as when it occurs in the form of rheumatism and dysentery, are generally the result of sudden vicissitudes from heat to cold; the inflamed state of the stomach, which sometimes accompanies it, as in the epidemic of Copenhagen, and that described by De Haen, appear to result from the action of miasmata evolved by a hot sun: It is more particularly in autumn and spring that the complications of an inflammatory cast are observed; The indurations of the liver, of spleen, and dropsy, are the legitimate results of the disease itself,† and are owing to no extraneous cause excepting that the debility of the patient appears to favor them.

Death happens generally in the cold stage of the quartan, and in the hot stage of the other varieties; If the perspiration is profuse it may happen during that stage also, and even in the remission, when the preceding paroxysm is violent:‡ The morbid appearances observed after this variety are various; sometimes no trace of disease is left: The liver and spleen are often found enlarged, hardened, sometimes soft; the former even putrid: The spleen resembles in some cases a bag of congealed blood: The pancreas is found enlarged, ulcerated, and oftener indurated; Bile is found in great quantities in the intestines, the gall-bladder turgid: The stomach, omentum, duodenum, and mesentery are found inflamed and sphacelated.§

PROGNOSIS.

No general prognosis, in intermittent fever, can be given, which is not qualified by reference to the climate, in which the disease appears. In this country, and in Holland, ague is not a disease of danger; but at Sierra Leone, and along the neighbouring coast, it is scarcely exceeded in malignity by any known disorder. Season, also, as I have already stated, affects the general prognosis. It is influenced, in like manner, by the previous duration of the disease. An ague, which has been present a considerable time, has so far rivetted itself in the constitution, that its removal becomes tedious and difficult. Relapses, under such circumstances, are frequent, and tend materially to injure the constitution. An ague is more

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* Philip, p. 74.
† Ibid. p. 75–6.
‡ Ibid. p. 83.
§ Ibid. p. 93–4.

or less dangerous, in proportion as it is complicated with more or less of permanent derangement of the function, or structure of an organ. Enlargements of the spleen, from ague, are sometimes removed, but they require great vigilance on the part of the practitioner.

This phenomenon, which is so troublesome to the physician, so vexatious to the patient, and often fatal in its consequences, is probably occasioned by a process similar to that which gives occasion to hepatic affections which more frequently terminate in dropsy, dyspepsia and inflammation of the mucous membranes of the intestines. The quantity of blood sent to those viscera in a state of debility gives rise to venous congestion, which by distension acts as a stimulus to the heart, which puts the arteries of the viscera into a state of secreting action. If this condition of the circulation be not immediately removed, the product of vascular action, (which is supposed by some to be febrile, but is more probably sui generis according to the peculiar organization of the part,) becomes an organized membrane, which is known by the name physconia. This state seems not to take place at first, but, unless the secreting process be interrupted, a chronic action ends in this state or in dropsy. The enlargement of the viscera is sometimes diminished by a sudden copious deposition of fluid in the cavity of the abdomen. The secreting process, in which dropsy consists, is occasioned by the extension of inflammation from the viscera. It sometimes spreads to the mucous membrane of the intestines, and assumes the dysenteric form, but when dropsy is the result, the peritoneal vessels are implicated, and thus ascites is the consequence. These enlargements of the liver and spleen may act by pressing on the cava, or veins. The existence of the other varieties of dropsy admit of a similar explanation. P.

Agues, particularly as they occur in hot climates, are lastly to be judged of in reference to prognosis, by the *kind* of symptoms present, and by the *degree* of their violence.

1. From the state of the brain: great dejection of spirits, or anxiety, coma, lethargy, snoring, convulsions, or delirium, are unfavourable; the fevers of Hindostan, which commence with the latter symptom, are particularly fatal.

2. Of the senses. The pupil of the eye, turned inward and downward; false vision; insensibility of the retina to light, shown by an immovable iris; deafness, are also unfavourable.

3. Face. Eyes shut and mouth open; dejected or ghastly expression; bleeding from the nose and colliquative sweats, are bad.

4. Bowels. Hard and tumid belly, with a swelling of the tonsils, and painful state of the hypochondria and epigastrium; difficulty of swallowing, with a foul state of the fauces, mouth and tongue; an immoderately dry, a black, or a sodden and parboiled, or a white slimy and gelatinous state of the tongue, and pain about the upper orifice of the stomach, portend great danger.* Involuntary discharge of fœces, at the same time the belly very much swelled; black vomit; vomiting attended with great anxiety, giddiness, utter dislike to food, with great debility and without relief, are dangerous symptoms; as also a colliquative diarrhœa, with black discharges.

5. Heart and respiration: quick, frequent and fluttering pulse; with a pale, shrunk, and contracted state of the skin; a slow and regular pulse, attended with coma, are dangerous: a very rapid, full, strong and frequent pulse is so likewise, though it is more easily controlled than the foregoing symptoms.† The respiration panting, anxious and hurried, also sighing and groaning, are bad symptoms: hiccup and interrupted breathing, loss of speech, or great change in the voice, are so likewise.

6. Urine. Dark, depositing a black or brown sediment, at the same time that the eyes are suffused with blood, also an involuntary discharge of urine are dangerous.

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* Philip, p. 80. † Ibid.

7. Skin. Partial, cold sweats, blotches like the stings of nettles, coldness of the skin, also its insensibility, shown by flies settling on the lips and eyes, and cadaverous perspiration are unfavourable.

8. General character of all the symptoms. Long intervals, and short fits are, in proportion, void of danger; a quotidian is most dangerous, a quartan least so.* The fits becoming milder are favourable: in general the mildness of the fits, rather than the completeness of the interval, give the better criterion of safety.

9. Diarrhœa, vomiting, coma, &c. or any of the bad symptoms above enumerated, continuing during the remission, are dangerous: Cutaneous eruptions, as the small pox, miliary eruptions; salivation; herpes or ulcers on the lips or ears; profuse warm sweats are favourable, and often remove the disease.† If the intermittent be complicated with the symptoms of apoplexy, epilepsy, or any other disease, the prognosis is to be taken from that, which distinguishes these diseases.

Any cause of debility is dangerous; age, intemperance, debilitating chronic diseases are bad precursors, the intervals becoming longer, malignant symptoms subsiding, the patient more easy in the intermission, youth, temperance, the disease being of short duration previously, are favourable. C.

CAUSES.

The circumstances which predispose the body to an attack of intermittent fever have been detailed by authors with great minuteness, but there are only a few which are of any practical importance. Certain states of the air favour the disposition of the body to receive ague, rivet it in the constitution, baffle us in our attempts to cure the disease, and induce a tendency to relapse from the application of slight causes. Of these, the most remarkable are the concurrence of a cold with a moist state of atmosphere, the prevalence of an easterly wind, and the night air. Of the last of these, it is highly important, in a practical point of view, to appreciate the full influence. Dr. Lind, whose opportunities of observation were very extensive, lays much stress upon it. He urges the danger of sleeping, or remaining all night in aguish situations; and in his Essay on the Diseases of Hot Climates, illustrates this by many apposite examples.

Weakness of the body, whether owing to a poor and unwholesome diet, long watching, fatigue, severe evacuations, or previous diseases, augments the disposition to ague. Hence it is that it prevails with so much greater frequency and virulence in camps than in any other situations; particularly after a severe campaign, when the men have been hard worked, and exposed to great privations. There is reason to believe, that the disposition to take ague is affected by certain states of the mind; anxiety and inactivity increasing it, while hope and confidence, and whatever can excite the energy of the mind, lessen the susceptibility. An army is generally most free from ague while actively engaged in military pursuits.

The last circumstance which deserves to be mentioned in an enumeration of the predisposing causes of ague, is *habit*, or the

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* Philip, p. 81. † Ibid.

tendency which previous attacks give to a recurrence of the complaint. In this circumstance, intermittent fevers differ from continued, where one attack lessens the liability to a second; but it is a principle in pathology, which, though inapplicable to continued fevers, is yet found to influence the phenomena of several other febrile diseases; sore throat, for instance, erysipelas, and dysentery. So powerful is its effect in ague, that very slight causes are sufficient to renew the paroxysm, when long habit has left a predisposition in the system. It even serves to give an intermitting character to other diseases.

MARSH MIASMATA.

The great and important *occasional* cause of intermittent fevers are exhalations from soil, especially from marshy grounds, called by physicians MARSH MIASMATA. It is certainly a curious fact, that this pathological principle, so obvious, and so important in its practical tendency, should have been unknown to, or at least unnoticed by the older medical authors. Sydenham seems to have had a glimpse of it, but he could not have seen it in its true light; for, in his fifth chapter, he attributes agues to the ebullition of spirits and viscid juices. Lancisi is the original writer on marsh miasmata.* We are still far from being fully acquainted with all the circumstances upon which the production of ague depends. It is presumed, however, that the miasmata arise from the combination of earth and moisture with putrescent vegetable matter. Moisture alone, though ever so abundant, will not produce ague, for it is a rare disease at sea, even upon the foggy banks of Newfoundland. When the marsh is covered by water, agues are less frequent. Of the exact nature of these miasmata we are ignorant; but some points have been noticed with regard to them, which it will be proper to advert to.

The most elevated part of a marsh being always the healthiest, it is imagined that the miasmata are comparatively heavier than atmospheric air.. There is reason too to believe, that they cannot be wafted by currents of air to any great distance from the spot where they were generated, but on this point some differences of opinion have lately prevailed. The calm months of the year being the most productive of agues, it is reasonable to suppose, that the miasmata are most powerful when concentrated, and that diffusion by a brisk wind renders them comparatively inert. Culture and proper draining prevent their formation, and hence it is that intermittent fevers are so much less frequent in England at present than they were formerly. A very short exposure to the exhalations of a marsh is sufficient to affect the system. Travelling through the

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* His treatise is entitled "De Noxiis Paludum Effluviis, 1717."

Pontine Marshes has often been followed by an attack of ague. There is considerable diversity in the period which elapses between exposure to marsh miasmata, and the invasion of the disease. It sometimes does not exceed a few days, but there is reason to believe that the *latent period* has occasionally extended to several weeks, or even months.

Miasmata produce various effects, which exhibit modifications necessary to be noticed. 1. The inhabitants of marshy situations are seldom longlived; thus at Peterborough, in Virginia, it is said they die at the age of twenty-one. In some parts of Georgia fifty is the extreme period of human life.

2. When moderate in degree, miasmata produce intermittents; when more concentrated, remittents; thus, in Jamaica, in the most healthy seasons, the fevers are intermittent; in the rainy and other unhealthy seasons remittent.* The ague appears, for this reason, in cool seasons, as spring and autumn, and in temperate latitudes; remittents in summer, and in tropical countries.

3. Sudden changes, from cold to hot weather, favour the production of intermittents:† Thus, in Holland, cold and wet weather in autumn, after a very hot summer, renders agues more general and more malignant: Here the cold acts as an exciting cause, bringing into action the miasmata. Cold damp nights, succeeding hot days, produce the same effects: moisture and cold singly have no agency in producing agues, for it is observed that moist and mild winters in England are the most healthful; and at sea these diseases do not appear; they are not found also in high latitudes, when the temperature is below 50°. The circumstance that soldiers, encamped in woods, take these diseases, is explained by the miasmata generated in these situations: In hot climates, wooded shores are particularly dangerous; a few hours exposure is sufficient to induce the most violent fevers.

4. The nearer to the ground, the greater is the danger: Thus, Pringle observed, that in Holland soldiers on the ground floor were more liable to agues than those upon the second story; those upon the third less than those upon the second. The same is observed of the plague in Aleppo.

5. Woods are thought to intercept the pernicious effluvium; an important circumstance in choosing a site for encampments,‡ dwellings, &c. C.

But though it cannot be disputed, that the miasmata of *marshes* are the most frequent and important exciting causes of intermittent fever, still it would be impossible to deny that it has others. Febrific miasmata may unquestionably arise, under particular circumstances, from almost any soil; and the disease which they excite has, I believe, in nearly all cases, a tendency to exhibit the phenomena of *intermission*, or at least of very well marked *remission*. Persons residing in very healthy parts of London, are occasionally attacked by intermittent fever. In the time of Sydenham, agues were common in every part of the metropolis. To the great attention which is now paid to the sewers, we are, probably, in a considerable degree, indebted for the present healthiness of the town, and particularly for our exemption from ague. The occasional occurrence of the disease, therefore, at a distance from marshes, is not to be a matter of surprise. Agues prevail extensively in certain districts, where there are no marshes; but then it will always be found, that there is something equivalent to a marsh. There is either a subsoil of such a nature as does not

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* Philip, p. 97. † Ibid. p. 98. ‡ Ibid. p. 101.

allow water to percolate easily through it; or there is an extent of wood, impeding thorough ventilation, and the action of the sun's rays; or there is a total inattention to drainage and culture. In one or other of these ways, we may be able to explain the prevalence of ague, in the uncultivated parts of America, and in many parts of Italy and Sicily, particularly the neighbourhood of Florence, Rome, Naples, and Syracuse.

These *peculiarities of soil* are not merely the occasion of *agues*, but they serve to modify the character of continued fever, and of any other febrile disease which may happen to occur in the district. This principle in pathology we have already had occasion to allude to, when treating of continued fever. They give a tendency to *exacerbation* and *remission* in the symptoms of the fever; and it is not improbable, that many cases of what might be considered genuine remittent fever from marsh exhalation, are, in fact, cases of common continued fever from cold, modified by peculiarities of soil.

TREATMENT.

Before entering on the method of treatment, in intermittent fevers, I may shortly advert to this question of the relation in which they stand to continued fevers. It is contended by some, that intermittent and continued fevers are closely allied in their nature; that the operation of their exciting causes is in every way similar; and that the same treatment is applicable to both. There are pathologists, on the other hand, who maintain that intermittent and continued fevers are *essentially* different from each other, and consequently that there are *essential* differences in the principles of their treatment. Our knowledge of the pathology of fever is hardly sufficient to authorize a *decided* opinion of the speculative question at issue, but it is certainly better for the student to view them as *distinct* classes of disorders.

It has been made a question whether agues ought to be cured. An idea has prevailed in many aguish countries, that there was something salutary in the fever. Boerhaave himself, a physician of great genius, was misled by this prejudice, and not satisfied with the negative merit, that agues do no harm, and may therefore be suffered to continue, speaks of their positive advantages.* These opinions no longer prevail; and the only question which they now suggest is, whether, under certain circumstances, it may be proper to allow the *type* of the fever clearly to develope itself before bark is given.

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* Cæterum, nisi malignæ, corpus ad longævitatem disponunt, et depurant ab inveteratis malis. BOERHAAVE. *Aphor.* 754.

Though the opinion, above expressed, is certainly true, yet notwithstanding, after the influence of diet, exercise and medicine, together with the change probably produced by the disease, it is certain that persons after a long attack of the ague improve much in their general health; yet as intermittents are often mortal, or end in incurable chronic maladies, they should undoubtedly be arrested as soon as possible, excepting (in the opinion of some) in certain cases, such as where chronic diseases, as mania, epilepsy, cutaneous diseases, dyspepsia, gout, asthma, palsy, have long afflicted the patient; then, they contend, that as intermittents have sometimes cured them, the experiment of slowly altering the system may sometimes be tried; with what justice, experience, as yet, is not sufficiently ample to prove: a feature of this opinion, more important in a practical point of view, is the propriety of curing an ague at once, or the postponement of the use of remedies for some time: The latter was the opinion of Boerhaave, but as hepatic and splenic congestions, and jaundice, are the results often of only a few fits of ague, it is necessary to cure it at once, and in doing this there will be no danger, if V. S. purgatives, &c. are properly employed. C.

Another erroneous notion respecting the treatment of agues has frequently been avowed; namely, that their management requires little or no exercise of professional skill. So far is this from being the case, that agues often baffle the best directed exertions of our art. They become complicated with other diseases; their symptoms are modified by climate, season, and habit of body; nor can their treatment be properly adapted to these different circumstances, except under the guidance of pathology. It is true, indeed, that the hypothetical views of authors, regarding the proximate cause of intermittent fever, give us no assistance whatever in determining the treatment; but the pathology which is subservient to practice, is altogether of a different character. The practice in agues, then, it may be observed, is to be regulated in many respects by the same principles which direct us in the treatment of continued fever.

In considering the method of cure, in intermittent fevers, their tendency to spontaneous termination must be borne in mind. Hippocrates, in the very dawn of medical science, took notice that tertians, particularly in the month of July, often terminated, without the aid of medicine, within five, seven, or at most nine revolutions; and modern experience has confirmed the observation.* Mild vernal tertians will frequently go off spontaneously; but though this tendency is to be kept in view, that the practitioner may feel he is working with nature, and not against her, it is by no means to check his efforts to put a speedy period to the disease.†

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* Vide Cleghorn on "the Epidemical Diseases of Minorca," page 205.

† A spontaneous termination of intermittents is a rare occurrence, and scarcely happens, except in one special condition of the system; and this might have been the case with Hippocrates, although he does not mention the fact. When an intermittent has appeared in autumn, and is suspended in winter, it very frequently recurs in April, May or June, and sometimes seems to be cured by the renovating influence of heat. This happens in June and July, and sometimes in May, if the temperature be unusually high. This will not be a fortunate termination of the case, if the abdominal viscera are implicated in the diseased action. P.

TREATMENT DURING THE FIT.

The treatment of ague divides itself into two parts, the palliative and the curative; in other words, the treatment *during* the paroxysms, and in the intervals *between* them. During the paroxysm, the object of the practitioner is to hasten its different stages, and to relieve urgent symptoms. In the interval, the indication of cure is to prevent its return; and this either by *strengthening* the body, or more properly, by producing such an effect upon it, and particularly upon the nervous system, as may prevent the developement of fever. As we are altogether unacquainted with the manner in which marsh miasmata produce agues; so in like manner must we profess our ignorance of the exact *modus operandi* of our febrifuge medicines.

In some agues no treatment whatever is necessary; thus, when a person comes out of a miasmatic to a pure air, it disappears without the use of medicine: The agues of Delaware are cured by the air of Philadelphia; Sydenham mentions that the intermittents of the spring are often rendered more obstinate by bleeding and purging in England, and that it prolongs them to the autumn; the old saying of King James, that

> "An intermittent in the spring
> Was physic for a king,"

though perhaps exaggerated, shows at least the tendency of agues to a spontaneous termination in that climate, and the necessity of withholding medicine rather than administering it: The same author states, that a quartan taken by a person who has had it before, though long since, terminates spontaneously by a few fits, of whatever age or constitution he may be;* Some moderate evacuation in vernal agues, as a vomit followed by an opiate; a sweat, or a few enemata, may be used, if the patient will not be satisfied without taking some medicine.†

In the cold stage, stimulants, warm diluents, and the pediluvium may be had recourse to.

The patient may be put into a warm bed with bottles filled with hot water, applied to his ancles, thighs, and kidneys; or rubbed with a flesh brush till a glow is excited on the skin. Lying in the hot sun, during this stage, has a good effect: this is a plan which may be useful where the other means cannot be had. The drinks should be hot, but not stimulating, as they endanger the safety of the patient, in the hot stage, by producing too great excitement: cordials, stimulants, tinctures, spices, &c. are therefore to be avoided.

The shower bath has been advised to hasten the termination of the cold stage, but without sufficient evidence of its efficacy. In debilitated cases, it would be certainly dangerous; in the robust it might probably answer: but I would by no means advise it, though I have heard of cases in which it has been used successfully: If it operates by the shock produced by the sudden affusion, a shower bath of water as hot as the patient could well bear it, would produce this effect, without the danger of increasing the chill; but of the usefulness of this measure I have no experience.

Emetics are used with the view of bringing on the hot fit; They should be given soon after the beginning of the cold stage; and for this purpose tartrite of antimony, given in the dose of six grs. to two quarts of warm water, will be proper, drinking half a pint every ten minutes till it operates freely; it produces vomiting and a free discharge of the bile in the cold stage, where vomiting is proper, and

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* Rush's Sydenham, p. 36–7, note, &c. † Ibid.

when the hot stage comes on it purges freely; a mode of evacuation best suited to the relief of the fever.

If there should be delirium or coma, a mustard poultice, applied to the back of the neck, should be prescribed; and if at the same time the head be hot and the feet cold, the pediluvium in addition will be useful.

Dr. Munro mentions a case in which the paroxysm consisted of a succession of chills, without being followed by a hot fit: the cold bath in the intervals, and cordial tonics during the fit, cured the patient.

In the hot stage, cold acidulated drink, and saline diaphoretics are proper; of these, the following are the most advisable:

Spiritus mindereri, ℥ss. every half hour; or ten grs. of salt of tartar, in a table spoonful of vinegar, at the same interval; ten grs. of nitre with 1-6th of a gr. of tartar emetic, or a gr. of ipecacuanha, will answer; with tepid diluting drinks, as warm chamomile, or eupatorium (perfoliatum) tea; lemonade; a drink acidulated with elixir of vitriol; or barley water with vinegar; vinegar whey; a solution of nitre in ʒi. to the pint of linseed tea. Excessively stimulating articles should be avoided in exciting perspiration during the hot fit, particularly in violent plethoric and inflammatory systems; and when the liver and spleen are affected. The use of some of the above drinks in these states are particularly valuable, for instance, the eupatorium, from its purgative effect: active and direct depletion is in these cases always advisable.

The preparations of antimony, as James' Powder, or the tartrite, combined with small doses of opium are valuable, when assisted with diluent drinks, and a warm bed. The James' powder, combined with calomel, according to the original practice of Dr. James, is a good medicine: The Doyers powder does not answer so well,* not, however, as has been alleged, from the circumstance that it contains opium, for this drug given in the hot fit of intermittents and remittents, in which the action is not too high, produces a perspiration.

Two practices however of a peculiar nature have been recommended in this stage of the disease, which require particular notice. The first of these is the employment of blood-letting; and much controversy has taken place as to its propriety, even from the time of Celsus. We have the assurance of Pringle and Cleghorn,† that in warm climates and seasons, it is a safe and proper practice, rendering the intermission or remission more complete, taking off that inflammatory diathesis which counteracts the beneficial effects of bark, and removing those pleuritic and rheumatic affections, and those symptoms of congestion in the brain, which are sometimes complicated with ague. The blood drawn in the hot fit of an ague frequently exhibits the buffy coat.

Bleeding in the hot fit without regard to quantity till the reaction is reduced, is advised by Dr. Cooke of Virginia; after it purgatives act more easily, and the bark has a better effect: violent local pains, a strong inflammatory diathesis, a full hard pulse indicate it strongly. It relieves this state, when purges have no effect, and sometimes entirely cures the disease: Dr. Cooke even recommends the warm bath or emetics, when the pulse is low in the hot stage, preparatory to bleeding; which is then drawn largely with the happiest effect.

The fits are rendered shorter, it abates the fever, delirium, pain in the head, bowels, limbs and chest, and the profuse sweats: Without it, the fever becomes

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* Philip, p. 113.

† Pringle on the Diseases of the Army, page 200. Cleghorn on the Diseases of Minorca, page 197.

obstinate and the bark dangerous from its stimulating quality.* Sometimes it is necessary to repeat the venesection several times. Dr. Johnson advises bleeding till the head and præcordia are relieved, without regard to quantity, taken particularly in the height of the fit, and drawn into the centre and not against the sides of the basin which should be smooth, otherwise the inflammatory buff does not appear. C.

Dr. Lind speaks in the most favourable terms of the exhibition of opium in the hot stage of ague. He recommends the opiate to be administered about half an hour after its commencement, and he states, that it shortens and abates the fit, relieves the head-ach, which is always so urgent a symptom in this period of the disease, and brings on a profuse sweat with an agreeable softness of the skin, ending in a refreshing sleep. Dr. Lind is entitled to great confidence, for he was an accurate observer, and his opportunities of seeing the disease under all its modifications were very extensive.†

OF THE MODE OF PREVENTING THE PAROXYSM.

In the interval, I have already remarked, that the *indications* are more obscure. It is commonly stated, that the object is to give *tone* to the system; but the acknowledged efficacy of arsenic in the cure of agues does not countenance such an opinion. The precise effect produced upon the body by those drugs which are the most powerful in curing agues has not been ascertained. They appear to concur in producing some strong impression upon the nervous system, which prevents the developement of fever. This idea is corroborated by the consideration, that the nearer they can be given to the expected period of the paroxysm, the more certain is their effect. An emetic administered immediately before the accession of the cold stage is very serviceable.

℞. Ipec. ℈i.
Aq. Menth. Sativ. ʒx.
M. ft. haust.

A strong opiate, especially in combination with æther, as in the antispasmodic draught given below, has frequently succeeded in checking the paroxysm, on its first approach.

℞. Mistur. Camph. ʒx.
Tinct. Opii. gtt. xl.
Spir. æth. Sulphur. ʒi.
Syrup. rhæd. ʒi.
M. f. haust.

Sometimes an ounce of bark given immediately before the fit not only prevents it, but cures it altogether; the warm bath also is useful.

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* See Senac, p. 170–1. Cleghorn, p. 197–8., and R. Jackson on fevers of S. Carolina.

† Dr. Rush also gave opium with success, in the bilious fevers of 1780; the type must be moderate, and not inflammatory in order to its success.

The volatile alkali may be used with the same intention. Various remedies of a similar kind, consisting principally of combinations of spirit and aromatics, have acquired great reputation with the vulgar. They agree in producing some strong impression either upon the stomach or external senses.

Bergius gave six grs. of the capsicum with ℥ii of bay-berries in powder before the cold fit with effect: He also used garlic and mustard seeds at the same period: the objection, however, to all these stimulating plans is, that if they do not succeed they aggravate the fever. The plan of Dr. Fordyce, where this is anticipated, of giving 15 or 20 grs. of Dovers powder with carbonate of ammonia so as to excite a sweat before the cold fit begins is very effectual. To favour it, warm cloths, and about 40 minutes or an hour after diluents should be used: as, if any drink be taken immediately, it excites vomiting. Two drams of myrrh, taken before the fit, suspended it, in the practice of Dr. Heberden. Exercise on a hard trotting horse, walking rapidly or any kind of labour, the carbonate of ammonia, in the dose of 3 or 4 grs. also stop it.—The application for 15 minutes of tourniquets to a leg or arm, so as to compress the blood-vessels, prevent the fit, if used before it appears, or on its approach: a tourniquet applied during the cold fit hastens the access of fever. The patient should avoid going into cold air, washing his hands in cold water, or sitting in a breeze if the fit is expected. C.

MEANS USED DURING THE INTERMISSION.

The most generally successful, however, of all the means which have been resorted to for the cure of intermittent fever, is the exhibition of bark and arsenic.

An emetic of one gr. of tart. emetic, xx of ipecacuanha; or xxv grs. of the latter alone, followed by a purge of calomel and jalap, 10 and 10 of each; or of 25 grs. of rhubarb with 5 of calomel should precede the use of the bark; and if the system be feverish, the pulse quicker than usual, with a white tongue and dry skin, V. S. will have a good preparatory effect; In old persons an emetic given before the fit, where there is danger of death from the paroxysm, sometimes happily prevents it.

The species which are most relied on, are the cinchona oblongifolia or the red bark, lancifolia or pale bark, and lastly the cordifolia or yellow bark which is the most powerful. C.

Bark is most effectual when given during a state of perfect *apyrexia*, when exhibited in the form of powder, in large doses, and as near as possible to the expected paroxysm. One or two drachms may be taken every hour for six or eight hours previous to the fit. Much certainly depends on the *quantity* administered in a short space of time.*

Dr. Fordyce says, if taken during the hot stage, it increases the length of the paroxysm, and renders the termination of the disease less favourable.† The common effect of stricture across the breast, and difficulty of breathing, which the bark produces, shews clearly its stimulant power, when given during the apyrexia: During the fever, its effects must of course be more decided: Great weakness is the only case, which forms an exception to its exhibition during the fit. With regard to the quantity given during the apyrexia, its good effect certainly depends upon it: During the period, when the bark was considered as a dangerous

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* On this subject, experience is decided: It was the opinion of Dr. Cleghorn, that given during the fit, it destroyed life; owing, no doubt, to the highly excited state of the system, produced by the heats of Minorca.

† Philip, vol. i. p. 131.

medicine, it was customary to give it in minute doses. Sydenham gave it in small doses and at long intervals, a practice, which more recent experience proves to be injurious: Brocklesly speaks highly of it, in large doses, in obstructions of the liver and spleen, after a free use of emetics and cathartics: The latter medicines, by agitating these viscera, promote the return of blood from them, whilst the bark strengthens the system and gives power to the arteries, and thus the venous stagnation, on which these obstructions depend, is obviated. In the opinion of Lind, when given in large doses, it prevented the dropsy, jaundice, or violent headach, which were proportional to the number of fits which preceded; without the bark given largely, these consequences certainly followed: Dysentery, dropsy and obstructions of the viscera were always most common, in the observation of Dr. Jackson, when the bark was sparingly employed. Storck found it the best remedy for the latter affections, occuring after ague. If the apyrexia is short, the doses should be large and frequently repeated; if the intervals, however, are longer, the doses may be smaller, and more protracted: In England, two ounces in the opinion of Dr. Millar, after the experience of a long life, were sufficient to prevent any mortal consequences; the same remark is confirmed by others. C.

All means therefore should be taken to prevent its disagreeing with the stomach, or running off by the bowels. For this purpose it may sometimes be advantageously united with an aromatic, or with opium, or a few grains of rhubarb; or the form of decoction and extract may be substituted for the powder.

℞. Decoct. cinchon. ℥ss. extract. cinchon. gr. xv. tinct. cinchon. ʒi. M. ft. haust.

To children, it may be administered with laudanum in the form of clyster premising a purgative: the sulphate of quinine, also may be given between two wafers, made by dropping a fluid paste of flour and water on a hot smoothing iron, and then compressing it with another, heated in the same way, as recommended by Dr. Cartwright. This medicine relieves agues in the dose of a quarter of a grain in adults, and in this mode will be found very agreeable and effectual; or bark may be applied externally quilted in a waiscoat, or in poultices to the legs and arms: Two or three grains of the sulphate of quinine every two hours is the common dose for an adult: Ten drachms to a pint of sherry wine, make a good tincture; it may be given in the dose of a wineglass full thrice a day: as astringents are sometimes given in ague, it should be recollected that they precipitate the quinine and therefore are improper vehicles for it: Cream of tartar decomposes it. It may be given in sulphuric acid in the proportion of a minim to every grain of the salt: Dr. Hosack recommends the combination of the bark and citric acid as most valuable next to the sulphate. With regard to the bark, it is best given in milk, washing the mouth with it afterwards, or with liquorice; to soldiers and sailors, brandy and water or porter, is the most agreeable vehicle.

Its infusion and decoction should be prepared in vessels with narrow mouths, kept from the air and used soon, as Fourcroy tells us its active matter is precipitated by combining with oxygen, and will often be found to be capable of being exhibited with laudanum or wine, when the powder cannot be borne. The powder, after the sulphate of quinine, is the most effectual: Barry's extract, which is prepared by evaporating the decoction in vacuo is the next valuable. Sometimes the tincture from its alcohol is more valuable than any other form: Its efficacy is increased also, as the author states, by various additions.

I. In simple ague without local affections; Cascarilla, serpentaria, carbonate of ammonia, camphor, mustard, the alkalies, cloves, cinnamon, opium, are recommended: These tonics and stimulants are particularly useful when age, debility, a damp situation, a rainy season give the disease a more obstinate character, or when the stomach is weak. The serpentaria, with the salt of tartar particularly has been useful: the following prescription is recommended on the authority of Dr. Lind. ℞. Cinchon. pulv. ℈ii. sal. tartar. et. serpentar. Virgin. a gr. xii. M. detur quaque hora. Seven or eight doses effectually prevent the fit; and given for seven or eight days, no relapse occurs.* The following formula is also valuable; ℞. Cin-

* Lind on the Diseases of Hot Climates, p. 77. Phil. 1811.

chon. pulv. et potass. supertartrat a ℥i. caryophyll. contritor. No. xxx. M. Dose—ʒiss every third hour.

The Virginia snake root and myrrh may also be combined with the bark; equal parts of bark and the former, with ℈i of the latter every two hours: Lind speaks highly of fifteen grs. of alum, ten of nutmeg, and ten of extract of bark given twice a day. Five grs. of camphor with a drachm of the bark, or three grs. of carbonate of ammonia with the same quantity, or a gr. of opium may be given when the system requires support, the habit is phlegmatic, and in quartans: The tincture is then particularly useful: also in the form of julep with ℥ brandy: and if spirits be not agreeable, the vol. spirits of ammonia and ten drops or a dram of the tincture of myrrh may be given with each dose: mustard is combined with the bark in the quantity of ten or twenty grs. with good effect: In simple agues the above medicines arrest it, and prevent the violent headachs, vertigo, jaundice, swellings of the liver and spleen, so often the result of its return. When there is great debility in the intervals, a cordial diet, with wine and steel are useful. The efficacy of the bark is also increased by other medicines.*

II. When hepatic disease is combined with it; calomel in doses of a gr. every night and morning so as to affect the mouth and keep the bowels open, is a valuable assistant: The muriate of ammonia, combined with the bark is also highly praised; Purges of sulphate of potash with senna, rhubarb also are useful, in this case.†

III. The combination of other medicines and plans increase its efficacy, when the stomach is out of order. A sense of heaviness, tightness of the chest, and sickness at the stomach indicate this state:‡ An emetic, and a purgative, and then the bark, given in the form of enema, succeeds well: or salt of tartar grs. xv. with 8 or 10 drops of laudanum, in a table spoonful of vinegar, every two hours; or salt of tartar and lemon juice.§ The combination of aromatics, in this case, is also valuable, after the use of emetics and purgatives. When the bark produces simply sickness at the stomach, the elixir vitriol, or a dose of laudanum alone, or united with camphor often relieves it.

IV. When it produces excessive purging, eight or ten drops of laudanum, with ʒi. of chalk, with 10 grs. of alum, extract of logwood, kino, or catechu, may be given in union with the sulphate of quinine, or with the infusion, decoction or powder of the bark: after excessive purging, by the bark, the next fit is often more severe; the disease then becomes milder and often disappears. This is true in some instances; it has, however, been observed, that notwithstanding the purgative or emetic operation of the bark, the next fit has been milder, and the febrifuge properties of that medicine entirely uninjured.

V. When cough is combined with ague, blisters to the breast, venesection, linseed tea, decoction of mallows, mucilage of gum Arabic, syrups; with nitre and other sudorifics. Groaning; anxious respiration, producing sudden waking, particularly in a recumbent posture; cough; pressure on the intercostal muscles giving pain, are signs, which will enable the physician to judge of the presence of this local affection: he should, more particularly, attend to the state of the thoracic organs during the fit; as, if the fever runs high, the face is red, with great external heat, thirst and strong pulse, by the patients account, he will, when during the fever every function is strained to the utmost, be able to find out the weak part, which bears worst the onset of reaction; this remark applies to all other cases of local affection.‖

VI. Costiveness; or brown, black, or bilious stools indicate the combination of purgatives, emetics, and diluents.¶

When the symptoms are violent, the bark will be more efficacious by other combinations.

It must, then, be given at shorter intervals; and commenced as early as possible; if the bowels are costive, purgatives of calomel and jalap, or rhubarb, senna and manna; if the mouth and skin be dry, with febrile symptoms, in the intervals the combination of 10 or 15 grs. of nitre: or of salt of tartar ℈i. and lemon juice or vinegar ℥ss. or the spiritus mindereri ℥ss., with each dose, will be salutary.

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* Med. Recorder, p. 530. vol. viii.
† Ibid.
‡ Senac.
§ Ibid.
‖ Philip.
¶ Senac.

VIII. When the symptoms are malignant, attended with either coma, stertor, syncope, stupor, convulsions, great debility, facies hippocratica, or intermitting pulse, &c., and threaten from their violence sudden death, at the next attack; the bark is to be administered in great quantities, and frequently repeated, beginning as soon as the fever abates: 8 or 10 grs. of the sulphate of quinine, every two or three hours, in desperate cases, may be attempted: In the mean time, the bowels should be kept freely open, by purgatives of calomel and jalap, particularly where there is pain in the head or breast; bleeding is necessary, especially in the apoplectic, comatose, and rheumatic forms, if the pulse be full and frequent: it must, however, be used cautiously and in small quantities from its effect in reducing the system and favouring the aguish disposition. Diarrhœa, where it is excessive, should be restrained from the danger of debility: The means, also recommended, to alleviate other dangerous local symptoms, should, also, be practised according to circumstances.*

IX. When the case has been neglected, or the patient injured by vomits, by excessive exercise used to prevent the fit; where the paroxysms are protracted, violent, and run into each other, or are attended with coma; these symptoms are perplexing, and are to be palliated by purging with Epsom salts, combined with the bark; an oz. of the former to ℥ss. of the latter, divided into four portions, and one to be taken every two hours: The fit becomes milder, an intermission succeeds, and the bark alone, then, will complete the cure: If syncope and dissolving sweats be present, or excessive weakness, and the patient cannot bear purges; cordials, of which wine is the best, may be given, with six or eight drams of the bark in 10 or 12 hours: In these cases, large doses must be prescribed, otherwise, the next fit may be fatal:† Torti advises an oz. to be given at a dose; ten or twelve grs. of the sulphate of quinine may be taken every two or three hours.

X. When the pulse is small and hard, or obscure, without expansion, or where a vermicular motion is observed, in the state of the artery, with a constricted skin, or a clammy moisture, on the surface, it has been found useful, to premise blisters to the back of the head and neck; the bark, without them, does no good.‡ C.

But there are certain states of the constitution, which are found to interfere with the exhibition of bark in any form, and to counteract any good effects from it. The principal of these are, inflammatory diathesis prevailing in the system, disorders in the primæ viæ, obstructions of the liver and spleen, and the presence of other diseases. Hence arises the necessity of giving purgatives, or saline or antimonial medicines, or alteratives, particularly mercurials, either previous to, or combined with bark, according to the circumstances of the case.

To be more particular, I. An inflammatory diathesis is evinced by a small hard and frequent pulse, flushed face, difficulty of breathing, pains in any part of the body, general fever, sizy blood, pain increased on pressure of certain parts, dry skin, yellow tongue: purges and venesection then succeed completely: The early use of the bark in these cases, produces stricture of the chest, an increase of fever, black stools; and if continued, cachexy, suppuration of the liver, dropsy, and even melancholy, are its consequences:§ also stupor, diarrhœa, continued fever, dysentery, spasms and death.

The debilitating effects of heat, old age, and previous evacuations, often will determine the propriety of not drawing blood, though the pulse and other symptoms indicate it: the character of the prevailing epidemic will also afford some insight into its propriety; if bleeding is well borne in other diseases, it will also be in this.

II. In a deranged state of the liver, evinced by a pale or yellowish cast of countenance, hard and tumid belly; the neutral salts continued daily for some time are

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* Alibert. † Cleghorn, p. 210-11.
‡ A treatise on the Fever of Jamaica, p. 210. Phil. 1795. § Senac.

useful; and if the cachectic disposition is of longer continuance, calomel, jalap, rhubarb, gamboge or scammony to purge daily, will be necessary: A slight salivation may be tried; if that is not successful, a gr. of the extract of cicuta has a good effect. Pringle found antimonial emetics useful in this form. When the belly becomes soft the bark may be administered.*

III. Dropsy. Purgatives are then to be relied on: However, as Sydenham remarks, the intermittent must be cured, before they can be administered, as the debility produced by the purgatives confirms the ague, without relieving the dropsy. The bark, therefore, must be given, combined with light diuretics, according to the case: nitre, in the dose of a scruple, given in an infusion of juniper berries, or horseradish, will assist the cure: frictions upwards, and in the morning only, if the legs only are swelled, will be proper.

Purging succeeded with Pringle, only when united with the salt of tartar; the bowels were opened by half a dram of the pillul. ex colocynthid. cum aloe, given once in four or five days; forty grains of salt of tartar were dissolved in about ten ounces of wormwood tea, to which were added about two ounces of Holland gin; and the mixture was taken at three draughts, and repeated daily; in the decline of the disease, some common chalybeate was given: garlic, or mustard seed, taken internally, promoted the effect: horse-radish, also black-pepper, are sometimes useful. The bark should be given after the water is removed to complete the cure: antimonial vomits Pringle also found to succeed, in removing the dropsy: the following prescription he also recommends highly. ℞. Flor. Chamom. ℥ss. aq. pur. bull. ℥viii. macera per dimidium horæ et colatur. admisce spirit. vin. gall. ℥ii. salis absinthii ʒi. Dose—℥ii. three or four times a day.

Exercise, as violent as the patient can properly bear; frictions; warm clothing, and cantharides, as a diuretic, with peruvian bark, are also valuable.†

IV. If there be pain in the head during the intermission, local bleeding often relieves it and prepares for the bark. Cleghorn recommends in this case, the pediluvium, and a cataplasm of horseradish to the soles of the feet. When this pain proceeds from the stomach, emetics will relieve it.

V. Excessive sweats. Venesection often relieves this symptom, when the patient is still strong: If the signs of obstructed liver be present, purges succeed.‡ If they proceed, however, from excessive debility; tonics, and gentle laxatives with exercise are proper.

VI. Tympanites. Pringle tells us, that sometimes the belly swells suddenly, after the improper use of the bark, or of opium in dysentery, from the distension of the colon, by air. He advises, if there be fever, to bleed; also to purge with rhubarb, and give the following saline mixture: ℞. Sal. absinth. ʒi. elix. vitriol. acid. ʒii. vel quod satis sit saturand; aq. puræ ℥vi. aq. cinnamom. simpl. ℥i. syrup. e corticib. aurant. ℥ss. m. Dose ℥ii. five or six times a day: If there be no fever, the rhubarb with the aromatic electuary, drinking at the same chamomile tea; every night at bed time, 15 grains of rhubarb were given till the tumour disappeared, adding also steel, ginger, and chamomile flowers, if the bowels appeared to be debilitated: all strong purgatives, without laxatives, he found to be hurtful.§

VII. Sometimes the paroxysm does not complete its course; thus, we have fever without sweat; then the bark does no good, when given in the interval alone, but, if during the fever, the patient drink largely of warm tea, and frictions of the skin be used, towards its conclusion, with warm flannels, the sweat breaks out, and he is relieved: If the chill is excessively violent, and is followed by no fever, then opiates ought to be given with the bark in the intervals.

VIII. Sydenham tells us, that hectic often succeeds intermittents in children; and is distinguished by a swelled and hard belly, a cough, and other consumptive symptoms, with some complication of the rickets: Purgatives on every other, or on every third day, producing at each time five or six motions a day, should be continued for nine days; (we suppose till the morbid matters are thoroughly evacuated.) In continuing the purgative, after the first thorough cleansing as

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* Senac.

† A Treatise on the Fever of Jamaica. p. 219. Phil. 1795.

‡ Med. Recorder, vol. vi. p. 538.

§ Rush's Pringle, p. 191. 1810.

above advised, it is necessary to recollect, that violent purging debilitates and keeps up the ague; it is, therefore, proper to administer the purgative once a week, for two or three months, and give a quieting draught, in the evening, after the operation, to prevent the return of the fit; which sometimes happens from the mildest disturbance the cathartics may produce:* Sydenham remarks with regard to intermittents in children, that the fit hardly ever ceases in them, till the belly, near the spleen, begins to swell and grow hard: this swelling with that of the legs, is an almost certain sign of the disappearance of the disease in children.

IX. Sydenham also mentions a pain and inflammation of the tonsils, after continued or intermittent fevers, attended at first by difficulty of deglutition, succeeded by hoarseness, hollow eyes, and hippocratic face, portending imminent death; they are produced by profuse evacuations in patients worn out by the violence and long continuance of the disease.

X. The same author also mentions madness as a symptom, which follows long continued ague: evacuations long protracted change it into confirmed idiocy: It is cured only by a slender but restorative diet, by stimulants; confinement to the chamber and lying much in bed; when the disease abates in the course of a few weeks, the stimulants are to be omitted for a few days, continuing the diet as before directed; again repeating the cordials in a few days, and persisting in them, for a short interval, till the recovery of the patient; this plan cures madness in cold and weak constitutions, when an ague has not preceded.†

XI. Sometimes diabetes follows the ague in aged people, when the disease has been of long standing, the patient much debilitated by bleeding and purging; to increase the strength is the plan here; for this purpose, tonics, as the bark, wine and animal food, with a most rigid abstinence from vegetables are proper.

XII. Sometimes the disease is still incurable by any of the ordinary remedies; Senac succeeded in these cases, by keeping the patient for three or four days on water alone: Warm water, of which he gave six or eight pounds a day, was preferred: This plan has succeeded in Lancaster county in this state, in cases, incurable by other means: The visceral indurations, the brown tongue, and sallow skin, soon disappeared; at the end of four days they were allowed barley water for their diet, and as much burdock tea as they could drink; then by the use of gentle tonics they completely recovered. An excited pulse after taking exercise, though moderate; the appearance of the same symptom on certain changes of the weather or irregularities of diet indicate the above plan: A course of gentle purging by mineral waters with a moderate diet of chicken, beef and mutton, the farinacea and change of air succeed, after all plans have been used in vain. When they all fail, Senac advises the patient to be left to nature, keeping the bowels moderately open, and using as above digestible food.

XIII. When the disease proceeds from a rheumatic, venereal, gouty, or scorbutic diathesis, which often assume the intermittent form, then each of these are to be treated by their appropriate remedies:‡ If there be a local weakness; as pain from a carious tooth, it will often assume the intermittent form, and the bark will in many instances cure it; yet if the affection be considerable, the removal of it will be necessary, as the irritation of the inflamed nerve debilitates the general system, as the intermittent also increases the local disease: and so of other irritations. C.

SUBSTITUTES FOR THE BARK.

Various substitutes for the cinchona bark, native and foreign, have been introduced into the Materia Medica. They all belong to the class of bitters and astringents; and though attempts have been made to establish chemical differences between them and the cinchona, yet these have thrown no light on the cause of the acknowledged superiority of the latter. Among the best substitutes for the cinchona bark may be reckoned those of the cusparia, of

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* Sydenham, Rush's Ed. page 45, 6, 7.

† Ibid. p. 49, 50.

‡ Storck, Ann. Med. p. 174.

different species of salix and quassia, and the roots of the acorus calamus, bistort, and rhatany.

The species of willow, which has been found particularly useful is the Salix latifolia or caprea, (broad leafed willow bark.) It is given in the dose of an oz. and a half of the dried or pounded bark to a pint and a half of boiling water. The dose is half a gill five or six times a day.

Some of our native willows are recommended, particularly the alba, pentandra, and latifolia above mentioned. The barks of some of our oaks are also mentioned favourably—of the prunus Virginiana, the sassafras (Laurus sassafras) the persimmon (Diospyrus Virginiana) the dogwood, (Cornus Florida, and Sericea,) from which Mr. Carpenter has procured a salt, the sulphate of cornine, which has been used with success by Dr. Morton of this city; the dose of the cornine is three or four grains every two hours.

The Magnolia grandiflora, the liriodendron tulipifera, populus tremula have also been used in this country for the cure of intermittents: The aristolochia sipho, and a. serpentaria, are also recommended, as valuable tonics. They may be used in the dose and form above prescribed, for preparing the salix latifolia. The Eupatorium perfoliatum is recommended by Dr. Hosack and Anderson as valuable.

The calamus has been found valuable united with equal parts of bistort, a little ginger,* and given in the same dose as above.

The rhatany is recommended in the dose of twenty grains of the powder, or in the form of extract or decoction.† It does not, however, answer the expectations of its best friends. Charcoal has also been recommended in the dose of a scruple or half a dram three or four times a day; It often succeeds, but, without purgatives, it produces dangerous concretions in the bowels.‡ Cobweb, in the dose of two or three grains thrice a day succeeds also.

The cinchona carribea, the St. Lucia, and Tellicheri bark are also highly spoken of. The quassia is given in the quantity of (ʒii. to ℥x. of water.) ℥ii. every two hours during the intermission: The gentian, cascarilla, or serpentaria may be taken in the same way: The faba Sti. Ignatii. one and a half gr. infused in ʒii. of water, and given morning and night, Lind tells us, has succeeded. It is, however, uncertain. The oxide of zinc in the dose of two grs. four times a day has also been used with success: The sulphate of copper in one-fourth to half a grain, at the same interval; and the cuprum ammoniatum, in the same dose, have also in some cases done good. The rubigo ferri, the sulphate and steel filings are also given with success in cases of old standing: all these medicines may be combined with the Peruvian bark,§ and thus increase its efficacy. The cold bath also succeeds completely in arresting the ague if taken twice a day during the intervals. C.

Of the mineral substances employed in the cure of agues, the most powerful is undoubtedly arsenic, the efficacy of which has been ascertained by the most ample experience. It is best given in the form of the liquor arsenicalis, and in the dose of five drops, gradually augmented. After a certain length of time, sometimes, indeed, from the very first, it will produce nausea and vomiting, when its exhibition must be suspended, and a few grains of rhubarb given. Under proper management, arsenic will be found, next to bark, the most generally useful of all the medicines which have been recommended in the treatment of agues; but its administration requires the same cautions as that of bark.

It produces, also, dropsical swellings, palsy of the extremities, and even death. It should, therefore, never be continued longer than two weeks at a time, and its dose should be diminished or suspended, when the system is highly sensible to its action. It may be united with the bark taken in infusion, decoction or powder.

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* Thomas' Practice, p. 14.
† Ibid.
‡ Medical Recorder, p. 339, for 1825.
§ Thomas' Practice, p. 17.

Though the author mentions, that it is subject to the same rules in administering it as the bark; yet, in moderate inflammatory cases and during the fit, it may be given when the bark cannot, and without regard to cough, pain, or other local affections.

The best mineral substitute for it is the sulphate of zinc, which is largely employed in the fenny counties of England. It is given in doses of one or two grains, three times a day, and in conjunction with a small proportion of opium, has proved eminently serviceable.

The prussiate of iron, as recommended by Dr. Zollickoffer in the dose of ten grains, thrice a day, has been praised by Dr. Hosack; with others it has failed.

Change of air, from land to sea, or to mountainous and dry situations, with the bark every morning and evening, are also most effectual plans. If the attack should come on, then it will be necessary to be more moderate in the use of the necessary evacuations, which are to be directed according to the rules above laid down, according as there is general fever, affections of the liver, stomach or bowels.

OF THE COLLATERAL MEANS TO BE USED DURING THE INTERVAL.

I. With regard to the diet. It should be of such a kind as to give strength in the highest degree, and in the easiest manner. Or, in other words, it should be the most nourishing, least irritating, and most digestible: The farinacea; as rice, sago, panada, barley, boiled with raisins or figs; also apricots, peaches, prunes, apples, will form a good diet, during the remissions, taking them at a time sufficiently remote to complete the digestion, before the fit comes on, so as to gain the greatest strength.* These kinds of food will be most proper, where the paroxysm has been inflammatory; in cases where the patient is much debilitated, and a more tonic plan is required, mutton, beef, and fowls will be the most proper: the articles first mentioned, rice, &c. should be boiled. Broiling is the best mode of preparing animal food; and if any drink is thought proper, from the debility of the patient, or from his previous habits, beer, porter, or port wine, with water, will be found to be best: lamb and veal are more indigestible than beef and mutton: wild fowl is proper; fish not so, from their difficulty of solution, more particularly those which become adhesive on boiling; or others which are too firm: oily and acescent substances are most difficult of digestion; the flesh of old animals more easy than that of young; vegetable substances more difficult than animal; which, however, are more irritating: It is, therefore, necessary to look to the state of the fever, and to the powers of the stomach in prescribing for it; selecting those articles, which furnish the greatest strength, and expend the least in assimilating them:

If the stomach be weak, animal food, biscuit, or stale bread will be most proper; fresh vegetables, smoked and baked meats, pastry, cucumbers, melons, soup, gravies, butter, should be avoided; the drink should be taken of a moderate temperature; as dyspepsia has been produced by taking it excessively cold:†

If the patient has been accustomed to live generously, low diet will increase the tendency to a return of the fits:

The use of proper food is essential, because acidity, and disagreeable sickness, indigestion, want of appetite, imperfect remissions, pain in the forehead, furred tongue are the results of the accumulations, which take place from imprudence in this respect, in the stomach and intestines, and which can only be removed by strong emetics or purges.‡

II. *Air and exercise.* Every means of increasing the strength should be had recourse to, when the patient is entirely clear of fever: pure country air, in an elevated situation, remote from any miasmatic, or other source of impurity, should be sought: gentle exercise at first; as walking, also friction with the flesh brush, and, when the intermissions become more perfect, exercise on horseback will be advisable: any violent exercise will be improper, till the fits are completely

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* See Fordyce.

† See Philip, vol. i. p. 123.

‡ Fordyce, p. 47. 1794.

checked: and as the patient convalesces, the adoption of the more violent kinds should be gradual; as walking and sailing; riding gently in a carriage, then the use of dumb bells, a trotting horse, &c., as he becomes stronger, will gradually confirm the cure.*

The exercise of the mind, also, in those modes which are most congenial to it; as in business, taking care not to fatigue it: amusing reading and society, when there is no fever or irritation in the interval, will be proper.

Retire early,† at the same time take care not to lie long in bed; I have seen a lady so nervous from great indulgence in this respect, that if she laid in bed beyond a certain hour, her debility became so great that fainting on any slight exertion was the result. The early period of the disease, the strength of the patient, whether debilitated by previous sickness; his age; his former habits with regard to exercise, must regulate its degree: It must, however, be recollected, that even to the latest period of life, the inflammatory diathesis sometimes prevails; a spare diet and blood-letting is, therefore, often proper, even in the case of persons far advanced in life; the spring always renders the habit more inflammatory, and therefore requires depletion; whereas, in the autumn, stimulation becomes necessary, from the abstraction of the heat of the summer, which leaves the body in a less irritable state.‡

In order to prevent a return of the ague, it is necessary to continue the bark for some time, two weeks or more, then substituting for five or six days some other tonic, and afterwards again to resume it; rain, cold, night and morning air, marshy situations; the hot sun, and all excesses in diet, or any thing which may debilitate, must be avoided.

Remittent fever arises, as I have stated, like the intermittent, from marsh exhalations. It is a type of fever very frequent in hot climates, where it occasionally occurs under a highly aggravated form. Its symptoms vary with the nature of the climate, season, the constitution of the patient, and many *local* circumstances, so that it is difficult to give any precise detail of them. They bear a general resemblance to those of intermittent fever; but other symptoms, such as we formerly mentioned as occasionally occurring in the course of continued fever, are met with also in the remittent, and materially affect the character of the disease, the prognosis, and the method of cure. Of these, the most important are those which indicate severe *gastric* derangement; and this combination of remitting fever from paludal exhalation, with disturbance in the functions of the upper abdominal viscera, the consequences of atmospheric heat, constitutes that formidable disease known by the name of *the bilious remittent of hot climates.*

The treatment of this, and of all the other varieties of remittent fever, is to be regulated, partly by those principles which have been laid down as applicable to intermittents, and partly also by a consideration of those which guide us in continued fever.

MODE OF PREVENTION OF THESE DISEASES.

With regard to the prevention of intermittent and remittent fevers, experience recommends the following plans; the bark, nourishing and stimulating drinks, as

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* See Philip and Fordyce. † Philip.
‡ Philip, p. 127, 8.

mutton, beef, and fowls, with porter, wine, &c.; avoiding drinking punch, lemonade, spirits, or simple water in great quantities, as they debilitate. Chamomile, quassia, or gentian tea, are good drinks.

Avoid the morning, evening, and night air, the hot sun, great abstinence, intemperance in eating and drinking, improper food; as acids, rich sauces, pies, high seasoning in excess; at the same time, if the stomach has been accustomed to it, it is necessary not to abstain entirely from these articles, as the strength must be at all times kept to its highest degree: choose the upper story for a residence; shut up the windows of the side of the house, fronting the marsh from which the exhalations come.

Do not visit an infected district, after living for some time in a pure air.

If the marsh is small, drain it, fill it up, or scatter lime over its surface; the inundation of a marsh has completely arrested the intermitting fevers produced by it. The removal, burial, or destruction, by fire or water, of all putrid matters, have done so likewise. Marshes are rendered healthy by timber growing upon them, thus preventing the action of the sun; trees condense, it is probable, the miasmata upon their leaves, the temperature of which is always lower than that of the surrounding air, in the excessive heats of summer, when miasmata are produced in the greatest quantities: In this way, trees near houses protect the inhabitants from their effects, and a wood between a marsh and an encampment is said to prevent the ague in soldiers.

Ventilation, thorough cleansing of houses, warehouses, ships, hospitals, and all places where there may be filth, are necessary: the streets of a city should be kept perfectly dry, by causing the water to run off by sewers below them, and burning or carrying away all vegetable matter, and other refuse of kitchens.

CHAPTER VIII.

OF THE YELLOW FEVER.

Controversy on this subject—Varieties of Fever in the West Indies—Symptoms of the Epidemic Yellow Fever—Its Analogy to Typhus—Treatment of the Disease—Notice of the principal controverted Points in the History of the Yellow Fever—Question of foreign Origin—Of Propagation by Contagion—Of Exemption from a second Attack.

Although we presume, that in the observations which have been already made, we have explained the most important of those general principles which are involved in the pathology of fever, and though the discussion might therefore be expected to terminate here, still it may be found advisable to pay some particular attention to the subject of *yellow fever.* It is one which has excited a great deal of interest in this and other countries, during the last thirty years. It has given rise to the most remarkable differences of opinion among persons who are, to all appearance, equally qualified to form a correct judgment regarding it; nor is the controversy yet brought to a conclusion. Little doubt can remain, that these singular differences of opinion have arisen from the want of correct views of the pathology of fever; and it surely cannot be a useless task to attempt to elucidate a subject, confessedly so obscure, by applying the doctrines which have been already laid down, to an explanation of the principal points in dispute.*

The yellow fever is a term which has been applied to express a particular form of febrile disease, which has been observed to prevail in the West Indies, along the shores of North America, particularly at New York and Philadelphia, and more lately in the southern parts of Spain. It has received various names. By some it has been called the *Maladie de Siam;* by others the *Bulam Fever.* Though justly accounted among the endemics of hot

* This task has been rendered comparatively easy by the recent labours of Sir Gilbert Blane, who, in his Treatise entitled "Elements of Medical Logick," has given a very luminous view of the yellow fever question which almost precludes the possibility of future ambiguity.

countries, it has yet principally excited attention from having prevailed *epidemically* in those regions, and been productive of very great mortality in particular seasons. The endemic fevers of the West Indies, like those of other countries, are either such as arise from marsh effluvia, or from what we have called *common causes*, cold, alternations of atmospheric temperature, or insolation;—that is to say, they are either intermittent, remittent, or continued. In almost all the controversial writings on the yellow fever, these different *forms* of febrile disease have been confounded together; and it has accordingly been, from want of precision in the naming and classing these fevers, that several of the disputed points have originally sprung. But there is a second general cause to which the controversy may be referred, whose influence is even yet more extensive than that of error in the classification of fevers;—I mean, a want of correct knowledge of the general laws of *contagion*. The consequence of this has been, that the analogies and distinctions of epidemic and endemic diseases have been overlooked or misrepresented. It is hopeless to attempt to reconcile the discordant opinions of authors on the yellow fever, if these fundamental doctrines are still made matters of dispute.

As the author has probably never seen the disease, and has drawn his opinions and reasoning from high authorities, we can only notice some of the leading items he has copied. We propose to examine some of the most prominent features of doctrines by the test of experience and fact rather than yield them through the medium of speculation. We admit that Sir Gilbert Blane is the ablest advocate of the doctrine of contagion who has publicly appeared; but after the most scrutinizing examination of his reasoning we are obliged to conclude, that his arguments are inconclusive. To this broad assertion we may (however presumptuous it may appear to some) state that we have elsewhere refuted his reasoning by anticipation. The remark of the author, that there exists "*a remarkable difference of opinion among those equally qualified to judge;*" is very far from being the result of a general understanding among professional men. Of those whose clinical observations have been the basis of their creed, not one in forty inclines to the doctrine of contagion in our country, and as to our opinion of such as have not seen the disease, it merits no more respect, than that of the naturalist who should undertake to describe the productions of a region he never saw. We agree with the author moreover that "*a want of correct views of pathology,*" is one of the sources of difference of opinion as well as of much error, and on this admission will endeavour to show the fallacy of the opinions adopted by the opposition. The appellations bestowed on the disease, are sufficiently expressive of the defective state of its pathology. The epithet *yellow* is only incidental. It is to be observed only in the worst cases, or in those that have been neglected or improperly treated. If the proper system of depletion be opportunely and sufficiently applied, this appearance is not to be seen. *Synochus Icteroides* is a name still more unfortunate, because it presumes to fix the degree of fever, a power which no nosological title can confer. It may measure the type and detail the symptoms, but cannot tell the quantity of disease: the fever consists of all degrees (according to the condition of the nerves of the subject) from the most ferocious synocha to typhus gravior, and are successfully treated by the remedies for those states, though generally by evacuations. All the names given to the disease are founded on some uncertain and precarious accident. The existence of the disease at *Siam* or *Bulam* only proves it the product of warm climates, but does not prove it *contagious*. It has been called *La fievre matelotte*, because it has so often appeared on ship board, but this does not establish that it is contagious. Almost every symptom of the fever has given it a name according to the fancy of some one who has seen it. It has been called by the Spaniards *vomito Prieto*, the black vomit, although it is only

an accidental concomitant. It is clear it cannot be pathognomonic because free and early evacuations generally obviate such a termination; and for another reason, because many die of yellow fever without this symptom, with and without medical treatment. The affection of the brain kills some, the condition of the liver some, and the inflammation of the duodenum and consequent sphacelus others.

The doctrine of *contagion* of plague, typhus and yellow fever appear to arise from prejudice. It is strange that the most illiterate men in the West India islands, where yellow fever has prevailed since they were visited by Europeans, will laugh at such an opinion, while philosophers are devising all the means that sophistry can invent to prove what the universal experience of mankind contradicts. Hundreds of persons ill of yellow fever are received into our hospitals during the existence of all our epidemics, and there has been no interruption of the intercourse between them and their friends, who have invariably visited them with impunity. Neither nurses or visitors have contracted the disease. P.

The yellow fever is not reproduced like the small pox and measles by a matter generated by the sick; Because inoculation with the saliva, with the serum of the blood, and the black matter from the stomach does not produce it; this fever in hospitals in the country, where physicians and others breathe the air, touch and even handle the sick, is not communicated; mothers ill with the disease sleeping with their children, also parents, and friends under the same circumstances do not in a country air communicate it: If, however, the disease be protracted, till it assumes the typhous form, the excretions and perspiration will reproduce that form, as in all other cases of fever; the disease will, then, be typhus and not the yellow fever; as the yellow fever ends rapidly, either in death or recovery, typhous symptoms hardly ever appear; on this account, the disease seldom becomes infectious.

Heat, moisture and putrefaction from any cause may produce the yellow fever; on this account, the clothes and excretions of the sick, in close and unventilated places sometimes, though very rarely reproduce it: the excretions of the well under the same circumstances would have had the same effect, as there is no peculiar contagious matter generated in this fever: From the shortness of its duration, typhous symptoms more seldom appear in it than in common remittent fever; it should, therefore, be considered as less likely to be contagious than almost any other form of fever. Putrefaction is the cause of yellow fever: 1. Because this fever increases and declines with the summer, the season which produces putrefaction. 2. The same causes; as, frost; intense dry heat; high winds from the north; lasting, heavy inundating rains; the destruction of putrefying materials by fire, or water, which arrest putrefaction, also arrest the yellow fever: The reader will find both sides of this subject fully and ably discussed in the essays of Dr. Hosack, and Dr. Rush.

Most of the genuine febrile diseases of hot climates appear to have a *bilious* tendency. Both the inflammatory and the intermittent and remittent endemics of those countries, are frequently accompanied with a yellow colour of the skin, and other symptoms supposed to denote that the functions of the liver are materially disturbed. Into the symptoms and treatment of these forms of disease, however, it is not my intention now to enter. They are noticed only, in order to compare them with the genuine yellow fever, such as that which raged in the West India Islands and at Philadelphia in 1793; at Cadiz in 1800; at Malaga in 1803; at Gibraltar in 1804 and 1813, and at Ascension Island in 1823. As this particular form of fever has been observed in all these situations to exhibit very much of the same defined character, and as it presents some peculiarities which may distinguish it from other epidemic fevers, I shall give a short account of its symptoms and progress, of the appearances found on dissection, and of the most approved system of treatment. It must be remembered that the

same *kind* of fever is occasionally met with as an endemic of the West Indies; but to avoid ambiguity, I shall here direct my attention exclusively to the *epidemic* disease; the characters of which are strongly marked.

The attack of yellow fever is ushered in, in the usual way, by languor and rigors. There is sometimes a peculiar dejection of countenance observed, with a remarkable aversion to the least motion; at other times there is an appearance of inebriation. The face is flushed, but the most prominent of the early symptoms of the disease is headach, of a very peculiar kind. It is exceedingly severe, and referred to the forehead and bottom of the orbits. The eyes appear dull, glassy, suffused, and protruded. The tongue is at first furred and moist, and trembling, but by degrees it becomes dry and black, or sometimes of a fiery red colour. The heat of skin is but little increased. The patient sometimes lies in an almost insensible state, but extreme restlessness has also been noticed.

To this succeeds the second striking feature in the symptoms of the disease, great irritability of the stomach. The matter rejected is very seldom bilious, or if so at first, it speedily loses that character. For the most part it is slimy and tasteless, and adheres in small flakes to the sides of the containing vessel. As the disease advances, it assumes a dark colour, and comes to have the appearance of coffee-grounds. This is the *black vomit*, which may be considered the characteristic feature of this disease, as much as buboes and carbuncles are of the plague. The dejections have a tarry appearance. There is often noticed a suppression of urine, which like the black vomit, is a fatal symptom.* Hiccup, hæmorrhagies,

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* The following is a description of its most violent form.

The attack of this disease is generally sudden and without chill; there is violent pain in the head, back, and limbs; there is great prostration; almost immediately succeeded by vomiting, red eye, suffused and tumid face; the parts about the fauces and throat are so likewise; the patient speaks thick, as if his tongue was too big for his mouth, very much like an intoxicated man; the skin is arid; the heat burning, pain in the head, acute, and fixed above the orbit of each eye, with a sense of weight in the whole head and difficulty of speaking: There is a fixed burning heat at the pit of the stomach, with anxiety and restlessness, continual and distressing vomiting, and loss of appetite: Large drops of sweat hang on the face; the tongue is generally moist and morbidly clean, more red than in health with a peculiar expression of face.

High and fierce delirium generally comes on about the second day; the patient requires two or three persons to hold him in bed; the eyes seem to burst from their sockets; rolling about with a fierce expression: death closes the scene on the third or fifth day; the fever subsiding and the senses returning some little time before; the eye now becomes glassy and is no longer red, the skin moist and cool; the vomiting ceases; the pulse full; syncope or convulsions, are the last and fatal symptoms: the former, particularly, in the most violent forms.†

When it attacks delicate persons, the fever is not so high; there is often no delirium, the vomiting is also more mild; the matter thrown up undergoes a gradual change; at first the remains of the last meal, then mucus streaked with

† This history is taken from Fowle, a writer in the Leeward Islands, and exhibits the disease in its worst and most common form there: In the northern latitudes its intensity abates.

and petechiæ have been observed in some cases, even from an early period.

I have retained to the last the mention of that symptom which gives name to the disease—yellowness of the skin, but it is not of that importance which might have been anticipated. Many cases indeed run through their whole course without exhibiting it; but when it appears early, or when the skin assumes a leaden or livid cast, it is to be considered an unfavourable symptom. A few other peculiarities in the disease are all that remain to be noticed. The yellow fever is occasionally attended with an ulcerated state of the throat. A fatal termination has often happened in the most unexpected manner; a very singular remission of all the symptoms taking place about sixty hours from the first attack, and raising hopes which are soon to be disappointed. Death is sometimes preceded by a degree of low muttering delirium; at other times the patient sinks exhausted, but with the intellect quite unimpaired.

Signs of moderate danger: A chill accompanying the disease; the longer its duration, the more favourable is it; the recurrence of chills preceding the fever every day, or twice a day favourable; a coldness of the whole body, without chills; coldness, with a profuse sweat; cold feet and hands, with febrile heat; a profuse sweat without a chilly fit, less favourable than a regular chilly fit, indicating, however, less danger, than their total absence during the course of the fever.*

A puking of bile, on the first day, favourable; of black bile, not unfavourable; also a soft, moist skin, at the beginning of the fever; increase of pain after bleeding; pain in the head, translated from external to internal parts, or to the back; a sore mouth; a moist, white, yellow tongue; an early disposition to spit freely; blood sizy, after other appearances of morbid action in the blood vessels; great sensibility in the sense of touch towards the close of the fever; and acute pain in the back or limbs.†

The following are signs of great danger and unfavourable issue; the fever coming on after a fit of anger, terror, excess of venery, or of strong drink; the first fit without a chill, or any premonitory sign; a coldness over the body for two or three days, and without chills; sleepiness on the first and second days; uncommon paleness of the face, not induced by venesection; constant vomiting without discharge of bile; obstinate costiveness, or a discharge of natural white stools; quick watery stools after taking drink; diarrhœa towards the close of the fever; a suppression of urine, most alarming when without pain; a discharge of black coloured urine; a cold, dry, smooth, shining skin; a yellow face on the first or second day; no pain, or a sudden cessation of it; a disposition to faint upon every little motion; a watery, glassy, or brilliant eye; a red eye on the fourth day of the disease, more alarming after being yellow; imperfect vision, and blindness in the close of the disease, a preternatural appetite in the last stage; a slow, intermitting, and shattered pulse; great restlessness; delirium, and lasting coma; black vomit, like coffee-grounds, after the fourth day; a smooth red tongue, covered with a lead coloured crust; insensibility to common occurrences; uncommon serenity of mind, and placid countenance;‡ all these signs, however, are indecisive, from the Protean character of the disease.

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blood, which comes from the fauces: The contents of the stomach are streaked with brown; then comes a blackish fluid like grounds of coffee, thrown up without difficulty, and without smell or taste: Excepting bleeding from the nose, this is the most fatal symptom: Hiccup and diarrhœa are also dangerous.§

* Rush, iv. 55, 56. † Ibid. iv. 57. 1809. ‡ Ibid. 55—61.

§ Fowle, Practical Treatise on the Yellow Fever in the Leeward Islands. Lond. 1800.

The usual duration of the yellow fever is from five to seven days. If the patient passes the sixth day without the occurrence of black vomit, or suppression of urine, his chance of recovery is much increased, but even then symptoms like those of common typhus occasionally supervene, and prove fatal. Relapses in this fever are very rare.

Upon dissection, very few appearances present themselves which can be considered as throwing light on the pathology of the disease. The body has been observed speedily to become livid. Yellowness of the skin has sometimes been first noticed to occur after death. A state of turgescence of the cerebral veins has been described, and occasionally there has been observed a peculiar redness of the inner coat of the stomach.

The gall-bladder is generally found distended with dark and viscid bile. The structure of the liver is not found to be altered. It sometimes assumes an ash colour.

Dr. Cartwright found the ganglia, their investing membranes, and the nerves, which issue from them, more particularly the semi-lunar ganglia, cœliac, and solar plexuses, of a scarlet and sometimes of a black colour. The psoas muscles, and the iliacus internus were black and easily torn. The pia mater, the brain were often, and the duodenum, except in two cases was always inflamed: The liver was generally more or less diseased: the stomach was also mostly inflamed: the coats of this organ, where no inflammation was found, were tender and easily torn.*

Inflammation of the stomach or duodenum is not the occasional, but the most general symptom of the disease. The red eye; the inflamed stomach; the black vomit resembling coffee grounds, and sometimes the orange-coloured skin, are the symptoms most commonly seen in this form of fever, and which almost invariably attend it.

Such are the most usual symptoms of the yellow fever. They will be seen to bear some resemblance to those of the plague, and the analogy between these diseases has been urged with much force by Sir J. M'Grigor. A more important analogy may be traced between the epidemic yellow fever and the genuine typhus fever of this country; and there can be no doubt, that the former bears the same relation to the endemic fever of the West Indies, that typhus does to the common *synochus* of Europe. It is properly called therefore the *typhus icterodes.* It is the *malignant* fever of tropical climates, characterized, like the malignant fevers of temperate climates, by deep-seated affection of the brain, and extreme irritability of the stomach, but in a higher degree of *intensity.*

The cause of the yellow colour of the skin in this fever has been made a subject of inquiry. By some this appearance has been attributed to disordered function of the liver; by others, to bile absorbed from the intestinal canal without hepatic derangement. Sir Gilbert Blane has thrown out the idea, that it may be owing rather to a depraved state of the red globules of the blood. In whatever way this question may be decided, it is perfectly clear that the state of the *biliary* organs has very little to do with giving

* Med. Recorder, for 1825, 6.

a character to this formidable disease, which is to be viewed as one of the most aggravated forms of typhoid fever. In respect of mortality, the yellow fever may even take precedence of the plague. At Gibraltar, in 1804, the disease raged among the inhabitants, uninfluenced by any distinction of age, sex, or condition.* The deaths amounted to somewhat more than one in three; a proportion, according to Sir Gilbert Blane, considerably above the devastation of the pestilence of the Levant.

The treatment of the epidemic yellow fever is a point which has attracted great attention from all classes of inquirers; but their observations tend only to show that it is a disease of so singularly malignant a nature, as in a large proportion of cases, to bid defiance to all the efforts of art. This is particularly exemplified when the disease first makes its appearance in any town or district. The peculiar combination of circumstances, whether in respect of local situation, or of the state of the atmosphere, or of the constitution of the inhabitants, which gives the peculiar feature of malignity to the symptoms of the disease, operates also against the practitioner, and deprives him of all his most powerful means of combatting fever.

To remove the sickness which generally appears early in this disease, copious draughts of warm water, chamomile or eupatorium tea may be taken till full vomiting is produced; and if the system is oppressed, that is, if the skin be cold, the pulse feeble, fluttering, and no re-action likely to take place, then the practice of Cartwright mentioned below is advisable: Should, however, the irritability of the stomach continue throughout the disease, it becomes necessary to arrest it: for this purpose lime-water and milk, given in equal parts, in the quantity of a wine glass full every two hours; spirit of turpentine twenty drops at the same interval; the carbonate of potash, ten grains, with a tea spoonful of lemon juice, or a table spoonful of vinegar; small doses of laudanum, eight or ten drops, with the same quantity of essence of peppermint; a blister to the stomach; sinapisms to the same part; the same applications to the feet have also been useful: charcoal† in the dose of a tea spoonful every hour given in a little syrup, is said by Dr. Archer to relieve the vomiting even in desperate cases, with the greatest success; it keeps the bowels also in a laxative state. Soda water, iced lemonade were also valuable assistants. In some cases, a solution of the acetate of lead, as recommended by Dr. Irvine, of Charleston, (S. C.) succeeded with Dr. Archer: in others, the nitrate of silver, where the charcoal failed. The charcoal has succeeded with Dr. Hill, of Wilmington, (N. C.) He gave it in lime water. C.

The severe head-ache which characterises the early stages of the disease, naturally suggested blood-letting as a probable means of relief; but experience has proved that, though occasionally, it is not generally beneficial. The blood, when drawn, separates very imperfectly; upon exposure to the air, it does not acquire its usual florid colour, and scarcely ever exhibits a buffy appearance.

From the description given by Fowle, it appears that the disease is frequently, when very violent, a variety of phrenitis. The remedies advised under the head of phrenitis and hydrocephalus, of depleting the system by cold water, &c. poured on the head, suggest themselves as the most appropriate; they should be continued as long as there is any stupor or redness of the eye, the patient being placed in a

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* Of a population of nine thousand, only twenty-eight persons escaped an attack of the disease.

† Med. Record. v. p. 71.

semi-erect posture. From the dissections of Fowle, who saw the disease in its most acute form, in a low latitude, there was but little disease of the stomach; the morbid appearances were found after death to exist in the turgidity of the vessels of the brain: In phrenitis, Abercrombie states, that by pouring cold water on the crown of the head from a pitcher, holding a basin below the chin, he has seen a man reduced to syncope, from the most violent and raging fury. Blood letting is the next most advisable remedy; which, though the author thinks is not generally beneficial, must be considered as our main stay in this disease.

On this subject, however, there is a contrariety of experience: Drs. Rush, McClean, Dickson, Bancroft, have succeeded with venesection, performed on the first or second day of the disease; Dr. Jackson advises it to be taken in large quantities, even to thirty ounces; it prepares for the cold affusion, which it also renders more efficacious: he prefers one large bleeding to repeated small ones, as the best means of arresting it. Natives of a northern latitude when attacked in a southern one, require copious and early venesection, particularly the robust, the young and plethoric; the acclimated do not bear venesection well, nor do the natives of hot climates: In the United States, therefore, much will depend upon the previous winter; if cold and bracing, and if the situation be generally healthy, the persons attacked in the summer are more likely to require bleeding than otherwise: but this is a matter of experience; in all wide spreading maladies as their character varies with the season, actual trial is the only certain test of the efficacy of any plan: When venesection is proper, it allays the fever, arrests the disposition to local inflammations, favours the operation of other medicines,—the bath or purgatives, arrests the progress of the disease and hastens recovery: It also prevents the supravention of dropsy and other disorders of debility. The blood exhibits every variety of appearance in this malady, and varies from the dissolved up to the buffy state. In employing it, however, it is necessary to guard against its excess, as it hastens the third or typhous stage. The practice of Dr. Cartwright of Natchez is peculiar in this disease: Instead of bleeding immediately, he thinks that in the first stage or that in which the heat was unequally diffused, sensation impaired, and secretion suspended, or, in other words, while the reaction was crippled and weak, emetics he found to have an excellent effect in preparing for venesection: an hour would elapse before the system appeared to feel the impression after taking the emetic; the irregular feelings of heat and cold and prostration throughout the system, gradually yielded to one of heat only; the heat of the skin became uniform; great "distress would ensue; then nausea, retching, and at length, full vomiting; first of phlegm, then of bile." The system then seemed to succumb under the violent struggle; and after the vomiting the patient became easy; a short sleep followed; re-action and general fever then took place, which was accompanied with a hot skin, violent pain, a full, tense, and strong pulse, with excessive misery. Tartar emetic given in the dose of from three to ten grains every one, two, or three hours dissolved in a small quantity of water, operated as a most powerful stimulus, rousing the organs from a state of palsy, with a slightly irritable stomach in the first stage, to a stage of open fever, with hot skin and hard pulse; then bleeding and purgatives were found useful in allaying the excitement which the tartar emetic administered in that manner had brought out; and mercury pushed to salivation afterwards, when the disease had been subdued, succeeded in eradicating it. By giving tartar emetic on this plan, the first stage, or that of oppression was shortened, the hot stage was developed, a malignant disease was converted into a mild one, and often cured. The patient, after taking it, bore bleeding better, and also purging: It was, however, only suited to the first or oppressed stage of the disease; for when given where the fever was established it had a bad effect: Dr. Cartwright's experience was taken from the excessively hot climate of Natchez: farther to the north, where the cold or oppressed stage is not so aggravated, this practice has not been found to answer; Dr. Archer,* and most of the physicians of Philadelphia, have found that emetics establish and keep up the irritability of the stomach, and hasten the formation of the inflammatory state of that organ. Dr. Cartwright also found that if bloodletting were used during the oppressed state, before the hot fit commenced, that

* Med. Recorder, vol. v. p. 70.

it quelled the efforts of the system to establish a general reaction, and rendered death certain, by debilitating the patient, and preventing the hot fit; but if he waited till the stage of heat was completely established, then bleeding was very useful: of this the continual request of the patient for cold air, cold drink, a tense, full, and hard pulse was a sufficient indication. Blood could then be taken away by quarts; it reduced the heat, alleviated pain; and produced a soft state of the skin and pulse, and increased the susceptibility to medicines; the secretions also became natural. Any direction of this kind will be found to apply only to particular seasons: Like all other epidemics, the yellow fever requires different modes of treatment; and of this the experience of Dr. Rush afforded sufficient proofs: the active treatment of 1793 did not apply subsequently. Accordingly, if from the trial of the remedies, the disease be of a typhoid character, purgatives of calomel and jalap will be the most proper plan of treating it; entirely omitting bleeding, or practising it in small quantities. This plan will particularly apply to the acclimated; it relieves the head-ache, the irritability of the stomach, and has all the happy effects of more active depletion without its debilitating effects. C.

The great object which it is found necessary to keep in view in the treatment of the disease, is the allaying that excessive irritability of the stomach, which leads to the black vomit. Calomel, given at first in a smart dose, so as to operate freely as a purgative, and repeated in smaller doses at intervals of three or four hours, so as to keep up this effect, was the most approved practice among the English practitioners at Gibraltar in 1813. To the calomel were occasionally united aloes and gamboge. In the exhibition of these medicines no time was to be lost; for it was only by their speedy and full effect, that the prevention or relief of the vomiting could be ensured.* Pedi-

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* After a full bleeding practised early the bowels should always be freely opened; and for this purpose calomel and jalap have been proposed by Rush; Dr. Cook recommends the ordinary purgative medicines as valuable in the following order; —calomel, aloes, rhubarb, jalap, scammony, colocynth, senna, and calcined magnesia: They produce coloured and consistent discharges, and relieve greatly: salts, castor oil and gamboge only produce serous evacuations:† Calomel is advised in various doses: Some prefer small and frequently repeated portions; others large: The French practitioners in Philadelphia, the judicious Dr. Monges and others, relied almost exclusively on the use of the gently purgative plan; they thought it had a good effect: a salivation, there can be no doubt, often suspends the disease and produces a rapid cure: this, however, is not always the case, as patients have taken this fever with a salivation upon them; and sometimes it has run its course in spite of the effect of mercury upon the mouth. Generally however, it arrests it: the great objection is its power of operation. The patient dies before the mouth is affected: Dr. Cartwright states that purgatives given in the first stage, or that in which the system was oppressed, sometimes produces secretions from the bowels, which were followed by a reaction; or a general febrile and heated state of the system: Whenever they produced copious, bloody, watery discharges or any highly irritative secretion, they were hurtful; If they were followed by a discharge of bile, they were salutary: Highly drastic purgatives, he thought very improper; because they debilitated excessively; and if the stools were serous, the patient became exhausted: When bilious they did good: the milder purgatives answered the purpose better than any other, particularly the castor oil: It is taken easily, and lies well upon the stomach.‡

The use of calomel, in the first stage of the disease, in the opinion of Dr. Cartwright produced generally no effect; and when it did, the ptyalism did not subdue or arrest the complaint: It was only after the system had been depleted by the lancet or by other means, that the salivation was salutary: It then produced a soft

† Med. Record. vol. viii. Essays on Fever, by Cook. ‡ Ibid. vol. ix. p. 30-1.

luvia, and tepid sponging were found beneficial. Under certain circumstances, the warm bath was administered with good effect.*

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skin and pulse, with a free secretion of bile and urine, and a return of feeling to the system: When the disease was permitted to run its course without depletion by the lancet, calomel, particularly when combined with opium, produced blackness, sloughing, and oozing of blood from the gums; or a temporary salivation, followed by hæmorrhages; both of which subside; heat, dryness of the fauces, an alkaline breath follow, with a dry skin and tense pulse, red scanty urine and costiveness: The mercury then excites an artificial fever which prolongs but does not cure the original one: His patients in this state generally died about the twentieth day; he however, gave to two an emetic, and they recovered: In giving mercury, he prefers small doses, so as to produce an effect sooner: It may also be excited by rubbing in the mercurial ointment in the quantity of ʒi every three hours till it disappears on the surface of the skin: Sometimes enormous quantities are rubbed in before it produces its effect: In some systems mercury may be given for months without producing any change on the system: Calomel has been taken to the extent of nearly three hundred grains, and at the same time twenty drams of ointment rubbed into the surface before any effect resulted.

A mode of exciting salivation in a rapid manner, by applying the fumes of mercury to the surface of the body and lungs, has long since been known in India, and deserves attention: Dr. Jackson, of Northumberland in this state, has succeeded with it in a short time; Pearson and Abernethy have also recommended it. The Hindoo plan is as follows, as stated in a letter from captain Sykes:†

"Our medical men produce salivation in twenty-four hours, and I have heard of a recent instance of its being produced in seven hours, by fumigation. My shastree, a learned Brahmin, asserts, that the practice of exciting salivation, by means of inhaling mercurial vapour, has been used by the Hindoos from time immemorial. Bees-wax is melted, and spread over strips of thin cotton cloth; an equal quantity of cinnabar in powder is spread over the waxed strips, which are then rolled up in the shape of candles. The person to be salivated is seated on the ground and a blanket is thrown over him; the lighted cinnabar candle is placed under the blanket, so that he inhales the vapour."

The mode, used by Dr. Jackson of Northumberland, consisted in subliming a mercurial preparation given below, and receiving it into the lungs and on the external surface: It is made as follows: "Two drachms of aq. amm. are added to six ounces of distilled water, and four ounces of calomel are thrown into this liquor, and shaken with it; the powder is then separated by the filter and dried.

"This is the preparation which was used by Pearson and Abernethy, for the peculiar fumigations recommended by Lalonette; but to this we shall add for the convenience of those who may not have the aq. amm. at hand, that the sp. amm. either simple or aromatic, is equally suitable. Rain or river water may be used when the distilled is not to be procured, and the medicine can be prepared in a single hour."

The instrument, used for this purpose, consisted of a common tin funnel; below which, was sublimed the powder, thrown in the quantity of ten grains on a red hot iron and inspired into the lungs; the powder is renewed, as it sublimes, repeating it from two to six times, at the interval of two, four, or six hours; it often salivates the attendants, if they are not careful: He has salivated a patient in twelve hours: applied to the skin, in the Indian mode, it must succeed earlier. C.

* In yellow fever, when the secretion of the kidneys had been suspended, Mr. Cartwright found that the administration of diuretics formed a valuable assistant in depletion; and equally so, as purgatives which in many cases only produce a serous debilitating and ineffectual evacuation: as soon as the diuretics began to operate, the liver and skin soon took on their appropriate secretions, and the disease yielded.‡

Diaphoretic remedies are generally too feeble to operate in this disease: Its march is too rapid: Sometimes in the experience of Cartwright, however, they tended to re-establish the secretions of the liver and skin, when other medicines

† Am. Med. Journal, vol. i. p. 324-5. ‡ Med. Record. vol. ix. p. 34.

Cold applications to the forehead and hands occasionally served to relieve the urgent headach.

With regard to the cold affusion, it must be used according to the rules formerly laid down under the head of continued fever; i. e. when the pulse and temperature are steadily above the natural standard: If used when the skin is cold, pulse low, feeble, and fluttering; great shivering and coldness are the result, without fever; the disease passing at once into the last stage, in which all the symptoms are of a typhous character:*

The efficacy of this remedy is confirmed by many authorities; by Dr. Miller, of New York, O'Leary and McClean: In 1793 in Philadelphia, it did not succeed: Like all other remedies, it fails in many cases, though its general usefulness is unquestionable. In the cases in which it was tried in New York, it succeeded in all in which it was used, in the first days of the disease: afterwards it hastened the fatal catastrophe.† Calomel was given at the same time, though no salivation was produced. The temperature may be reduced in hot climates by putting salt in the water before the affusion, if it cannot be got from springs of a temperature sufficiently low.‡ The other means formerly mentioned of sponging the body with vinegar and water, spirits and water, æther and water, to cool the surface, care being taken to place the patient in a current of air, so that he may not be stimulated by the inhalation of the æther, will be found useful. C.

When the powers of life appeared to fail, it is unnecessary to say that stimulants and cordials were had recourse to.§ Subacid

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were of no avail. The well timed use of more active remedies and plans generally, however, preclude their use.‖ Dr. Archer of Norfolk in the year 1822 found, that after bleeding in the first thirty-six hours of the disease and free purging with calomel and jalap, a complete diaphoresis succeeded: For this purpose the cold affusion, and if that failed, sponging the skin with hot vinegar and water, at the same time giving the patient copious draughts of hot lemonade, balm or sage tea, and covering the patient up in the bed, frequently cut short the fever, and cured it completely: The diaphoresis allayed the vomiting: and in the last stage, the infusion of serpentaria greatly assisted in this object: Frequently, the use of the James powder with small doses of calomel, was useful: its effect, however, in increasing the irritability of the stomach too often contra-indicated its tendency towards the skin.

Epispastics when thought necessary should be of the most active kind: They are useful in the stage of prostration before the hot fit begins; or in that of debility after it is past: The most active should be used: sinapisms will generally be found to answer better than blisters:¶ and to prevent the formation of the diseased action of the stomach, equal parts of the nitric acid and water, as practised in the eastern cholera, applied over the epigastrium, is valuable: The volatile spirits of ammonia, applied by dipping a piece of muslin in it, will also be found to be useful: Sinapisms may be applied to the ankles, wrists, and to the spine, to excite the system, either in the cold or debilitated stages of this complaint. The spirits of turpentine, alone or boiled over cantharides, is useful from its speedy action and excessive irritation. The tincture of capsicum, with violent frictions of the surface, are found to be valuable; in fact, in the last or typhous stage, even these are often useless. C.

* Cartwright's Essay in Med. Record. vol. ix. p. 35.

† Thomas' Practice, p. 91. ‡ Ibid.

§ The articles formerly mentioned under the head of typhus fever, will in this stage be proper—sinapisms, blisters, poultices of horseradish, to the wrists and ankles: Carbonate of ammonia, musk, opium, castor, wine, brandy, with nourishing soups, and the farinacea: The sulphate of quinine, the bark, in powder or decoction, with the mineral acids, and if the bark be not retained, it may be given in injection.** The room should be perfectly ventilated; and the most perfect cleanliness observed about the person. C.

‖ Med. Recorder, vol. ix. p. 34. ¶ Ibid. p. 36. ** Thomas' Practice, p. 92.

drinks were given, and a strict antiphlogistic regimen pursued through the whole disease. The same rigid attention to diet and regimen were required during the period of convalescence.*

In general, this disease is of an inflammatory character, the use of stimulants, therefore will be improper; opium has always been pernicious except in the last or typhus stage: Dr. M'Lean states that it was useful when convulsions took place, and when there was delirium, towards the decline of the disease, it produced sleep; as soon as the remission is fully established, the sulphate of quinine, or any mild bitters, the quassia, columbo, and angustura, will be then found to be valuable. The genuine angustura, is thin, smooth, of a yellowish coloured fracture, and of a bitter aromatic taste: The poisonous kind is less thick, white or yellowish white, gray in its fracture, on the inner edge yellowish, approaching to brown, of an unpleasant bitter taste, and with a little aroma.† The latter is equally noxious with nux vomica in its effects. C.

I have stated, that among the points in dispute regarding the yellow fever, is the question of the identity of the epidemic yellow, or Bulam fever, with the endemic fevers of the West Indies. Upon this question an opinion has already been given.

The three signs ordinarily believed to identify the yellow fever; the red eye, black vomit, and inflammation of the stomach, appear in the fevers of summer in the east and west: The yellow fever assumes all the types from the intermittent to the continued; the black vomit, thought to be so peculiar to it, occurs in the agues of Minorca, and the red eye also is found in the bilious fevers of this country: Fevers of all kinds, particularly those of any particular season, vanish into each other by such insensible gradations, that it is impossible to draw an exact line of separation between them, except as to intensity; which is best measured by the rapidity with which they produce death, or derange the important functions of the system: Thus, the intermittent, the remittent, and continued, and typhus fevers of summer and autumn, the cholera and dysentery of the same seasons, change into each other, are owing generally to the same causes, and are cured by the same treatment, and differ principally in the intensity with which they attack different organs, particularly those more immediately necessary to life. C.

The other topics of controversy are, first, whether the disease be always imported, or whether it can ever be generated by a combination of *common* or endemic causes;—secondly, whether, being once received into a town, it propagates itself by contagion; and thirdly, whether those who have passed through the disease are susceptible of it a second time. These are all important questions, the replies to which are not so obvious as to that of its pathological affinity, which has already been under discussion; and they involve the most difficult parts of the controversy.

The first question is undoubtedly one which should be answered with some caution. Many circumstances connected with the early appearance of the epidemic yellow fever at Philadelphia in 1793, and in Gibraltar in 1804, strongly favour the idea of its having

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* For many of the remarks contained in this chapter, I beg to express my obligations to Dr. Fraser, Deputy Inspector of Hospitals at Gibraltar, who has obligingly given me access to his voluminous and valuable documents on the yellow fever.

† Thomas' Practice, p. 93.

been in those situations an imported disease. Several other facts however might be adduced, which militate against the universality of this doctrine; and there is nothing inconsistent in allowing that, though it is sometimes imported, the genuine malignant yellow fever may, under circumstances favourable to its developement, be generated in any warm climate by a combination of endemic causes. With regard to the second question, no reasonable doubt can surely be entertained by any candid, intelligent, unbiassed man, that this disease, being once received into a town, is contagious. The evidence in favour of this opinion is certainly as strong as for that of the contagion of typhus, or of plague. Whether the yellow fever bears the greater analogy to the former or latter of these diseases, may indeed be disputed. We may deny that there is any thing *specific* in the contagion of yellow fever; but that the disease is propagated by contagion of some kind, cannot be questioned, after the ample experience which has been had, both in America and Europe. If any doubts could have been entertained while the disease occurred only in the West Indies, in consequence of the resemblance of the epidemic to the endemic fevers of those islands, they must have yielded to the obvious arguments suggested by its appearance in Cadiz, Gibraltar, and still more lately at the Island of Ascension.* The contagious nature of the disease, it may be remarked, is a question which is perfectly distinct from that of its foreign or endemic origin.

Some of the laws of the contagion of yellow fever appear to be ascertained with tolerable accuracy. Its latent period varies from two to eight days. Ten days is, I believe, the longest period recorded of yellow fever appearing, after exposure to the contagion, and removal to a freely ventilated atmosphere. The contagion of yellow fever has a peculiar range of atmospheric temperature, but on a higher scale than that of the plague. It has never been known, but in those countries and at those seasons when tropical heats, that is, of eighty degrees Fahrenheit's, or upwards, prevail. It never fails to disappear as the winter approaches. It is certainly a singular circumstance in the history of the yellow fever, that it has never prevailed to any extent at a distance from the sea, nor, except in a few instances, but on the shores of the Atlantic Ocean.

It has been observed by Dr. Cartwright, to occur in a small town at a distance from any great water near Natchez, and to be produced in that situation, by the putrefaction of animal substances. The repeated facts from the interior of our country, on the lakes, &c. leave no doubt upon the mind, that nothing but sufficient putrefaction is required to produce this disease, independently of the Atlantic or any other ocean: The author surely should recollect, that at Batavia it is the yellow fever, which destroys so many Europeans every year; It occurs also in other parts of the East Indies: It is by no means unfrequent in Bengal;† Cleghorn speaks of the black vomit in the agues of Minorca: What particular

* Consult Dr. Burnett's "Official Report of the Fever which appeared in his Majesty's Ship Bann, and the Island of Ascension, in 1823." London, 1824.

† Wade on the Treatment of Fever in Bengal, p. 75. 1793. Lond.

quality can be connected with the Atlantic ocean, it is difficult to conceive: The supposed distinctive qualities of the yellow fever, the black vomit and red eye, occur in the fevers of the interior of this country: They even show the malignity of the plague in some instances.*

The last circumstance which it is of importance to notice in the history of the yellow fever and the laws of its contagion, is the question whether it can be taken a second time. The answer is a very short one. Although a few well attested instances to the contrary have been recorded, still a most extensive experience has satisfactorily proved, that the immunity from second attacks is nearly complete, and that it forms one of the most striking characteristics of this remarkable disease.

This by no means accords with our experience in this country. The yellow, like all other fevers, of course, leaves the person less susceptible: the debility produced by it alone will be sufficient to account for this fact: Dr. Rush, relates many instances where it was taken a second time, and some of which were in the same season. At New Orleans the same fact has been amply confirmed. Dr. Potter in the following note expresses his opinion, on this interesting question: C.

The annals of our country put this at rest. It is true, that in countries uniformly hot, the disease is seldom observed to occur more than once in the same subject, but in all countries where the winters are cold, we find very little difference in the susceptibility to the cause. The emigrants from St. Domingo, were exempt from the yellow fever of 1797 and 1810, in this city, (Baltimore,) but in 1819, 1821, they suffered as much, cæteris paribus, as any other variety of the human species. I have remarked in my notes of 1821, that since 1793, I have attended more than a hundred persons in a second attack—*Twenty-one* in a third—*Seven* in a fourth—*Three* in a fifth, and one in the eighth attack of yellow fever. P

The diseases of plague, intermittent, and remittent fevers, and yellow fever, appear in the hot season, they are therefore principally to be dreaded by strangers going to hot countries: They attack the young and plethoric, and those coming from the north: Depletion of all kinds has been found useful to prevent these diseases: At Batavia, a gentle purge of sulphur given daily, prevented the disease in a whole ship's crew:† a continued perspiration has been said to answer the same end. Exercise in the open air before the heat of the day, is particularly valuable; and if obliged to do any duty, or labour in the sun towards noon, it should be as short as possible: All the plans of prevention should be carried so far only as is consistent with the strength: fatigue and debility should be avoided: all excesses are therefore improper: The diet should be plain, simple, moderate, digestible, and nourishing.

Pork is considered, in hot climates particularly, an improper food, as it frequently predisposes to diseases of the skin: mutton, beef, and fowls, boiled will be most proper, avoiding all spirituous liquors, particularly punch; porter, lemonade, beer, or wine, may be taken:

Habit, of course, renders proper in different individuals various kinds of diet; that which is most eaten in their youth, is generally digested with the least expenditure of strength: To Europeans and Americans, it will be found, that the above articles are most nourishing, and keep the system in a healthful and easy state; butter and fruit, should be taken sparingly; turtle and sea-fish are healthful: Dr. Rush advises a proper mixture of vegetables, and that no sudden transitions from an animal to a low diet, should be made, as it would have the effect of bringing on the disease; suppers are hurtful: the highest degree of strength consistent with health should be promoted, and this is best done by a diet of animal food, with a small admixture of vegetables.

Cold bathing is very common in hot countries; to the intemperate, it is danger-

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* Hildreth's paper. Philadelphia Journal for Nov. 1824.

† Rush, vol. iv. p. 193.

ous; Dr. Clarke goes so far, as to consider it as mortal: It is not advisable, where there are obstructions of the liver and spleen: of all people, water drinkers are always safest in warm climates: the only objection to abstinence from ardent liquors is, that the appetite becomes too good; the effect of this, however, will be obviated by taking an aloetic pill occasionally, or some gentle cathartic medicine.

If the country, which a stranger visits is very unhealthy, besides depletion by one or two bleedings, and purges, a gentle effect of mercury on the mouth will be advisable, and a very temperate life; a salivation, however, does not always succeed. Clarke recommends, that in Dominica, officers and men returning from fatiguing duty, should be purged freely to prevent the fever: Wade says, that in India, they should be taken before the new and full moon; it has been conjectured from the recession of the tides at these periods, that the exhalations are greater; of course the causes of disease are more active.* The French from their more temperate habits in the West Indies suffer less than any other people.

The necessity of the reduction of strength before removing to a warm climate is shown, by the effect of the climate on those, who have resided long in it. They become debilitated, from the relaxing effect of the heat, and the perspiration; the consequence is that they are not subject to these violent diseases, and when they are attacked they recover more rapidly. It is also shown by the circumstance that direct depletion prevents it. The loss of blood saved a whole regiment in the West Indies lately arrived from France: in 1741, it prevented the yellow fever, in many persons in Virginia.† Foreigners should avoid the wet and rainy seasons of all tropical countries—from March to December. Confinement in the middle of the day; avoiding the morning and evening air, and sleeping in the open air in the night; the use of umbrellas, or other protection, when in the sun; flannel worn next the skin; good shoes to keep the feet dry; cloaks to prevent the effect of the chilly, morning and evening air, will be found to be useful:

The black hat often produces apoplexy from the excessive heat of the sun in tropical countries: the change at sunset, when the dew falls suddenly and heavily, cannot be easily appreciated by a native of a northern climate, till he has witnessed it: these remarks apply to the valley of the Mississippi; the same dress, and mode of life is proper there as in India, which is that just specified.

The residence should be on a high, airy, and dry situation; and if this is impracticable, the highest apartment of the house should be chosen to sleep in; it should be furnished with a small stove and a fire to ventilate the room; in all cases, particularly in cold climates, the use of fuel should be free, if the room be damp and chill: Many diseases of the army arise from moisture and cold: The windows fronting marshes should be shut: Smoking and drinking to excess should be avoided: The rule of Celsus, "Si qua intemperantia subest, tutior est in potione quam in esca," applies better to temperate than to warm climates: Intemperance in drinking is particularly dangerous in hot countries: Early rising, and retiring early, and bathing in cold water, will be salutary: Wet clothes should be changed as soon as possible, and all debilitating circumstances avoided.

With regard to the health of soldiers, Pringle recommends that trenches should be made round tents to lessen the moisture of the ground, and drain off the water, without wetting the straw, and other materials liable to be injured; the frequent renewal of straw, airing the tents by frequently opening them, to make every thing about them dry, should be carefully attended to: the mattrasses of the officers should be raised from the ground, which should be covered with an oil cloth, to intercept the vapour, keeping the tents airy in all seasons; the banks of large rivers, provided they are dry, sandy, and high, are most favourable situations for an encampment; airy villages, not too much secluded by trees, which are removed from water, are most healthy for the same purpose.‡ Frequent removal of a camp, to choose a new and clean situation; the establishment of deep privies, throwing a thick layer of earth into them daily, till the pits are full, and then digging others; always in situations to prevent the reigning wind of the season from blowing over the camp, deserve attention. The hospitals should be small, well aired, and venti-

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* A paper on the Prevention and Treatment, p. 95. Lond. 1793.

† Rush, vol. iv. p. 195. 1809.

‡ Rush's Pringle, p. 37. 1810.

lated; open airy barns and churches are to be preferred to close houses, as hospitals, in summer; those who have inflammatory diseases will not bear to be removed with the army; the typhus patients are benefitted by it; this however applies, Dr. Rush states, to removals in summer; in winter it does injury: The patients in each hospital should be few; in winter hospitals, chimneys should be used; stoves never; a cabin, with a fire in the centre, and a hole in the roof to let the smoke pass, the beds being arranged round the fire, formed, during the war of 1776, good hospitals; the smoke was only disagreeable during the time of kindling the fire: Plenty of good food and drink, of fuel, with comfortable clothing, regular exercise, at proper times, are also to be attended to.*

In hot countries, the expeditions undertaken by soldiers should be short and rapid: six weeks' exposure has reduced an army so rapidly as to threaten its existence. The buccaneers in South America always retained their health, because they did not stay long in one place. Soldiers should in all tropical climates be regarded as children, who must be taken care of by the vigilance of their officers; natives should be employed in hot climates to do any duty at night along shore, as, to northern men, it is invariably fatal: The occupations alluded to are, burying the dead, cutting wood, &c.; and if the men get sick, the best place for them, both to prevent further sickness, and to recover from it, is in a clean well ventilated vessel in the middle of a river: the well should take the bark twice a day, and purges twice a week.† C.

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* Rush's Pringle, p. 99. 1810.
† Clark on Long Voyages.

CHAPTER IX.

MILIARY FEVER.

Symptoms—Causes—Type—Treatment.

SYMPTOMS.

The symptoms of the miliary eruption* deserve to be here noticed, as it is by some considered as a fever of a distinct species. Numerous small red pustules, preceded by a roughness produced by cold, appear upon the skin: Distinct, sometimes in clusters, so prominent as to be easily felt but not seen, often of the colour of the skin, they produce in ten or twelve hours a whey coloured vesicle, which soon becomes white. When the state of the vesicle is a little more inflammatory, the pustules are red, and the fluid, in them, turns yellow: in two or three days they fall off in scales. The fluid is acrid and of a bad smell: on the neck and breast they are first seen; they appear and disappear repeatedly in the course of the disease: The degree of fulness, redness, and its steadiness after it comes to the surface, determine the character of the eruption, for it is favourable in proportion.

The symptoms of fever often increase before the appearance of the eruption; pricking and itching in the skin and bowels, with numbness of the extremities, particularly of the fingers and toes; delirium, pain in the head, ringing in the ears, pungent heat in the back, a sour rank profuse sweat, with a small pulse often precede the eruption: also epilepsy, inflammation of the eyes, with a watery state of them, and aphthæ: these symptoms are relieved by the appearance of the sweat, which, if not checked, causes the continuance of the eruption for many days.

A moderate sweat, free breathing, without much debility or depression are favourable symptoms, and the contrary.

A watery discharge from the bowels, kidneys, or a salivation preceded by restlessness, sickness, anxiety and a sense of sinking, attends even those cases which are without fever: the red variety is less frequently accompanied by fever than the white.

Miliary fever may be considered as sometimes dangerous, as the patient dies, if the perspiration is suppressed; this, however, often occurs from the excessive debility, produced by the copious discharge exhausting the system.

CAUSES.

A damp atmosphere, excessive evacuations, particularly of blood, copious menstruation, fluor albus, a bad diet, a moist and marshy air, intemperance, excessive venery produce it. The old and the very young, and women, are more subject to it than men or the more robust: offending matters in the primæ viæ produce it;

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* We are indebted for the facts and descriptions of this essay to the work of Wilson Philip, vol. i. p. 296.

and it is removed when they are discharged. In spring it is most common; in autumn next; summer next; and, lastly, in winter it is least frequent: changeable weather is most favourable to it.

TYPE.

The type of this fever generally inclines to typhus, from the excessive discharge by the skin which accompanies it: When it occurs in a typhus it is generally white, and when in synocha, it is red, owing to the increased impetus of the blood.

TREATMENT.

With regard to the treatment of miliary fever, it is to be managed in the same manner as other fevers, only so far as the eruption modifies it. The application of cold is regulated on the same principles as stated above, when the disease is synocha; and when the temperature falls nearly to the natural standard in typhus cases, instead of cold applications, sulphuric acid and alum, and the bark will be found to be valuable.* If the stomach is oppressed, if there be headach, nausea, eructations, griping, or swelling of the belly, an emetic becomes necessary, with diluents; avoiding at the same time excessive dilution, for fear of increasing the sweat, and of course the debility. The connexion of the miliary eruption with a disordered state of the stomach must be kept in view.

With regard to the retrocession of the eruption, as a cause of subsultus, delirium, &c. there can be no doubt but that it is owing entirely to the exhaustion produced by the perspiration; its regulation must therefore be managed with judgment; exposing the patient to cold air gradually, by first lightening the bed clothes, giving him cold drink, &c.

If there be inflammation in the viscera, or if the fever be violent, particularly when it arises in inflammatory habits, accustomed to high living or the abuse of spirituous liquors, or from the suppression of the lochia, bleeding becomes necessary: When the sweat retrocedes and is attended with subsultus tendinum and other typhous symptoms, the use of cordial and stimulating medicines become proper; as, musk, ammonia, camphor, &c. as above recommended: the system must under all circumstances be supported, as debility is the principal feature of the disease to be guarded against.

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* Philip, vol. i. p. 307.

CLASS II.

THE EXANTHEMATA, OR ERUPTIVE FEVERS.

CHAPTER I.

THE EXANTHEMATA IN GENERAL.

Objects of Inquiry in this Chapter—Character of this Order of Diseases—Their Relation to Simple Fevers—Defined Character and Course of Exanthematous Fever—Defined Character of the Eruption—Their Occurrence but once in Life—Exceptions to this Law, and attempts to explain them—Their Origin from Specific Contagion—Relation of the Exanthemata to the other Morbid Poisons—Peculiarities of Specific Contagions—Communication by Inoculation—Latent Periods—Incompatibility with one another, and with other Diseases—Criticism on Dr. Willan's Arrangement of the Exanthemata—Their Connexion with Diseases of the Mucous Membrane.

OBJECTS OF INQUIRY IN THIS CHAPTER.

The class of exanthemata, or eruptive fevers, is that to which our attention is next to be directed; and as the diseases which it comprises present many points of analogy, and several peculiarities which distinguish them from other complaints,* it may be advan-

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* We call small-pox, measles, and some other eruptive fevers, *specific* contagions, because they are accompanied by a more uniform train of symptoms than other fevers, always communicating their own similitude, except any deviation that may arise from a difference of constitution. They are diseases that can only be imparted once to the same body; but there is another difference, if not a peculiarity, in the character of specific contagions. They require the aid of no exciting or other cause to bring them into existence, and develope all their phenomena. If the cause once impinge upon the nerves, nothing can entirely avert its consequences. Such is not the effect of other agents acting as remote causes. Marsh miasmata, a low temperature, and many other causes that lay a predisposition, may disable one or more functions of the body, and thus predispose them to disease; but the effect of such agents may pass away, and never be followed by

tageous to offer some general remarks upon the class, previous to examining its component parts in detail. My object on this occasion will be to point out the pathological relations of the exanthemata, and to give a general idea of the objects of investigation in the five following chapters. With this view, I shall direct my attention to the relation which they bear to simple fevers, to one another, to other diseases arising from morbid poisons, and to cutaneous diseases. These objects of inquiry involve the consideration of some of the most important laws which regulate the phenomena of disease, but they can only be very briefly touched upon in this place.

CHARACTER OF THIS ORDER OF DISEASES.

Idiopathic fevers were formerly stated to be of three kinds, continued fevers, intermittents, and the exanthemata. The latter may be viewed as continued fevers, to which an eruption is superadded; and a great deal of what has been said regarding the general doctrine of simple fever, particularly all that part which relates to the prognosis and principles of treatment, will be found equally applicable to the case of fever complicated with eruption. The consideration of the exanthemata naturally follows that of fevers strictly so called; by such an arrangement we shall be able to exhibit, in a connected view, all the leading doctrines of febrile disease.

The genuine exanthemata are small-pox, chicken-pox, cow-pox, measles, and scarlet fever. There are a few other diseases of lesser importance, which, as allied in some respects to these, may be arranged in this division of the work, under the title of the minor exanthemata; but our attention in this chapter will be exclusively directed to the former. The following is the common character of the exanthemata. 1st. They are marked by the presence of fever, which runs a defined course. 2d. They are attended with an eruption, which like the accompanying fever, goes through a regular series of changes. 3d. They occur to every individual once, and only once, during life. 4th. They arise from *specific* contagion.

THEIR DEFINED CHARACTER.

1st. The first peculiarity of the exanthemata is the defined character and steady course which the accompanying fever exhibits,

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the diseases that would result as consequences, if an additional cause were superadded.

The distinction between the exanthemata and other inflammatory fevers of the greatest importance in practice, seems to be the deceitful weakness of the pulse, which seems to be occasioned by the impression made by the poison upon the nervous system, impairing the contractile powers of the heart, while some of the viscera labour under great congestion, and some under inflammation. P.

under almost every variety of external circumstance and habit of body. Here we trace a very marked and obvious distinction between exanthematous and common continued fever. It is a feature however in the character of the exanthemata, which, though applicable as a general principle, requires to be received with some qualification. It is strikingly illustrated, indeed, by the phenomena of small-pox and measles, but it is less distinct in the scarlet fever; and in the cow-pox and chicken-pox, very little fever is discernible at any time. The *character* of the exanthematous fever, except in the case of one form of scarlatina, is inflammatory, and this it assumes in the young and the old, and in all varieties of climate, season, and situation. The regularity in the *course* of exanthematous fever is well shown in the three days of the eruptive fever of variola, and the eight days of its fever of maturation. These curious facts form a striking illustration of the doctrine of critical days in fever, and of that principle of periodic movement in the animal economy, regulating many phenomena both in a state of health and disease, to which we formerly referred. It is a singular circumstance, that this corroboration of the doctrine of critical days should not have been known till above a thousand years after that principle in pathology had been inculcated.

Upon the whole subject of the peculiar nature of the exanthemata, we differ considerably with the author, and these are our reasons.

I. He states, that these diseases are marked by a steady and defined course. We proceed, then, to examine them with regard to all the modes of this attribute. With regard to the duration of their fever, observation proves that they are equally as varied as the phlegmasiæ, or any local inflammation with fever; as to small-pox, this is entirely true; its fever continues for one, two, or three days, or sometimes it is without fever entirely; thus the varioloid, which is now acknowledged to be the same disease as small-pox, (for by inoculating with the matter of the varioloid the small-pox is produced,) often has no fever, or a fever from the slightest degree up to that of the most malignant small-pox: the variolous fever also occurs without the eruption, as in the epidemic small-pox mentioned by Sydenham:

With regard to measles and scarlatina, the same is true; in the measles, the sore eyes and throat, and eruption appear without fever at all; at other times, the fever is slight, continuing from one day to eight or fourteen,* before the eruption appears.

Scarlatina also commences with a mild fever. Bateman describes its simplest form as merely a rash, with almost no fever or illness, or with a moderate degree of it,† whilst its most violent form produces death sometimes on the third‡ day: and, as Schultzius says, upon the first or second.§ So much for the degree of fever; like the phlegmasiæ, &c. as we have stated, it occurs with the mildest affection of the general system up to the most severe: a defined and steady *degree* of fever cannot then be considered at all as a distinguishing feature of the exanthemata.

If we judge of this characteristic by the description given in the books of a particular form, it will be easy, by taking that as the standard, to find instances which will tally with it; thus, like intermittent fever to a person who has read Cullen's description only, it will appear to consist of a series of changes, succeeding each other with the greatest regularity; but when we consult nature, this is not found to be the case; intermittents are found of every variety of degree; with chill, without it; with a fit, consisting wholly of chill, or wholly of fever; and of fever

* Rush, vol. 2, 426. 1809.
† Bateman, p. 69, 70. Phil. 1824.
‡ Withering, 1779, p. 8.
§ Ibid. p. 32.

with chill and without sweat, of sweat alone, or running through all the variety of permutation, of which these different phenomena are capable; as regards duration, kind, and every other quality, also in addition exhibiting even the combination of all other diseases, of some of the exanthemata, nay, of even the itch,* which is generally considered to be the product of an insect: It is difficult to reason on a subject so as to produce conviction, where the dogmas of the schools and of books are taken as the criteria rather than those of nature; the creeds, the assumptions, and too often fictions of the science, as taught us in our early youth, recur to blind the eye to nature, and lead us astray from the open road to truth: they rise, like the ignis fatuus of the night, or the mirage of the desert, to delude and to decoy; addressing the ear alone, they place one sense in rebellion against all the others, and against the mind itself, and give it the rule of the whole reasoning powers; with such a pilot at the helm, the syren song of imaginary excellence occupies us, whilst the whole circle of disease, its endless variety of phenomena, its dangers and their remedies, should be the paramount, the engrossing subjects of thought.

The author, then, is wrong, when he draws a line of distinction between continued and exanthematous fever, by saying that the latter is more regular; for in all its forms, it occurs in every variety of degree. This is true in fact of almost all diseases; thus, to a person acquainted only with books, pleurisy is one of the simplest and most regular forms of the phlegmasiæ, yet it occurs complicated with all varieties of fever, from the simplest intermittent to the highest state of inflammatory, or the lowest typhous fever: in its lôcal symptoms, from a variety, in which there is no pain whatever, to the most acute and sensitive state of the local affection; it is complicated with inflammation of the lungs, of the bowels, and even the muscles of the chest, which has, in some instances, run so high as to be attended with sphacelus, and sloughing of the side.† Appeals to nature only can decide this matter.

With regard to the regularity of the course of small-pox given as a good illustration of the doctrine of critical days in fever, and of the disposition of the system to observe certain states and periods; this is sufficiently disproved by what has been said above, that fever in the varioloid and small-pox occurs in every variety from its lowest and almost imperceptible degree, up to one that continues for many days. The evil of this disposition to introduce mathematical precision in disease, however, is not confined to doctrine, it has a material influence upon practice; thus, with regard to vaccination, when perfect, it is said to require a regular stated period of three days after the insertion of the matter before the pimple inflames; and the formation of the areola by the eighth day; and then to secure the system from danger from small-pox; and this dogma has been taken as certain, and great feeling has been excited by doubting it, among the sectarians created by this great blessing: the varioloid, however, follows, and often in a violent degree; and though it is true, that experience is, as yet, in favour of the idea, that it prevents death, yet it produces a great deal of suffering; now, if upon the appearance of the varioloid, or the small-pox, in a country, those persons already vaccinated were again revaccinated, even where the original vaccination was perfect in all its stages, it is evident, that much pain might be obviated; and if, further, after vaccination, we inoculated with the varioloid, premising diet and purges to prepare the system, little danger could be feared; whereas, according to the present belief, that the perfect disease is regular in its stages, and by it the protection is complete, it is evident, that there is great risk; vaccination, like all other forms of cutaneous disease, is susceptible of various degrees, both in its progress from the smallest blush of inflammation, up to the regular vesicle; and there can be no question, that it is so also with regard to its protecting power; for we discover every variety of varioloid after vaccination, from the mildest form without fever up to the most perfect small-pox; the belief, then, that vaccination, like all other forms of cutaneous affection, varies in degree, is the safe principle upon which to act with regard to its protecting power. But, it is also supported by facts already observed; Bateman tells us, that though the irregular vesicles of the vaccine disease, describing three which bear that name, do not always protect

* Lind on Hot Climates.
† Huxham.

the system from the occurrence of small-pox,* yet sometimes they do, and that there may probably occur other irregularities, and that their protecting power may exist only to a certain degree: Even Dr. Bryce, who was attached to the certainty of the distinctions which are laid down for ascertaining the true vaccine, states, after exhausting his ingenuity on this subject, that with regard to the true affection of the constitution by vaccination, which protects the system from the small-pox, he knows no criterion but revaccination.† Thus neither is the most regular vaccination, nor even its irregularities, to be exactly measured in their preventive power. This precise and mathematical mode of defining and measuring out the predispositions of the system, and the phenomena which arise upon them by the action of morbid agents, in producing the endless variety and combinations of disease, leads to error, and is entirely incompatible with the true character of the system.

With regard to the statement, that the exanthemata are always inflammatory with the exception of scarlatina which is typhous in its character, it may be stated, that Dr. Rush describes the scarlatina of the years 1783-4, as exhibiting in some cases, inflammatory symptoms, and as requiring several bleedings. The pulse was hard; and the blood was covered with a buffy coat; these occurred in the cold weather.‡ He says also, between the years 1793 and 1800, it was inflammatory, and required bleeding.§ This disease is, therefore, modified by season, as all other fevers are, and exhibits in the autumn sometimes inflammatory symptoms. With regard to the general statement, that the exanthemata appear to be steady under almost every variety of circumstance, this also is not borne out. Dr. Withering states that the scarlet colour was kept up, in scarlatina, during the hot months, and that, when the air became colder, it nearly disappeared; that it was both less frequent and less permanent.‖ He states, also, that those who lived on high and gravelly situations suffered greatly; whilst those in wet, low, or sheltered places, were hardly affected with the disease. The symptoms of this fever, Dr. Rush states, became less alarming towards October; the general fact, however, stated by Sydenham, with regard to these diseases, that they appear most commonly at particular seasons, shows that the state of the air has some effect upon them: thus, he says, that the small-pox usually begins about the vernal equinox; if violent, however, it appears in January: The measles appear in January, and increase till about the summer solstice, abating in the same gradual manner, till the same period next year: the scarlet fever, he states, usually appears about the close of summer; all these facts go to show that these diseases are materially influenced by the seasons, and though the times of their appearance, as stated above, are by no means regular, yet they are sufficiently so to show that the opinion advanced in the text is not correct:

Dr. Rush states that the measles of 1801 was strongly marked by remissions and intermissions, like the prevailing autumnal fevers:¶

A cold and damp spring sometimes renders the measles, otherwise a mild disease, peculiarly fatal: Doctors Rush and Huxham** have both made this remark: Adults also died in greater numbers than the young people, in the epidemic described by Huxham, showing the effect of constitution on this disease.

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* Dr. Rogers and Pendleton, of New York, also state some further varieties, which still were sufficient to protect the system from small-pox; as the anticipation of the regular period of the vaccination, and its passage through them in a shorter time: thus the mahogany scab was formed on the 8th instead of the 14th day, and vesicles, in which suppuration takes place on the 3d or 4th day, the scab of a soft texture, resembling that formed in Porrigo, and totally distinct from the dark mahogany-coloured scab of the genuine cow-pox, and yet they were genuine and had the full preventive power: they also state, that the virus retained its virtue after being kept six years,†† showing that even in the qualities of the scab, which may be regarded as the last result of the inflammatory process, the small-pox does not differ from the cow-pox in the long preservation of its powers.

† Bryce on Inoculation for Cow-Pox, Appendix No. X. p. 114. Edit. 2d.

‡ Rush, vol. ii. p. 410. 1809.

§ Ibid. p. 419.

‖ Withering, p. 12. Lond. 1779.

¶ Rush, vol. iv. p. 117. 1809.

** Ibid. vol. ii. p. 432.

†† New York Medical and Physical Journal, vol. i. p. 320, et seq.

The measles, as described by Quier in Jamaica, affected the bowels principally, showing the effect of the climate; in northern countries its tendency is always to the lungs, the prevailing character of diseases of those climates; Like the fevers of Jamaica, also, the fever was distinguished by remissions and intermissions; it preceded the eruption five or six days: Quier states that the measles also differed greatly, in different people, in the manner of its attack; the same author states, the most healthy were most frequently the subjects of it, whilst the delicate and weakly, escaped almost without any disease.*

The same is true of the small-pox; it is inflammatory generally as the author states; but it is much influenced in its character, by circumstances; thus in the epidemic of New York in 1823–4, it attacked principally those between the age of twenty and thirty, and the poor; showing that exposure and vicissitude, and strength of system have their influence; Its severity, it appears, was regulated by the age, habit and previous health of the individual.† The small-pox are sometimes of a low grade of action from the commencement; this is the case, where the pocks do not fill, or are ichorous or vesicular in their character. The state of the fever depends entirely upon the state of the system, when the small-pox invades it; if debilitated, the patient, even when inoculated, dies of typhus;‡ There is nothing peculiar in the character of the eruption, to make it either inflammatory or otherwise. These are important facts; depletion even in a strong person may produce typhus; and as in the weakly, typhus is often the result, it shows the impropriety of inoculating persons in that state.

To suppose that the accession, the duration, and the violence of these diseases, are not influenced by external circumstances, is as unreasonable as to expect, that they would do equally well under all kinds of treatment: The weather, age, previous constitution, are all circumstances, which increase or diminish the force of the motion of the heart, and of course must affect the disease.

If the author means to state, that the fever in these diseases is steady and defined in its character under all external circumstances, always exhibiting the same symptoms, though they may differ in degree, this also will be found not to be true: Constant nausea and puking, was a prevailing character of the measles of 1801, in Philadelphia: Its premonitory symptoms differ; Thus Dr. Quier of Jamaica, observed white apthous specks about the gums, visible several days before the eruption, and before the patient is sensible of any indisposition; these specks spreading and increasing in size, at last extend down the pharynx: Dr. Hazeltine has also observed an eruption on the gums, previous to the appearance of the disease; Gum boils, and sores upon the tongue, have been observed by Dr. Rush. Toothach, epistaxis, deafness, tinnitus aurium, headach, coma, and epilepsy have all been observed as symptoms of the fever. Affections of the lungs, from the slightest cough to the most violent pneumonia, both acute and chronic; a constant expectoration which proved fatal; also cynanche trachealis;§ also all the varieties of bowel affection, nausea, vomiting, diarrhœa and dysentery, in all its intensity.‖ The time of the attack from the exposure to the contagion, also varies; Withering generally observed it, after the third or fourth day's exposure to the infection; Rush, about the fourteenth, sometimes earlier and sometimes later:

Dr. Rush also observed considerable variety in the time of the eruption, and in the abatement or continuance of the fever after it; in its colour being deeper, livid or pale, in the redness being equally diffused or in blotches, or in eruptions like the small-pox; the latter is also noticed by Cullen and Sauvages: In one case, the eruption remained for nine days, and disappeared without the branny scales, which usually follow it.

The sequelæ are equally various; Dr. Rush observed a fever of the intermittent kind, in another case, typhus mitior: a great variety of eruptions on the skin; porrigo, ecthyma, &c. also affections of the eyes, ears, and mesenteric glands, consumption, &c. Huxham mentions diarrhœa, ulcers of the jaws, hectic, &c.¶

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* Quier's Account of the Measles of Jamaica. Lond. 1778.

† N. Y. Med. and Physical Journal, p. 202. vol. iii.

‡ Quier, p. 90. 1778.

§ Rush, vol. ii. p. 425–6. 1809.

‖ Ibid. also Quier on Measles.

¶ De Morb. Epid. vol. ii. p. 137. 139.

The scarlet fever is described by Withering, as exhibiting complete trismus, and something like hydrophobia: These symptoms, with delirium, headach, coma, convulsion, and idiocy, which followed it, make up almost the whole round of nervous disease: He states also, that when the cold weather appeared in the fall, that pneumonic and intestinal symptoms became common in all their variety: Watson also describes dysentery, and even mortification of the rectum, as one of its symptoms: sphacelus in the lungs, also was discovered in another.

A discharge behind the ears, and from the nose, with a slight eruption; a pain in the jaw, swellings behind the ears, and a slight fever; persons walking about till death, give an idea of the varieties of this malady, as they occurred to Dr. Rush, in the years 1783–4. With regard to the small-pox, we will say nothing farther here: Like all other diseases, it receives a character from the state of the system, and from external circumstances. As to these diseases, we, therefore, cannot agree with the author, that their course is either defined or steady, or that their character, in any one respect, is uninfluenced by climate, season and situation: Further, we believe that in two different epidemics of either of these forms of fever, no two exactly resemble each other, and that experience only can determine the best mode of treating them, directed by the general doctrines of fever, before delivered: To suppose that there is one regular undeviating train of symptoms, is to state what nature will not justify, and what the character of medicine cannot support.

DEFINED CHARACTER OF THE ERUPTION.

2. The second character of the exanthemata is drawn from their being attended with an eruption which goes through a regular series of changes. This is another of those remarkable facts in the animal economy, for which we may find some analogies, but which we shall never succeed in explaining. The appearance of the eruption in each of the diseases of this class is peculiar, and except in some severe cases of chicken-pox, can hardly admit of any doubt. The progress of the eruption in each disease is also peculiar, but it is uniform. That of scarlet fever shows itself on the second day, and declines on the fifth. The eruption of measles shows itself on the fourth day, and fades on the seventh. The eruption of small-pox shows itself on the third day, and maturates on the tenth. To this regularity of progress in the exanthematous eruptions there are a few, and but a very few exceptions. In the inoculated small-pox the eruption is sometimes postponed from the ninth to the twelfth day; in the measles from the fourth to the sixth, or even later. The most remarkable exception is that enjoyed by the cow-pox, which has the characters of an *exanthema* without the occurrence of any eruption; but the regular progress of the vesicle and areola are sufficient to entitle it to its present place in the nosology. Even this sometimes varies, for without any obvious cause the vaccine pimple occasionally remains dormant for four or five days, and is not elevated before the sixth or seventh day. These cases, however, are rare, and they only serve to teach us caution in framing our general positions. An inquiry into the course of each particular eruption will form a prominent feature in our account of the respective disease. The exact *nature* of the eruption is not always well understood, as in the case of measles and scarlet-fever; but in that of small-pox it is genuine inflammation.

That the eruption, in these diseases, goes through a regular series of changes, does not exactly comport with the phenomena: 1. With regard to the small-pox: The small-pox, varioloid, chicken-pox, and vaccine, are varieties of the same disease; with regard to the small-pox and varioloid, this is pretty generally conceded, because they cannot be separated by any distinctive marks, and are mutually communicated by inoculation:* The varioloid and chicken-pox are also the same, differing only in degree; they run into each other by insensible gradations. The proof of this statement will, however, be given more particularly, under the head of modified small-pox: We may here mention, to connect the vaccine disease in this analogy, that inoculation with the matter of small-pox has produced the vaccine disease in the cow, according to the experiments of Dr. Carpenter. Great varieties appear in the eruption: It sometimes, assumes the appearance of a single slight pimple, which never suppurates, but dies away in one or two days: This happens in the pocks of the varioloid; it happens in the small-pox, some of the vesicles of which are found to be small; it happens in the small-pox, when inoculation is practised the second time, when often the pustule of inoculation does not suppurate, and yet will communicate the disease.†

In all these cases, the pock occupies a small point of the surface, yet it is genuine: From this small point, which does not suppurate up to the most mature pustule, covering the skin from the breadth of half an inch to a universal bleb, which covers the whole surface, which runs its course in from one or two, to ten, fifteen, or eighteen days, the pock varies. The qualities of the contents, also, assume all varieties; they contain either water, bloody serum, or pus, in every degree, (as far as our senses inform us,) of which the local disease of the skin is capable: The eruption is, therefore, not regular: Besides, the fever of these exanthemata, is found without pustules, as in the variety mentioned by Sydenham; and there are pustules, without fever, as in the single pocks, produced on the arms of nurses, (who have had the small-pox before,) from the contact of children, who have the small-pox; the pustules rise to various heights, are sometimes attended with fever and sometimes are not; and though they have not come to suppuration, and have not excited fever, they will communicate the disease: In general, the pox, resulting from a second inoculation, after the person has had the disease previously, go through their changes faster, than inoculation for the first time; they are as far advanced by the third day, as the first inoculation is by the fifth; and are attended with general fever and pain of the axilla at times, and sometimes not; but they never rise so high, nor are so hard, nor is the inflammation so extensive in the second, as in the first insertion:‡ These facts show that these pocks (which, from their communicating the disease are genuine,) admit of degrees, and that the appearance of variola is by no means regular; but has a most extensive range in its characters:

It is so also in the character of the eruption; It is vesicular, and never suppurates; or it is a compound of vesicles and pustules: The crystalline, in which the contents of the pock are watery, are always connected with typhus,§ and it is owing to this low grade of action, that the fluid of the pocks is transparent and not purulent: Other eruptions are also produced by the fever of small-pox; as in the cases described by Sydenham, in which blebs, like those of pemphigus, breaking and ending in mortification; the disease was then highly inflammatory and the pemphigus appeared to be owing to this cause;‖ also a shining pellicle covering the pustules and secreting a bloody water; enough then has been said to show, that in small-pox every variety of pock with regard to size, number, extent, quantity and quality of the secretion, from water to the most mature pus, has attended this disease:

Let us examine the measles: This disease is united with the character of the small-pox, by the appearance of pustules of small-pox interspersed with the erup-

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* See Dr. M'Nevens' paper on the Varioloid, N. Y. Med. and Physical Journal, p. 216. vol. 3. also Dr. Bell's, p. 207. vol. 3.

† See Quier's account of the Small-pox at Jamaica, p. 77, 78.

‡ Quier's account of the Small-pox in Jamaica. 1778. Lond.

§ Philip on Febrile Diseases, p. 387. vol. i.

‖ Rush's Sydenham, p. 229. Philadelphia.

tion of the measles, so as to give rise to a species in the nosology of Sauvages, called the variolous; Cullen, Huxham, and others, acknowledge the same thing; and Dr. Rush notices it:* It has appeared in one case, united with the varioloid eruption in Philadelphia this year: The local symptoms of measles, appear with an eruption which is distinguished by an efflorescence on the skin, in which there appears slight elevations, to be felt by the touch; these occur on the hands, wrists and fingers in the form of pimples, and sometimes, they are as large as miliary vesicles on the neck, breast and arms;† on the best authority then, the eruption of measles varies, from the most inconsiderable rising of the vessels of the skin not to be perceived, but felt, from a miliary vesicle, to a pock, like that of variola.

With regard to the time of the appearance of the eruption, Philip describes it as occurring on the second, also on the fifth or sixth day, or later, and in the latter case, of being protracted till the twelfth, fourteenth, or twentieth day.‡ In the malignant measles, described by Dr. Watson, the eruption appeared on the second day,§ and it generally continued four or five days, and sometimes longer: Bateman says, it fades on the tenth: Dr. Rush states, in the measles of 1783, the eruption usually began on the third or fourth. Sydenham in one epidemic, mentions, that they appeared sometimes sooner and sometimes later than the fourth, whereas, in a former variety, they always appeared on the fourth: This last, he called a regular form, and as there have been but few writers on this subject since Sydenham's time, and as all appear to have copied that great man, the adoption of the fourth day for the appearance of the eruption in this disease, appears to be derived from him: There is, therefore, considerable variety from the second to the fifth days, in the time of the appearance of the eruption; Dr. Rush mentions a case, in which the eruption and fever occurred at the same time: Bateman states, that it appears on the third, fifth and sixth days of the fever, though usually on the fourth: The regularity of the period of the appearance of the eruption, is then by no means fixed: it will depend much upon the intensity of the fever, which, as in that described by Dr. Watson, appeared on the second; in mild and moderate cases, it may be postponed till the fourth, but these cases establish the rule, only for that peculiar class and not for all varieties of the fever.

The scarlatina, which resembles measles so much as once to have been believed to be the same disease, sometimes appears with small red spots, broader, redder, and not so uniform as the measles: These, according to Rush, appeared with considerable variety in 1783, 4; Sometimes it preceded and sometimes it followed the sore throat; in a few only it occurred on the second or third day of the disease.‖

In the scarlatina described by De Gorter, he states, that after three or four days' continuance of the fever the eruption appears; He states in general terms, that the term of their continuance is short: Morton mentions, that the scarlet eruption appeared on the fourth, fifth, or sixth day of the disease, and that it continued for seven, eight, or ten days:¶

Sennertus describes it as appearing on the fourth or fifth day of the disease, and that it fades on the seventh or ninth day: In the epidemic scarlatina of Berlin, the rash also appeared on the fourth or fifth day.** Withering describes the eruption, as appearing on the third day,†† and as abating in two or three days. These facts are sufficient to show, that the rash of the scarlet fever is by no means regular in its appearance on the second day: Besides this irregularity in the appearance of this eruption, it is sometimes in the form of pimples, of vesicles, and even of pustules, which, in some cases, have been so distinct, as to give rise to a variety, termed the scarlatina variolosa, as seen by Sauvages, and a minor degree of the same eruption, like the chicken-pox, as seen by Dr. Rush:

Bateman mentions the existence of pimples on the breast and extremities; The appearance of these pustules in measles and scarlatina are rare; as the pustule is the result of the phlegmonous inflammation, whilst the action of the vessels in these diseases is generally so weak as not to amount to inflammation; These facts

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* Rush, vol. ii. p. 427. 1809.
† Bateman, p. 57. Philadelphia edition, 1824.
‡ Philip, p. 438, 9. vol. i.
§ Med. Obs. and Inquir. p. 139, 40. vol. iv.
‖ Rush, vol. ii. p. 407.
¶ Exercetat. 3. cap. 5. p. 53, 54.
** Acta. Berol. Med. vol. i. p. 20.
†† Withering, p. iv. Lond. 1779.

are sufficient to show that the local affection of these fevers is by no means regular, either in the time of its appearance nor in its character; on the contrary, it is found to vary from the slightest blush of the skin, as in those cases of scarlatina, in which there is almost no fever, or indisposition, to a pimple, a vesicle, and a pustule, in fact exhibiting almost all the varieties of cutaneous inflammation: The position, in the text, is therefore not sustained.

Here it may be said, that when a pustule appears upon the skin in scarlatina and measles, that it may be the result of the variolous poison, acting on the system: it may be so; this is, however, hypothetical; the phenomena exist together, and we are justified, in stating them as varieties of these diseases, and more particularly so, as we see every day, that a slight degree of inflammation will produce redness; increase it, it becomes vesicular; increase it still further, pustular; if it be increased rapidly, the blisters are filled with bloody serum, as in pemphigus, and the cases of small-pox, quoted from Sydenham: In fact, the whole history of these diseases convinces us, that they differ principally in degree, and that this is exemplified by the state of the eruption, as well as by the fever, which exhibits all varieties from the slightest fever, or none at all, up to the most decidedly typhous or inflammatory form; and the local affection, from the slightest pimple to the most perfect pustule, and that all these varieties have appeared in each of the distinct forms of exanthemata, which the author has described as distinct diseases. It would, indeed, be easy to show from the author's own views, that these principles are the only ones which can preserve him from inconsistency: Thus he states, speaking of Willan's arrangement of the varieties of cutaneous affection, that there is no possibility of separating them into different species, that they vanish into each other from the slightest blush of inflammation to the most malignant pustule; this view is true; it is supported by the various changes of the exanthemata into each other: How then can he consider the local affections of the exanthemata above mentioned, as different from those which appear in other forms? He considers the fever of the exanthemata to resemble continued fever, with the difference of only the addition of an eruption: how then can they be separated in their various characters from these diseases?

These views are important in a practical light; they teach us to adapt our means to the case, and prescribe according to the symptoms in a rational manner; if, for instance, scarlatina is believed to be always a typhous disease, when it is sometimes inflammatory, and small-pox, and measles, always inflammatory, when they are sometimes typhous, the patient must suffer:

This practice of imposing fixed definitions on phenomena which are variable in their nature, and whose changes the terms of the definition does not include, always leads to error and tends to enslave the minds of those, who think more by words, than by ideas; who practise more by routine, than observation. It is easy, when the definition of a disease is laid down, to determine whether it belongs to the species or not; and after having laid down certain definitions, which embrace the whole ground, it is easy to show that the common forms belong to them, but when we find nature varying infinitely, these nosological trappings must be laid aside as useless ornaments, and we must rest solely on the phenomena, which nature exhibits to guide us in our practice.

THEIR OCCURRENCE BUT ONCE IN LIFE.

3. The occurrence of the exanthemata to every individual once, and once only, in the course of life, is the most curious and characteristic feature in the history of these diseases. That every race of man, under every possible variety of climate, age, and constitution, should be susceptible of the same disease, that this disease should present every where the same character, and run through the same stages, and having once occurred, should never again appear in the same individual, though exposed to the utmost malignity of infection, are facts in the history of the animal economy, which may well excite our curiosity. The general accuracy is unquestionable, at least so

far as the constitution of the human body allows us to acknowledge any such widely extended proposition.

EXCEPTIONS TO THIS LAW.

Here, indeed, as in every other part of pathology, exceptions occur. A few constitutions have been met with, which appear to be completely insensible to the contagion of small-pox. Some individuals, who cannot be made to take the small-pox or scarlet fever at one age, are yet susceptible of it at another.* In like manner it is established on undoubted evidence, that small-pox and measles may occur twice in the same individual. Some pathologists have refused to acknowledge the truth of this exception to the general law of the exanthemata, and have attempted to explain away the cases of secondary small-pox, by presuming on the ignorance or the carelessness of the practitioner in attendance. These and similar frivolous arguments do not admit of serious refutation. Such exceptions have undoubtedly occurred; and it is our business to watch nature, and not prescribe to her the course which she is to pursue.

No doubt whatever can be entertained with regard to the occasional occurrence of second and even third attacks of scarlatina. They are sometimes milder, sometimes severer than the primary.

The occurrence of the exanthemata to every individual, once and once only, in the course of life, as stated by the author, though it is true, to a certain extent, yet it admits of more modifications, than he has embraced in the above remarks;

1. With regard to the small-pox;

The varioloid, varicella, vaccine, and variola, are varieties of the same disease; and as the varioloid occurs in many persons who have had the small-pox, at every return of this epidemic, it is evident, that the position of the author, as far as regards the small-pox, that it can be taken only once during life is untenable; the small-pox it should be said is taken frequently; the author admits, that it can be taken twice; instances are recorded of its occurring thrice in the same individual, in its most violent form. But it is taken often in its moderate varieties; thus the chicken-pox, the varioloid, and the vaccine, are all taken after the small-pox. The true view of this subject, is, that the predisposition to the small-pox and all its varieties exist in endless degrees; thus it is generally acknowledged, that the vaccine renders mild and comparatively harmless the small-pox; that the small-pox exhausts, but not completely its own predisposition to return again immediately after it is passed from the system: this is proved, by the occurrence of two successive crops of small-pox in the same case, in three days after the first, as happened to Quier;† also by the inoculation of persons, who have had the small-pox, with small-pox matter; the inserted matter produces a pock which runs its course in a shorter time, and is sometimes attended with fever, but which can communicate by inoculation the disease to another, whether attended with suppuration in the inoculated vesicle, with swellings in the arm-pits and fever, or without; The varioloid disease, also, does not exhaust at once its susceptibility, for it, also, is followed by successive crops of pustules in the same attack, and so is the chicken-pox; when the disease ceases for that time, it shows that the susceptibility is exhausted so far as not to be immediately reproduced by ordinary circumstances of contagion, and as they both recur in the same individual afterwards, it

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* Huxham. Treat. on Fevers, Small-pox, &c.

† Quier's account, p. 82.

is proof positive that it may be worn out, and recovered again: as the disease may recur in the form of chicken-pox, varioloid, or small-pox, it shows also that when renewed it may also exist in every degree.

The susceptibility for the small-pox, in different parts of the same system, is different; thus, we see, small-pox in full maturity, the crystalline, the horn-pox, running their full course, whilst between the pustules, we find some smaller, and smaller, terminating in hard tubercles in one, two, or three days.

The vaccine disease also, does not exhaust its susceptibility to a reproduction immediately: Like the small and chicken-pox, it is subject to a succession of eruptions, though it is a rare occurrence: Pendleton and Rogers saw a case, in which pustules appeared on the back and on the elbow of a patient, in whom the regular pock of vaccination had nearly come to its decline; Dr. Post, also saw a case of vaccination, in which vesicles going through their different stages, appeared on different parts of the body;* It is proved, also, that those eruptions, which occur, generally over the skin, after vaccination, have the power of reproducing the disease,† showing, that it is still the vaccine: These facts prove the necessity of a second eruption to eradicate the susceptibility.‡

Also, it has been ascertained by experiments, that re-vaccination, after the kine-pox has previously completely affected the system, will produce a considerable irritation, followed by a scab; a third and a fourth vaccination, is succeeded by less and less irritation, and smaller scabs, till the fifth has no effect; the scab, the result of a fourth vaccination, however, had the power of reproducing the disease in three instances; it retained its power, though it was not more than a line in diameter:§ Thus, then, it requires four vaccinations to exhaust the susceptibility of the system to this disease: It appears then from undoubted facts, that the small-pox has been communicated twice and thrice to the same individual, and that in general, the remaining susceptibility after having had it, admits of the varioloid, the vaccine, and the chicken-pox, all appearing in the same individual, and after a case of genuine small-pox, the inoculation with genuine small-pox matter, also takes so far as to propagate the disease from the inoculated pustule; and with regard to the vaccine, the same is true; the susceptibility to it is often exhausted by repeated vaccinations only: How then is it possible to say after the direct reproduction of these diseases after each other so frequently, both in the natural way and by inoculation, in the same individual, that it is a law that they can appear in the same system but once during a life:

We have seen that the eruption of the measles, runs by insensible degrees from a blush, a pimple, a vesicle into the genuine small-pox pustule, and that in its fever, it is found in varieties from almost no fever at all, up to one that lasts for fourteen days; Running through these various degrees, we must conclude that the predisposition to its return also would exhibit the same variety, for the affection of the parts depends upon the degree of the predisposition: This is the fact: as the author states, it is taken more than once. Dr. Baillie records eight instances; Dr. Willan and Dr. Rush, saw also several. The true view of predisposition to the measles is, that it may exist in endless degrees; thus, the whole system may be susceptible of its influence, though the eruption does not appear; for cases are recorded, where the fever has taken place without the eruption;‖ and this fever may be accompanied by the eruption from the slightest degree, up to one which is most decided and strong: This fact has been observed by Dr. Rush: all the catarrhal symptoms with fever, diarrhœa and extremely sore mouth, were observed by him in the measles of 1773, without the eruption, except in some instances, when it was trifling. An author in the Edinburgh Medical Essays, mentions the same thing; he says, he saw the fever and all the other symptoms of measles with-

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* New York Med. and Phys. Journal, vol. i. p. 320. † Ibid. p. 113.

‡ Vaccination also sometimes produces death; Dr. Rogers and Pendleton, mention one case, in which this result took place by the extension of the erysipelas over the body: Woodville also records one instance:¶ It also analogises with small-pox, &c. in eradicating other maladies, as crusta lactea, ophthalmia, scrofula.**

§ Dr. Darrach's Experiments, in Philadelphia Journal for 1824.

‖ Philip, vol. i. p. 442.

¶ New York Med. and Phys. Journal, vol. i. p. 320. ** Ibid. p. 115.

out the eruption:* this partial appearance of the symptoms occurred without the predisposition being exhausted, for the last author mentions, that the same person had the disease months or years† afterwards.‡ Dr. Rush farther mentions, that in 1789 he saw all the other symptoms of measles with a small and trifling eruption about the neck and breast in some cases only:§ Sydenham also saw the eruption on various parts of the body, without first affecting the head and breast, and coming out irregularly; and the fever so slight as not to end in scales:‖ The irregularity of the eruption shows that the fever was weaker in its tendency to the skin, as also does the absence of scales: The fever only may be present, or it may be attended with an eruption varying in degree; the predisposition must also vary in these respects: accordingly, in some, the disease has been kept off by these partial affections for months, in others for years, as we have stated above:

Sometimes, a second fever and eruption takes place after the first has disappeared, showing that the predisposition was so strong, that one attack was not sufficient to overcome it. Sometimes the eruption appears without the catarrhal symptoms, and when it declines, a second eruption appears with violent disorder of the constitution,¶ showing as above, the various nature of the predisposition, that it is not exhausted by one attack; sometimes (as in inoculated small-pox, when there is no fever and no pocks but the one produced by the inoculation,) the measles appears with local symptoms only, without fever or general eruption; in fine, so various is the predisposition, that the fever appears of all grades, from the mildest and hardly perceptible degree up to the most severe, ending in peripneumony, coma, convulsion, dysentery, spasm, and gangrene of the rectum, &c. the same thing has been shown of the eruption; it occurs from the mildest blush up to the most perfect pustule: and after the most mild, as well as the most violent forms, the disease has reappeared;** With regard to scarlatina, the same thing may be observed.

1. It is taken twice and three times by the same individual. This, it is true, has been denied by the most respectable authority: Our author states under the head of scarlatina, that it is taken even twice or thrice by the same person;

The susceptibility varies in the same manner in scarlatina, as in the preceding diseases; It varies in the character of the eruption, from a simple blush without and with red points,†† pimples,‡‡ watery vesicles,§§ to pocks like chicken-pox;‖‖ The latter variety, called the scarlatina variolosa, has been noticed by Sauvages, as stated above:

Scarlatina in its susceptibility, resembles the small-pox and measles; for such persons as have previously had this fever without the sore throat, have taken the sore throat and had no eruption, whilst those, who had previously the sore throat, have a scarlet eruption, without any affection of the throat.¶¶ The fever, also occurring in every possible degree, shows the various susceptibility of the system to the operation of the poison: Indeed, it is said, that cold alone produces scarla-

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* Philip, vol. i. p. 442. † Rush, vol. ii. p. 428, 9. 1809.

‡ It may be said, that this fever was not the fever of the measles, but a prevailing remittent: Dr. Rush puts this beyond question, by observing, that, 1. He never saw it affect any but children, in the degree that has been mentioned, and such only as never had the measles: 2. It affected whole families at the same time, and proved fatal. 3. It ended in a pulmonary consumption in one case, with the symptoms, which attend that disease, when it proceeds from the measles. 4. It affected a child in one family on the same day, that two other members of the same family were affected by the genuine measles. 5. It appeared on the usual days of the genuine measles, from the time the persons effected by it were exposed to its contagion; and 6. It communicated the disease in one family in the usual time the disease is taken from the genuine measles.

§ Rush, vol. ii. p. 428. ‖ Sydenham, p. 377. Lond. Ed. 1676.

¶ Willan on Cutaneous Disorders, order iii. part i.

** Baillie, Transactions for the Improv. of Med. and Chir. Knowledge, vol. iii. p. 258—63.

†† Withering, p. 5. 1779. Bateman's Synopsis, p. 69. Philadelphia, 1824.

‡‡ Ibid. §§ Withering, p. 116. Plenciz, quoted by him. Ibid. p. 42.

‖‖ Rush, p. 411. vol. ii. ¶¶ Rush, vol. ii. p. 430, 1. 1809.

tina; Withering mentions, that persons after eating oat meal, muscles, (musculus edulis,) and sweet almonds, are sometimes affected with a scarlet irritation of the surface resembling scarlatina.* There is another circumstance, which separates the exanthemata from other fevers in the minds of many medical men; It is, their not requiring exciting causes, as cold, fear, fatigue, &c. to bring them into action, as common fever does; This may be in some measure true. As to scarlet fever, however, Dr. Rush found that a purge prevented its appearance, after the person was exposed to its infection, as it does common fever; Dr. Sims had made the same remark; vomits also completely checked it in the forming stage,† which shows that the operation of its causes as in common fever, can be abated, and of course, if in their stead stimulating agents had been applied to the system, a contrary effect might have resulted: Small-pox and measles are both mitigated by diet, &c: The subject is yet in its infancy. Though these diseases are without doubt possessed of a character of wearing out their susceptibility to return, yet this we believe to be much less than has been imagined; as soon as they have been examined with the same scrutinizing eye, as small-pox, this position will be more generally maintained: and more particularly when it is considered, that since Sydenham, there have been but four or five original writers on measles; and that the other diseases of the class have also been observed with an attention equally general.

Attempts have been made by pathologists, to explain the causes to which secondary attacks of the exanthemata are to be referred. Sir Gilbert Blane believes, that the first attacks are always, or nearly always severe; and he argues, therefore, that the secondary attack is owing to the susceptibility of the constitution to the disease being in such individuals *stronger* than in others. Dr. Wells, on the other hand, apprehends, that where a secondary attack occurs, the first will be found to have been mild; that the susceptibility therefore is not greater in these cases than in others, but that the primary attack had not been sufficient to *saturate*, as it were, the constitution. The phenomena of modified small-pox, which have lately attracted so much attention, hinge upon this question. Perhaps it will be found, that neither of these explanations is altogether satisfactory, and that the occurrence is attributable to some peculiarity in the constitution of the individual the precise nature of which does not admit of being developed.

THEIR ORIGIN FROM SPECIFIC CONTAGION.

4. The last feature in the general character of the exanthemata is their origin from specific contagion. I have already (page 80) explained the difference between the several kinds of contagion, and pointed out a few of the most important principles involved in the doctrine, more particularly such as relate to the operation of *common* contagion, and are subservient to the pathology of fever. An origin from specific contagion is a character of eruptive fevers, but they possess it in common with many other diseases—the plague, psora, syphilis, and hydrophobia. It is this character indeed which associates the exanthemata with that tribe of diseases

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* Withering, p. 62, 3. Lond. Edit. 1779.
† Rush, vol. ii. p. 419. Ed. 1809.

which have been designated by the title of the *morbid poisons.* This phrase has been invented to distinguish these disorders from such as arise from mineral or vegetable poisons, or the exhalations of marshes. It is supposed that the poison in all the diseases now alluded to, is produced from an animal body already in the state of disease, and therefore it is called a *morbid* poison. The plague has been considered by some authors as an exanthematous disease, but we have elsewhere given our reasons for believing that it is more nearly allied to the typhoid fevers. The yaws or frambœsia is a peculiar disease, which arising from a morbid poison, and running a defined course, may perhaps be admitted into this class.

That these diseases also require a peculiar state of surrounding circumstances to concur in their production, is certain: They will not spread only at certain seasons; if they are introduced they die away: a case of varioloid of the most decidedly dangerous character, occurred at West Point some years ago; it was the only one, among many families; no person had visited the place with the disease, and it ceased with that single case; where did it originate? From the air? Huxham observes, that the small-pox ceases, unless there is a state of the air favourable to it:* The fact, that the disease dies in certain seasons, when introduced, and always, even when most epidemic, shows that some other circumstances are necessary than simply the infection: The idea that it arises only from a small portion of matter inserted into the system, without taking into view the predisposition, has had a pernicious effect on the practice: Purges, no doubt, prevent the scarlatina; and as the small-pox, measles, &c. are of all types, dependent upon the state of the system, which arises partly from the air, it is clear, that in our preparation for these maladies, we must be much regulated by something more than the disease, to avoid the contagion arising from the virus: external circumstances have much to do with it: The rules for the treatment and prevention of common fevers, without doubt apply equally to the exanthemata. C.

PECULIARITIES OF SPECIFIC CONTAGIONS.

Of the nature of the specific contagion in each of the exanthematous diseases, we are completely ignorant, and the subject is altogether inscrutable. It is quite clear, however, that it is something of an exceedingly subtile nature. A single vesicle of cow-pox contains sufficient of the specific matter of contagion, to communicate the disease to an incredible number of persons. A single drop is sufficient for each, perhaps a small portion of a drop, and of that there is reason to believe that the bulk consists of the common serum of the blood. The multiplication of this morbid poison in the body of the affected individual, is wholly inexplicable. The older physicians applied the analogy of vegetable ferments to the explanation of the phenomenon, and certainly with much ingenuity. The doctrine of a *materies morbi* is satisfactorily proved in the case of small-pox, cow-pox, and syphilis, and the old humoral doctrines have doubtless therefore some foundation in nature. Whether they can be extended so as to explain the phenomena of

* Huxham, p. 14. vol. i. 1788.

some corresponding affections, and perhaps of certain others whose pathological relations are not so obvious, may in future times become an object of inquiry.

The author in speaking of the inscrutable nature of the contagion of exanthematous diseases, brings up the old doctrine of essences, as if the nature of a body was something different from the qualities it exhibits: Every natural object is to be known, only so far as it is cognizable by the senses, and no farther, and the information, thus obtained, or the phenomena are all we know or can know; and when we note down what we see, we do all that can be done. Beyond it there is nothing to be known; the doctrine of the essences of things, as it leads the mind to speculate beyond the phenomena, or actual qualities of bodies, has done much harm, by leading to idle surmises and theories. Not contented with knowing all that can be known, we invent more and fill the science with error. The exanthematous fevers, their contagion, and all their other properties are to be known only by the observation of their sensible appearances: Farther, they are as inscrutable as gravity, magnetism, electricity, or any other principle. C.

The exanthematous contagions were for a long time confounded. Small-pox and measles were for many centuries believed to arise from the same contagion. The measles and scarlet fever were considered by Morton to be the same disease, nor was the diagnosis clearly established until lately. Some pathologists at present believe there is an affinity between the contagions of small-pox and cow-pox; and within the last few years, the notion of the identity of small-pox and chicken-pox has been revived. The origin of all these contagions is involved in obscurity; but though we cannot form the most distant idea how they first got into the world, we can yet in many instances trace, with some precision, the periods when they first began to spread as epidemics. It is a very remarkable circumstance, that the exanthemata, and the several morbid poisons associated with them, were unknown to the ancient physicians, and did not appear in Europe till after the birth of Christ. To ascertain the countries in which these diseases originally appeared, and from which they were propagated over the rest of the world, will prove an interesting subject of investigation.

The diagnosis of small-pox and measles, was not attempted till the year 1785, by Heberden; some doubts, we think, may still reasonably be entertained on the propriety of the absolute distinction of these diseases: it is certain, if we take as a principle, that the measles in their regular form, observe certain periods, it is easy to find examples to bear us out in the position: but when we find other varieties as above stated, in certain seasons, equally common, we must say that nature does not always act in one uniform manner: They vary according to the predisposition, constitution, &c. Heberden states, that "the measles and scarlet fever sometimes resemble one another so much, as not to be readily distinguished; though this be a matter of importance, because the method of cure is different:"* to this we reply, that scarlatina is treated by the same active depleting measures, that are generally useful in measles, as before observed; and that measles are best managed in some cases by the supporting plan; for instance, Huxham mentions in his work on air and epidemics, the measles as occurring with petechiæ and sudden prostration: The state of the system, it is evident, must do much to determine the nature of the fever, whether typhoid, typhus, or otherwise, and of course the treatment:

* Medical Transactions, vol. iii. p. 396.

it is, therefore, idle to consider the symptoms enumerated generally, under the head of measles, as always indicating a particular treatment; though it may be generally true, that when the thorax, eyes, and the higher degree of redness of the skin, which attends measles may require the antiphlogistic plan more generally than the scarlatina, which is distinguished by a less degree and which occurs most commonly in the autumn, after the depletion produced in the system by the abstraction of heat, when a typhous disposition is more prevalent.

The cough, watery eyes, the eyelids red and swelled, Dr. Heberden says *seldom* fail to attend the measles. We learn, from Withering, that the eyes and nostrils in scarlatina are red; this is produced by the tendency of the blood to the head, as the delirium is high in proportion; besides, the measles, sometimes come on without the above symptoms; The phenomena, occur in various degrees, as before observed; Dr. Rush saw during the prevalence of the scarlet fever, sudden swellings of the eyelids continuing for two or three days; inflammation of the eyes, with sudden swellings of the lips and throat, continuing also about the same time;* Heberden says, "the time, likewise, of the eruption is different in the scarlet fever; it appears both on the face and arms, on the first and second day, but in the measles, it begins only on the third day of the fever to be visible about the chin, and does not come to the arms and hands, till the fourth or fifth day; and does not usually consist as in the measles of distinct spots, with the natural colour of the skin interposed."

The eruption of the measles sometimes appears on the second day of the fever, and disappears on the fourth. In the form described by Dr. Watson, this was generally the case: It does not appear sometimes till the fifth day or later, and then it is protracted to the fifteenth or twentieth, as remarked under the head of measles: The fever of measles has appeared in the typhous form and ended in death without any eruption.† The eruption in the measles does not always begin about the chin, as in the fever mentioned by Sydenham;‡ but on various parts of the body; Dr. Heberden says, that the eruption of the scarlet fever does not usually, as in the measles, consist of distinct spots with the natural colour of the skin interposed; Bateman describes the eruption of the scarlet fever, (simplex,) as being formed of redness, coalescing into small patches, on the second day; on the third, as exhibiting a diffuse redness over the limbs; on the trunk, however, he says the rash is seldom universal, but is distributed in diffuse irregular patches, &c. and when it disappears on the fifth, these patches occur again, with interstices of whiter skin between them: How then are these authors to be reconciled? Heberden speaks of the uniform redness of the skin, as a distinctive trait of scarlet fever; Bateman describes it as beginning and ending in patches, over the whole body, and when at its height on the trunk, never exhibiting this uniform colour; Bateman describes the scarlatina anginosa, as coming out in scattered patches only: Heberden uses the expression the scarlatina does not usually consist of spots, which shows, that he did not rely implicitly on this character: These objections are stated as rendering it probable that these diseases run into each other by degrees, which cannot easily be defined: Dr. Rush mentions a diffused redness, as occurring in the measles of 1789, instead of the eruption; in others, he says it occurred in blotches;§ These distinctions are, therefore, not universal; They may occur frequently; but they cannot be considered as by any means breaking the general position, that these diseases run insensibly into each other, and cannot easily be distinguished in their remote varieties: These remarks will have the full effect intended by the author, if they put the reader on his guard to treat these diseases according to their true character, without respect to their place in the nosology; and not to expect always when the skin is uniformly red to find a typhous disease, nor when it exhibits these gradations of symptoms, which appear under the state of system called measles, to find an inflammatory diathesis: it may be often the case, but it is not by any means always so; There are few records of these diseases; and still fewer of the varieties of their symptoms, and the subject is one which is worthy of investigation.

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* Works, vol. ii. p. 416.

† Ed. Med. and Surgical Journal, p. 123. 1817.

‡ Sydenham, p. 377. Lond. Ed. 1676.

§ Works, p. 427. vol. ii. 1809.

COMMUNICATION BY INOCULATION.

Among the peculiarities of *specific* contagions, communication by inoculation has been mentioned. This however is not a general law. Measles, chicken-pox, and scarlet fever, cannot be given in this way; and the remaining diseases of the class share this property with several other affections,—syphilis, gonorrhœa, psora, and Egyptian ophthalmia. The uniformity in the *latent period* of most of the specific contagions, whether febrile or chronic, deserves some notice in a general view of the pathological relations of the exanthemata. It appears to be often as accurately defined as the periods of the fever, and this by an unknown law of the animal economy. It admits, however, of some variety, though apparently not so great as in the case of *common* contagion. The latent period of typhus for instance, is considered to vary from a week to two months; that of small-pox and plague certainly does not vary more than a few days.

It has been always reckoned a very striking feature in the history of the exanthemata, that they are not compatible with each other, or with any other disorder. In most cases, if another disease be present, the exanthemata will not advance. Thus diarrhœa and fever prevent the success of inoculation. Eruptions on the skin retard and modify the appearances of the vaccine vesicle. Cases have been mentioned, where the small-pox and measles occurring together, the small-pox has been delayed, until the latter has run its course.* This law however is subject to numerous exceptions. It has been proved for instance, that small-pox and measles, as well as cow-pox and measles, may co-exist. Measles and hooping-cough frequently proceed together. In like manner small-pox and cow-pox are sometimes observed to advance, each vesicle preserving its own character. The principle, nevertheless, is an important one; and it may perhaps be illustrated by the well known fact, that during the prevalence of an epidemic plague or yellow fever, (the one notoriously, and the other very probably arising from specific contagion,) all other disorders disappear.

The incompatibility of eruptive fevers as a general principle is true, but the exceptions we frequently meet with, constitute a curious and difficult problem in pathology. We have nevertheless often observed, that the contagion which makes the first impression on the nerves, maintains its ascendance, till it shall have run its ordinary course, either superceding or retarding that which immediately succeeds it. This effect seems to be in the ratio of the distance of time, between the two morbid impressions. It would seem probable, that every specific poison exerts a peculiar influence on some series of organic life, different from every other, and hence the actions they excite may exist, at least separately, if not independently. Eruptive fevers not only suspend other diseases, but eradicate old predispositions. Measles cure pertussis and intermitting fever, which cease at the completion of the eruption. They remove the predisposition to chronic rheumatism and sometimes cure it. They obliterate the predisposition to tracheitis in some children. The same effects may be observed after the small-pox,

* Edin. Med. Comm. vol. iii. p. 443, also vol. i. as quoted by Thomas.

especially when the eruption has been copious: all these things we have observed in our own practice.

The examples of plague and yellow fever adduced by the author, are unfortunate specimens, even viewing it in an analogical light. The fact so long noticed by Diemerbroek is undoubted, but it admits of a rationale the reverse of the hypothesis in the text. It is not the actual existence of the plague or yellow fever in the living body that repels all other causes, because others living in the same place, not exposed to the sick, would be equally as susceptible to any other cause, as they would be in other situations. The explanation is easy. Both the proposed illustrations are derived from an inquinated *atmosphere* in which alone their causes reside. This opinion has been confirmed by hundreds of examples, as it regards the yellow fever, and will be found not less philosophical as it respects the plague. While the plague prevailed with great mortality at Bucharest, in 1816–17, many of the inhabitants sought refuge in the neighbouring mountains; some of them experienced the disease after their removal, but it was not propagated to their household. Neither wives, husbands, children, nor attendants were afflicted with plague. Those who received the remote cause previous to their removal, were the only sufferers. Atmospherical infection is one thing; contagion another. The last is always animal, the other never. P.

CRITICISM ON DR. WILLAN'S ARRANGEMENT OF THE EXANTHEMATA.

In Dr. Willan's arrangement of cutaneous affections, it will be found that the natural connexions of the exanthemata are broken, and these diseases thrown into other pathological relations, to which they do not appear to have any claim. This has been done under an idea that there is some essential difference between a pimple and a rash, a vesicle and a pustule. These I believe to be little more than modifications of each other, and by no means so distinct as to become the foundation of nosological arrangement. The same disease is vesicular at one period, and pustular at another. A slight accident may at any time convert the vesicle into a pustule. Indeed, as a general principle in pathology it may be stated, that the pustular or vesicular character of an eruption depends upon, and is determined by, the quantity of inflammation existing in the cutis, and the degree of strength in the general system. Upon the whole there can be little doubt, that Dr. Cullen's classification of the exanthemata, is pathologically more correct, and in practice more applicable, than that suggested by Dr. Willan; and we shall follow it therefore in the subsequent pages.

THEIR CONNECTION WITH DISEASE OF THE MUCOUS MEMBRANE.

The pathology of the eruptive febrile diseases is confessedly as obscure as that of the simple fevers; but latterly an attempt has been made to clear up some of the difficulties in which it is involved, by showing, that disease of the great mucous membranes of the body is implicated in them, as intimately, and to almost as great an extent, as the skin itself.* The structure and functions of the skin and

* The sympathies seem easier produced in parts similarly organized than in others. The quick current betwixt the skin and intestines is very remarkable, in the effects of diminished perspiration in exciting diarrhœa, dysentery and some other diseases. It seems to be on this principle we may explain many of the

mucous membranes bear a close resemblance to each other, and many pathological considerations tend to prove that there exists also a very close analogy in their diseases. It would be a rational conjecture therefore that in fevers where the skin is extensively concerned, the mucous membranes would participate, and observation favours the opinion. The principle appears to be of very general application, and is illustrated not merely by the symptoms which the different exanthemata present in their different stages, but by the appearances also found after death. There is reason to suspect, that upon this intimate connexion between the exanthematous fevers and disease of the mucous membrane, depend several of the most important varieties and anomalies which have been observed; such, for instance, as the recession of the eruptions, and the occasional recurrence of the disease. As we proceed in the separate examination of the diseases of this order, we shall have frequent occasion to refer to these, as well as to the other general views of the exanthemata which have been taken in this chapter, and which, though avowedly obscure, may yet give us some assistance in explaining their several phenomena.

It is difficult to imagine how the connexion of the mucous membrane with these diseases can throw any light upon their pathology, their varieties, anomalies, or occasional recurrence. The connection of the lining membrane of bowels and the skin, and the disposition of these maladies to affect both these surfaces, has always been acknowledged; the phrase mucous membrane, which fills now the mouth of the profession, discovers to us no new phenomena; they are the same, and no new turn of expression can change them; it is a barren source to look for explanation of what cannot be explained; further than the succession of the phenomena, we observe nothing, nor can know any thing.

It was this last circumstance in natural philosophy which led Newton to the great results which distinguish his life, and not the idle investigations about the intimate and essential nature of causes, as of gravity, &c., which begin in the imagination and end in nothing. The talk about the division of membranes, and the accurate location of certain diseases in them, is the folly of the day; it occupies the place of the lentor and the spasm of the days which are passed, and we believe with as little prospect of advantage in unveiling the secrets of nature. The opinion of Cullen, that the serous membranes are rarely affected without the contiguous structure partaking in the diseased action, is one which the morbid phenomena renders certain after death, as well as the general increased action of the blood-vessels during life, which are in the phlegmasiæ excited not partially but in every part of the body: that the blood-vessels can act more strongly on the surface of a membrane as thin as the peritoneum or pleura, without that action extending beyond it, is unreasonable, particularly as the great power which sets the blood in motion, is increased in its action; how common is it to find even the skin of the surface of the belly in peritoneal inflammation so tender that it cannot be touched; the same is true of inflammations of the chest, and of the head. How common is it to see inflammation of the brain involved in that of the scalp, periosteum, bone, dura mater, pia mater,

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metastasis of fevers. Many affections of the stomach would illustrate this position. The connexion between a diminished cutaneous secretion and the aggravation of dyspeptic symptoms is very remarkable.

with an abscess below, and all the results of a slight blow on the surface of the head but little regarded, ending at last in palsy, epilepsy, &c. So it is with the inflammation of the lungs, liver, &c. The peripneumonia, paraphrenitis, which confined the inflammation solely to the covering membranes of certain organs, have long since been thrown aside, because the organs themselves are seldom found uninflamed when the substance of the viscus is so.

But grant it to be true that inflammations reside only in particular structures in the same attack, the phenomena of measles or small-pox are not better accounted for, because the structures they are supposed to be seated in have the power of secreting mucus or any other substance, or because they line the alimentary canal, or any other structure. The phenomena are still the same as they were in the days of Cullen; the diarrhœa, inflammation of the bronchia in measles, &c. are the same they always have been: their more accurate observation, varieties, and classification, only should occupy us, so that they may be more completely relieved by the discovery of their relations, and of proper remedies. We subjoin a few general remarks upon these diseases, which should have come in at another place.

These diseases all constitute one family; there is some reason to believe that they generally appear about the same time. Withering states that the scarlet fever appeared about the same time with the small-pox, measles, and hooping-cough: the ulcerated sore-throat preceded it. Navier states that scarlet fever succeeded the small-pox; Morton observed the former to prevail with the measles; Sydenham states that the scarlet fever succeeded the measles; also that the measles introduced the small-pox of the years 1670 and of 1674. A variety of erysipelatous fever, which, like the scarlet fever, came on towards the end of summer, appeared with it in one epidemic constitution: this erysipelas was distinguished by great pain and redness of the skin, which was covered with regular rows of very small pimples, resembling somewhat the stings of bees, and ending in vesicles: the fever preceded a day or two. He describes another species, sometimes ending in vesicles resembling the stings of nettles, receding in the form of tubercles in the skin, attended with a most violent and intolerable itching, establishing the affinity between erysipelas and urticaria, as the former species does between scarlatina and erysipelas. In Philadelphia the fever of this year (1828) is distinguished by affections of the skin, urticaria, erysipelas, measles, and varioloid; the two latter, in one case, appeared together: that they are necessarily connected in their appearance, the above few extracts are not advanced as being sufficient to prove; they may, however, lead others to investigate the subject. But the following facts will show that the exanthemata are more intimately united with the diseases of the skin generally than has been commonly imagined.

A former attack of measles is sometimes followed, not by measles, but erysipelas, ending in urticaria,* with the fever and the other symptoms of measles, cough, sore eyes, &c. The variety of affections of the skin, which, during an epidemic, take the place of small-pox, in those formerly attacked, bears very strongly upon this point. Thus, the fever of the small-pox appears in many, and is succeeded by certain eruptions, and the small-pox does not appear. These are a rash resembling the first eruption of the small-pox, spread all over the skin; another with the character of measles; a nettle rash, which ends in erysipelas, with great heat and itching of the skin, all appearing in persons who have already had the small-pox,† and introduced by a fever resembling that of this disease. These facts would seem to show that the local affections of these diseases had something in common with other affections of the skin, and that the structure, like every other part of the body, is susceptible of a certain range of morbid phenomena, connected with fever and without; some of which have a greater and some a less tendency to recur in the same indivi-

* Ed. Med. Essays, vol. v. p. 28.

† Quier's account of the small-pox at Jamaica, p. 77, 78.

dual, but how often, and what circumstances vary this tendency, the science has not as yet thrown sufficient light upon the subject exactly to determine.

Further, it would appear from an examination of the records of mortality made in Glasgow, by Dr. Watts, that the mortality formerly produced by small-pox, is now occasioned by the measles; the small-pox being disarmed of its terrors by vaccination. This is an impressive fact; it shews that there is a certain degree of predisposition to reaction in the skin, which must be exhausted by some of its eruptive diseases.

Huxham asks this question in his book on Air and Epidemic Diseases: "Is there not some peculiar disposition to produce cuticular eruptions? Surely at the same time that the small-pox and pustular fevers are rife, all kinds of eruptions, as the rash, erysipelas, &c. are common, as is very frequently observed; nay, it hath been long and commonly known, even among old women and nurses, that the measles and swine or chicken-pox, are very often harbingers of the small-pox."* The usual records of the occurrence of epidemic diseases are so general that though some of the exanthemata may appear, the minor forms of them may not be noticed: the subject is important and deserves investigation.

This view throws it open to an inquiry very interesting to mankind: What are the various agents which are most favorable to the extinction of this susceptibility in the skin? What are its sources; the air, &c.? It is proved by the foregoing facts, that even small-pox itself does not eradicate completely, only after several inoculations, the disposition to the recurrence of the disease; and after it has worn out its susceptibility for the small-pox for that time, other eruptive diseases appear at the same time with the fever of the prevailing disease of the skin.

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* Huxham on Air and Epidemic Diseases, vol. i. p. 139. 1788.

CHAPTER IX.

OF THE SMALL-POX.

Introduction of the Small-Pox into Europe. Ravages committed by it. Symptoms of the Disease. Distinct and Confluent Small-Pox. Malignant Small-Pox. Coherent Small-Pox. Prognosis. Morbid Appearances. Structure of the Pock. Peculiarities of the Contagion of Small-Pox. Causes of Confluence. General Plan of Treatment. Practice of Inoculation.

It is a commonly received opinion, that the small-pox first appeared in China and Hindostan, and that it was known in those countries from a very remote period. Such an opinion is certainly countenanced by a number of strong arguments and very curious considerations; by the mythology, the religious institutions, the sacred and historical records, the medical works, and the uniform traditions of those countries. In the account of Southern India, however, by Colonel Wilks, an ingenious and plausible attempt has been made to overthrow this long established belief, to prove that the small-pox was first introduced into India in the sixth century, and to reconcile all the foregoing arguments with such a supposition. Without entering into the discussion of a question which has no practical bearing to recommend it, it will be sufficient for my purpose to state, that inoculation was practised in India long before it became general in Europe*; and that we are unquestionably indebted to Asiatic ingenuity for the first efficacious means of combating this formidable disorder.

Whatever opinion may be entertained regarding the antiquity of small-pox in the East, no doubt exists as to the period when it first appeared in the West. This happened in Arabia, somewhere about the æra of the Hegyra, A. D. 622. From this point, as from a centre, the small-pox gradually spread into

* Consult Mr. Moore's very valuable and interesting work, entitled "*History of the Small-Pox.*"

Europe and Asia Minor. It appears to have reached England towards the close of the ninth century.* All authors concur in representing the dreadful mortality occasioned by this pestilence wherever it appeared, and the consequent terror which it every where excited. Never was this more strikingly manifested than early in the sixteenth century, when some of the successors of Columbus carried the disease to America. The record of the desolation that followed in its track, it is painful to contemplate.

The general introduction of inoculation was brought about in 1722, by the acute observation and spirited efforts of Lady Mary Wortley Montague. For a long time, however, the practice was viewed with great distrust, nor were its merits fully appreciated till towards the latter period of the last century. This change in the ideas of the world concerning the value of inoculation,

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* There seems to be good evidence of the existence of small-pox in Europe, and probably in England, long before this period. During the investigations made by Dr. Woodville, he discovered among the manuscripts in the British Museum, as well as in the Cottonian collections written towards the end of the eighth century, the repeated occurrences of the word *variolæ*, and it is there expressly stated, that the inhabitants lived in constant dread of the small-pox. This account is corroborated by the notorious fact that in those collections there are preserved many prayers, exorcisms, and incantations intended to protect the people against variolous contagion.—We have high authority to show that the disease was known in other parts of Europe at a much earlier period. Marius Aventicensis, who was Bishop of Lausanne in the seventh century, though he does not mention the year, uses these words. "*Hoc anno Variolæ cum profluvio ventris, Galliam, Italiamque valde afflixit.*"

It is not generally known that for the successful and ameliorating influence of inoculation for the small-pox we are more indebted to one of the then colonies than to Great Britain herself. We feel a pleasure and a pride in bestowing the due meed of praise upon the state of Massachusetts. Lady Montague's elder daughter had been inoculated at Pera in April, 1717, by Maitland, surgeon to the embassy, and by the same hand her infant daughter, aged three months, was inoculated in London in April, 1721. The elder was the first European inoculated for the small-pox, and the younger the first inoculated in Europe.—In April, 1721, inoculation for the small-pox was introduced into Britain by the Rev. C. Mather, aided by Dr. Boylston. This Rev. gentleman received the suggestion from some ephemeral account he had read of inoculation in the east. He was destined to pass the ordeal of all the ignorance, prejudices and superstition of the times, not only of the populace but the faculty of physic, who were, with the exception of Dr. Boylston, enlisted against the project. A very protracted public controversy ensued, in which the clergy generally united against the physicians and finally so signally triumphed, that inoculation spread through most of the then Colonies; the practice was adopted without opposition long before the dissensions ceased in England. The success of the Rev. Mr. Mather and his able and spirited coadjutor, Dr. Boylston, contributed very essentially to settle public opinion in Great Britain, and to promote the progress of inoculation in other parts of Europe.

The Suttonian practice certainly was not original.

The prophylactic process of mercury first used by the two Taylors of Litchfield gave the first, and only security against the effects of the variolous virus

may be dated from the general adoption of the Suttonian practice in 1766.

For the first description of the small-pox we are indebted to Rhazes, one of the earliest of the Arabian authors, who flourished in the tenth century. The increasing prevalence, and almost incredible malignity of the complaint, rendered it an object of investigation to almost all succeeding authors. Sydenham, in particular, studied the disease with an attention to minutiæ, which can scarcely be paralleled in the history of medicine. In consequence, a mass of facts has been collected together concerning the small-pox, which does not admit of being detailed in the compass of an elementary work; nor, under present circumstances, does it appear necessary to devote to it that degree of attention which it received in earlier times. I shall content myself, therefore, with an attempt to give a general notion of the effects of the variolous poison upon the animal economy. I shall then point out how far they admit of being moderated; and conclude with a few remarks on the modification which small-pox undergoes from the mode of its reception into the system.

Symptoms of the Disease.—The contagion of small-pox has a latent period of from ten to fourteen days, at the end of which time it begins to show its deleterious effects upon the system. These vary both in *kind* and in *degree;* and attempts have been made to ascertain, if possible, the sources of the different forms which small-pox assumes. By some, the mildness or malignity of the disease have been attributed to differences in the *contagion* from which it emanated. Innumerable facts, however, are upon record disproving this notion, and showing that the severest kind of small-pox may be taken from a case of the mildest sort. That other circumstances concur, I shall hereafter point out; but the student should remember, that the great principle is *idiosyncracy*, or peculiarity of habit. As there are certain constitutions that suffer more than others from lead, mercury, and the venereal poison, so are certain systems unusually irritable under the operation of the variolous virus. Many children suffer in this manner; and consequently an epileptic fit is, in early life, a frequent symptom of the accession of small-pox. It was very justly remarked, however, by Sydenham, that this does not necessarily denote, in them, a severe disease. The case is different when head symptoms accompany the attack of small-pox in more advanced life, and in robust habits. Early delirium, occurring under such circumstances, marks a deep implication of the brain and nervous system, from which, in the progress of the disorder, much is to be dreaded.

The condition of the body that renders it so susceptible of the action of the virus is certainly not peculiar, but owing to the exquisite sensibility of the nerves to all poisons. For this reason it becomes necessary to reduce the

power of life, and thus diminish this susceptibility, before we can ensure a mild disease. It cannot depend upon a peculiar irritability, because if we propose any given number of persons we guarantee them against the eruption in full form, and on the contrary there are very few who will not suffer an aggravated disease, without some reduction of the general system.

There seems to be a difference between the convulsions of children in the eruptive fever of small-pox, and epilepsy. The one is temporary, and never recurs unless in children hereditarily predisposed. The other will be again excited by many causes, and generally continues through life. P.

Instead of the epileptic paroxysm, sometimes children are attacked with cramps in the legs, grinding of the teeth, coma, convulsive twitchings of the jaw, a pain in the back, with an exacerbation of fever: the eruption is generally copious, after coma and cramps of the legs.*

Distinct and Confluent Small-pox.—The eruptive fever of small-pox lasts in general forty-eight hours, and is, in very many cases, not to be distinguished from an attack of inflammatory, or of common continued fever. The suddenness of the seizure is the best guide; but the severe pain of the back, the vomiting, and pain of the epigastrium on pressure, assist in the diagnosis.† The nature of the disease is put beyond a doubt by the eruption, which is first observed about the forehead and wrists, and extending gradually over the other parts of the body, is usually completed in twenty-four, or at farthest in thirty-six hours. On the appearance of eruption, the febrile symptoms abate, and in very mild cases are never renewed. In the severer kinds of small-pox, they only experience at this period a slight remission.

The further progress of the disease depends so much on the *quantity* of the eruption, that nosologists have assumed this as a basis of distinction, and accordingly divide small-pox into two species; the *distinct* and the *confluent*. This arrangement, however, does not seem to me sufficient for practical purposes; and I therefore prefer a fourfold division, into the *distinct*, the *simple confluent*, the *malignant confluent*, and the *coherent*. The peculiarities in each of these forms of the disease I shall now shortly advert to: premising that, in all, the disease divides itself into three stages; the first terminating by the appearance of the eruption; the second by the maturation of the pustules; and the third by the falling off of the scabs.

1. The distinct small-pox shows itself in the form of elevated

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* Philip, p. 377, vol. i.

† This does not distinguish it from several other diseases. Measles and scarlatina as well as bilious remitting fever all manifest a like sensibility to pressure of the same part. The only distinction between small-pox and these diseases previous to the appearance of the eruption is derived from the peculiar fetor respired from the lungs, which cannot be defined by words, but which can never fail to be recognized by the olfactory nerves of any one who has smelt it. It bears some analogy to that of measles, but can be distinguished by those who have experienced both. P.

papulæ. On the third day a small vesicle, having a *central* depression, may be observed on the summit of each pimple. It contains, at this period, a minute portion of a thin transparent lymph. An inflamed margin, or *areola*, now forms around it; which, when the vesicles are tolerably numerous, diffuses considerable inflammation over the neighboring skin, so as to give it a damask rose colour, and as the eruption advances, to occasion swelling of the face. About the sixth day the vesicles lose their central depression, and assume a spheroidal form. Suppuration has now taken place, and the pustules will be found to contain a thick matter of a yellowish colour. On the succeeding day, those which first appeared upon the face burst, and upon the eighth from the date of the eruption, scabbing commences over the body generally. The swelling of the face then subsides, and all fever is at an end. In about ten days more the crusts fall off; and the skin, though left for a time of a dark brown colour, is ultimately restored to its natural condition.

Such is the usual course of the eruption of distinct small-pox, but it is subject to considerable variety. Upon the face it is sometimes more rapid, while upon the extremities it is commonly more tardy, the pustules on the feet and legs being seldom fully ripened until the tenth or eleventh day from their first appearance. Their contents too vary in point of consistence, and hence have arisen those distinctions of vesicular, vesiculo-pustular, crystalline, horny, and water-pocks, which have been noticed by authors.

The crystalline variety is more frequently attended with coma, delirium, and other symptoms of typhus: at first the eruption looks as well as usual, of a good colour and distinct; about the third day they become irregular in their shape; the urine remains limpid throughout the disease, the matter is colourless, and rarely purulent: the pustules soon become pale on first coming out, the interstices being flaccid, evincing the typhus character of the disease: the period at which the head swells is more uncertain than in the regular variety; the swelling is often suddenly translated to the feet, when no salivation takes place;* if the fever is high, the eruption becomes confluent, and soon after malignant typhous symptoms appear: sometimes instead of the swelling, inflammation takes place in the eyes, lips, throat, or brain, followed by abscesses.† When the patient is debilitated the pustules do not appear, or if they do, they do not ripen; the fever is not developed and the patient dies of coma in a few days:

In the ichorous variety of the disease, the fluid of the pock is transparent in consequence of imperfect suppuration, and when it dries, it exhibits a horny appearance: this is particularly the case among persons of a fair complexion, and in proportion to the darkness of the colour of the skin, the pustules become brown, on drying: In the vesicular variety vesicles appear in the intervals between the pocks.‡

2. When the papulæ are very numerous, and exceedingly

* Philip, p. 387, vol. i † Ibid, p. 388. ‡ Ibid.

close set upon all parts of the body, more especially on the face, we call the disease *confluent*. For the first day or two no differences are perceptible between this and the preceding species, except that the patient is more languid and oppressed; on the third, however, still more upon the fourth, the change becomes apparent. The vesicles on the face run together into one continuous bleb, which, instead of a thick yellow pus, contains a thin brownish ichor. The face looks pale and doughy. On the trunk and extremities, the vesicles, although not actually *confluent*, are without areola, pale and flaccid. When the pustules break, extensive black or brown scabs are formed, attended with intolerable *fœtor*. At this period, the febrile symptoms undergo a remarkable exacerbation, constituting what is called *Secondary Fever*. But the mischief does not rest here. The violent action which has taken place in the skin, not having come to its natural *crisis*, is kept up. Ulceration of the cutis vera goes on beneath the scabs, and, if the patient survives, occasions pits and scars. In other cases, boils, abscesses, tedious ulcerations of the legs, and inflammation of the eyes, harass the patient, wear out his strength, and perhaps ultimately destroy him.

Hitherto I have chiefly directed my attention to the effects of the variolous poison upon the skin; but it is further to be remarked, that in some cases of distinct small-pox, and in almost all cases of the confluent variety, the mucous membrane of the mouth, larynx, and trachea is occupied by a peculiar eruption, which follows a regular course, and has a most material influence on the progress of the disorder. Though present in a greater or less degree in all severe cases, it is by no means in exact correspondence with the quantity of eruption on the skin. The extent of vesicles upon the tongue, indeed, constitutes the only true index of the degree to which the trachea is affected. The symptoms to which it gives rise, are hoarseness, difficulty of swallowing, an increased secretion of saliva, cough, copious and viscid expectoration, and dyspnœa. In many cases of severe confluent small-pox, these symptoms are of the utmost importance, and absorb the whole attention of the patient.

Sydenham tells us, that the spitting sometimes begins as soon as the eruptions appear, and sometimes not till a day or two after; it resembles the salivation by mercury; towards the eleventh day it becomes viscous, is raised with difficulty, the patient is thirsty, coughs often while he drinks, discharging the liquor from the nostrils, the salivation stopping entirely, or recurring after a day or two; sometimes the swelling of the face abates, and recedes into the hands; which is sometimes favoured by the application of hot water, or poultices.* The diarrhœa in children does not appear so soon as the salivation in adults, though when it does begin, it continues throughout the disease.

* Rush, note to p. 77 of Sydenham.

3. *Malignant Small-pox.*—Such are the phenomena of *simple confluence.* The student may imagine in how great a degree its dangers are aggravated, when to them are superadded the symptoms of malignancy and putrescency. Of these, one has been already mentioned, viz. early fierce delirium. The remaining are, hæmorrhage from the stomach, bowels, or uterus, petechial vesicles, gangrene of the extremities, purulent ophthalmia, diffuse cellular inflammation, and erysipelas. These cases sometimes prove fatal as early as the fifth, and seldom survive beyond the tenth day of the disease (the eighth of eruption).

4. *Coherent Small-pox.*—It must be obvious, that in nature there can be no exact line of separation between the distinct and confluent kinds of small-pox. They run into each other by insensible degrees. Now to those cases which are intermediate between the perfectly distinct and confluent, we give the name of *coherent*, or *semi-confluent.* This term applies, first, to cases where the eruption is *uniform*, but where the papulæ are not sufficiently numerous to coalesce before the fifth or sixth day; and, secondly, to those where the eruption is *in patches*, confluent in one part, and distinct in another.

The appearances on dissection in those who die of small-pox are confined, as far as my observation extends, to the mucous membrane of the trachea and the pluera. I have never been able to trace any morbid appearances in the head, even where cerebral affection was most decisively marked during life; and the abdominal viscera appear to be singularly exempt, under all circumstances, from the influence of the variolous virus. No vestiges of pustules have been ever traced at the Small-pox Hospital in the cavity of the abdomen.

When small-pox proves fatal about the tenth day, it is common to find evidences of active inflammation in the larynx and trachea. A copious, dark-coloured, and viscid secretion (quite peculiar to this complaint) lines their inner membrane, which is highly vascular. At a later period of the disease, one cavity of the thorax is occasionally found loaded with purulent effusion, the pleura having become implicated in the course of the disease. The substance of the lungs is then consolidated by the pressure of the effused fluid. Variolous pleurisy (as it may be called) is rare, and by no means well marked in any of its stages.

Prognosis.—The prognosis in small-pox is regulated almost entirely by the form which the disease assumes; but of course the strength of the patient's constitution is, to a certain extent, to be taken into account. Distinct small-pox is a disease of little or no danger; while the confluent variety is attended, even under circumstances comparatively favourable, with imminent hazard to life.* When malignancy and confluence are associa-

* The danger of the disease is known by its state upon the face; if con-

ted, the case is utterly hopeless. The mortality in small-pox simply confluent is about three in five. Coherent cases prove fatal in the proportion of about one in four. Upon the whole, it is computed, that of every six persons who receive small-pox in the natural way, one dies. The most unfavourable symptoms are those which indicate affection of the brain, larynx, and bronchia, violence of fever, and strong determination of blood to the skin. The most favourable are, quiet of mind, a tongue free from vesicles, swelling of the face, but above all a small, soft, and yielding pulse. From the tenth to the thirteenth day is the period of the greatest danger; but to feeble constitutions, and especially to scrofulous children, the sequelæ of the disease are scarcely less formidable than the violence of its crisis.

Before proceeding to the method of treatment in small-pox, I may notice a few circumstances connected with the disease, which are either objects of pathological curiosity, or of interest, as suggesting the means of lessening its violence.

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fluent on the forehead, and more particularly at the roots of the hair or on the face, and if the pox run into each other so as to make it appear as if it were covered with parchment, the danger is considerable, whatever may be its appearance on other parts: sometimes the matter of the pustules oozes out and leaves the vesicles empty (siliquosa;) if, then, on the patient's walking out, on the use of the cold bath or tonics, they fill with a proper matter, it is always a good sign:* the later the eruption the more favourable is the case; as is also the damask colour of the skin between the pustules: the swelling of the face in mild cases, when slight, is favourable; when in excess, the contrary: If the stools are unusually fœtid in the confluent kind, it is a bad omen; the higher coloured the matter is, the more favourable is it in this variety; when it is black or sanious, it is extremely dangerous.†

Sydenham says, that if the patient sweats freely, in the beginning of the disease, and if he promote it by cordials and hot regimen, and the face in consequence towards the eighth day becomes flaccid, white or pale between the pocks, whilst they look red and continue elevated, the sweat at the same time ceasing, without the possibility of raising it again by any means, then delirium, frequent voiding of urine in small quantities, great restlessness and sickness, attend upon these symptoms, and usher in the death of the patient. In cold weather, in old persons, or if bleeding has been used, then a hot and cordial regimen does not so certainly hinder the swelling of the face, and is not so fatal as where the eruptions are many, or when the disease happens in the spring, the patient is in the prime of life, and no blood has been taken away:

If the spitting in the confluent kind, which generally ceases about the eleventh day, is not assisted in its good effects by the continuance of the swelling of the face, and of the hands, which last begins about this time, death generally follows. From the effect of the hot regimen when the system is inflammatory, debility is produced to so great a degree that the swelling of the hands vanishes with the salivation, when it should continue increasing for a day or two (a most favourable sign,) as the salivation disappears. When the saliva, from being thin and ichorous, and easily expectorated, becomes thick and viscid, falls down into the wind-pipe, threatens suffocation, and is thrown up into the nostrils, it is unfavourable; the patient shortly after is often seized with a hoarseness, stupor, drowsiness, and soon dies.

* Philip, pp. 373. 380, vol. i. † Ibid.

Structure of the pock.—The seat and structure of the pock has been a frequent subject of inquiry, and by some is supposed to be still involved in obscurity. The *rete mocosum* appears to be the true seat of the small-pox pustule, but the inflammation sometimes dips down into the cutis vera. The pock, when minutely examined, exhibits in its early stages a cellular structure, the walls of which are perfectly transparent, and appear to secrete the fluid which distends them. At the bottom of each pock, a small slough of the cutis may be observed from the fifth to the eighth day, of a circular form, and about the thickness of writing paper. By several eminent pathologists, this slough is considered the certain test of small-pox, and to be owing, not so much to the intensity, as to the peculiar *kind* of the inflammation.

Peculiarities of the contagion of Small-pox.—The disposition to receive small-pox is so general throughout the human race, that few persons are met with who resist it during their whole lives, when fully exposed to its influence. All ages are alike susceptible of it. It is communicable by the mother to the fœtus in utero, but under such circumstances it has almost invariably proved fatal to the child. There is even reason to believe that a mother who has already passed through the disease may communicate it to the fœtus.

Unborn children do not always take the small-pox from their mothers labouring under this disease; and mothers have passed through the disease by inoculation, and children of whom they were pregnant at the same time have afterwards been inoculated and have taken the disease.* In some cases, however, children are born with pustules upon them, which they must have taken from the mother, who had the disease; but in other instances, the child has been born with the eruption of the small-pox upon it, though there was no appearance of the disease in the mother. It is the opinion of Underwood that very young children, from a month old to a year, contrary to what the author has stated, are not so susceptible of it.

With regard to the distance at which it is communicable, Dr. O'Ryan of Lyons, has proved by putting dossils of lint and silk strongly impregnated with variolous matter in the centre of an oval table, the least diameter of which was three feet, and by exposing children to it every morning and evening for a week, sometimes in the open air and sometimes in a room, that they remained free from the disease. He also proved that children who took the small-pox afterwards by inoculation, were not susceptible of it though placed within two feet of a child for the space of one hour daily for a fortnight;† patients in general, therefore, must approach nearer, in order to receive the disease. Much must depend upon the purity of the air, the mass of contagious matter, as well as the susceptibility of the system. C.

The deleterious effects of the small-pox virus upon the gravid uterus are very remarkable. It seldom fails to occasion abortion, especially in the early months of pregnancy. In general, one at-

* Good, vol. ii. p. 416, quoting Sir Geo. Baker. See cases in the Medico-Chirurgical Trans. London, Vol. i. p. 271, by Jenner; also Quier's account of small-pox at Jamaica, p. 103.

† Bateman's succinct account, p. 147. Lond. 1818.

tack of the small-pox secures the system from the disease for ever after. Yet some exceptions to this law have been met with. Unequivocal cases of what is called *secondary* small-pox are recorded in the writings of authors, as having occurred in all ages and countries; and the second attack, though generally mild, and modified, has proved in some instances severer than the primary. Even fatal cases of secondary small-pox have been recorded by authors of undoubted veracity.

Causes of Confluence.—I have already remarked, that the comparative mildness or violence of the disease depends principally upon some peculiar susceptibility of the system to the variolous poison; but some other circumstances concur. Delicacy in the structure of the skin is probably concerned in the phenomenon; for in this way only can we account for the greater disposition to confluence upon the face than on other parts. The rete mucosum is there loaded with vessels, which have manifestly a greater disposition than common to receive red blood. Further, whatever encourages the blood to the surface of the body has a tendency to produce confluence. Hence it is that a long succession of close and moist weather, exposure to great heat (as in the trade of the sugar baker), the free use of ardent spirits, diaphoretic medicines, the warm bath, and stimuli applied to the skin, aggravate the disease in a high degree; while cold and frost, and light clothing, and the antiphlogistic regimen, tend greatly to lessen its severity.

Treatment.—The general principles of treatment in small-pox were for a long time misunderstood, and measures were consequently adopted which greatly increased the mortality of the disease. In the distinct small-pox very little is requisite; and the danger in confluent cases is urgent under any system of management; yet the advantages of a well-regulated treatment are as obvious in small-pox as in any other disease.

During the eruptive stage the object is to moderate inflammatory excitement generally, and to lessen the quantity of eruption. For this purpose the patient is to be freely exposed to a cool atmosphere, and the strictest antiphlogistic regimen is to be pursued. Great diversities of opinion have prevailed regarding the propriety of blood-letting in this and the other stages of small-pox. There is no reason to believe that it lessens the *number* of pustules; and it has been supposed to impair that strength of the body which is indispensable throughout the latter stages of the disease, when extreme weakness so often exists with extensive ulceration and gangrene. In forming a judgment however on this point, it is necessary to bear in mind, that these symptoms, though they sometimes arise from real debility of the powers of life, yet are often attributable to excessive inflammation of the skin, which might have been prevented by a

judicious employment of the lancet. It is to be remembered also, that in small-pox, fully as much as in any other form of fever, there is a tendency to congestions and inflammations in the head and thorax. These must be treated upon the same principles as have been already urged with regard to fever generally.

We cannot here too much insist upon the idea, that small-pox, like other fevers, is typhous, typhoid, and inflammatory in its type. When it attacks a person of a high phlogistic temperament and robust constitution, all the means before recommended are necessary: when typhous, those advised under that head. Huxham describes it as occurring with a low, weak, and fluttering pulse, giddiness, heaviness, nausea, and puking, weakness and weariness from the beginning, as in typhus, and these symptoms continuing for seven or eight days before the eruption appeared; petechiæ, hæmorrhagies, black pustules also attend it, and, as he states, the hot and cold regimen, bleeding and stimulants are proper according to the nature of the disease; this rule applies also to the preparation: in a typhous epidemic small-pox, the system should be supported and not depleted.

Attention should be paid therefore to the concomitant symptoms, and the character of the pulse; and where there is evidence of local determination, it must be obviated, according to its urgency, by *local or general bleeding*, at any period of the disease, without reference to the affection of the skin. Occasional purging and the usual antiphlogistic treatment are advisable during the whole period of febrile excitement.

I. The signs by which bleeding is shown to be expedient, are when delirium is present, and in the distinct kind, when the eruptions are numerous and the face does not swell, and when by improper stimulants the system has been too much excited; and exposure to the air, bleeding, and cold drinks have then a fine effect:

Bleeding and occasional purging are also necessary, after the patient has begun to go about and returned to his usual regimen, to prevent local inflammations; as biles, chronic inflammations of the eyes, lungs, &c., and swelling of the legs; fomentations are also useful in this last symptom.*

An emetic given at the time of the appearance of the small-pox, particularly when they threaten to be confluent, has a most excellent effect; also, when from a typhous state of the system, they remain long buried in the skin without appearing, it is very useful; particularly if assisted by enemata and gentle cathartics, it produces fœtid discharges which keep up the typhous state.

II. A salivation is said by Sir Geo. Baker to render the small-pox milder in those who take the disease when in this state:† Calomel is also said to have the same favourable effect when given as a purgative.

III. The patient should drink freely of acid and cold drinks; use the cold affusion, when the skin is hot and dry; expose himself to the air as much as possible, and if there are convulsions, laudanum may be given to abate them; four drops to a child of a year old, eight drops to one of two, &c. If the fits are moderate, cool air only is necessary. The use of the cold affusion lessens the fever and the number of the eruptions, and thus prevents the disease from being confluent: The air of the room should be completely cool, avoiding, however, a reduction of temperature, sufficient to produce chilliness: The patient

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* Sydenham, Rush's, p. 91–95. † Sims on Epidemics, p. 42. 1773.

should lie on a matrass, to attain this end more completely; the room should be large and airy; the bed linen must often be changed: We must, however, take care that the depletion be moderate, and cautious, otherwise the patient may fall into typhus; the same remark applies to the use of purgatives.

Dr. Rush tells us, that the Indians plunge themselves into cold water as soon as they perceive the eruption of the small-pox: It is practised by Europeans in hot countries, and with success where the pustules have a flaccid appearance.*

In the confluent variety, however, it is necessary to be very cautious how cold air is applied, as syncope and convulsions sometimes follow it: these occur about the period of maturation most generally; and more particularly if the patient has been debilitated by the hot regimen or other improper treatment: Any debilitating cause, however, will produce the same effect: In the crystalline variety, which tends rapidly to typhus, it is not useful.†

Local bleeding is valuable, where there is coma or inflammation of the eyes; also where there is great pain in the head, with throbbing of the temples and other symptoms of phrenitis.‡ The same remark applies to any other local inflammation.

IV. Purgatives are useful in proportion to the severity of the disease; if, owing to weakness, in cases where there is no evacuation but that from the salivary glands, their suspension becomes necessary, the patient, according to Professor Walker, must be considered as desperate: However, even the cases in which the gangrenous blisters occur, considered as mortal by Sydenham, have been cured by the use of these remedies: in general, though the symptoms of typhus have come on, they are indispensable, regulating their use by the state of the strength; if the patient sinks, of course they are to be discontinued.

V. During the exacerbation, the use of antimonials with nitre will alleviate the symptoms; also saline and effervescing draughts, cream of tartar water, and lemonade: To allay the inflammation of the throat, gargles will be proper, as also the inhalation of the vapour of warm water or vinegar.

VI. The following facts show the value of this depletory practice, and the danger of the contrary: the use of stimulants early in the disease, before the eruption or the typhous symptoms have appeared in robust and young people, where there is great fever, converts a case, which would otherwise have been distinct, into the confluent kind, and the pustules, instead of coming out clearly, are concealed in the skin and do not rise above it.§ Early confinement, in the opinion of Sydenham, produces, from the heat of the bed, bloody urine, purple spots, and other mortal symptoms, particularly in young persons, and in the first stage of the disease.

When the vesicles do not rise, or are filled only with a bloody serum, and when the pulse is weak, the skin purple, marking a failure of the vis vitæ, the tone of the system is to be supported by wine, brandy, bark, camphor, and aromatics, with the occasional exhibition of laxatives.

I. The symptoms of debility may supervene, either on the eruptive or on the secondary fever: When the eruption is distinct, it never is followed by this fever in any considerable degree.‖ Bark in cases in which debility appears, is one of the best tonics; under its use, the pustules fill with good matter, and the petechiæ disappear. Sometimes, great dejection of spirits and fear even in the robust produce typhous symptoms; then if great, stimulants, as wine whey, volatile alkali become necessary: Sometimes bleeding from the arm raises the pulse in a depressed state from this cause in robust people: Judgment only can decide from the circumstances, when this case occurs.

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* Philip, p. 408, vol. i. † Ibid. p. 409. ‡ Ibid. p. 406. § Sydenham.
‖ Philip. 412 vol. i.

When the pustules are bloody, alum mixed with bark, has a good effect; the sulphuric acid has also been used with advantage: Dr. Wright recommends a mixture of a vegetable acid with common salt in the low typhous stage.* Huxham recommends nutritive diet, wine, &c., the mineral acids, with bark, in the confluent kind with petechiæ, when the pox are small and black, and the matter fetid and sanious; in the ichorous variety in which the matter is watery, neither the vegetable nor the mineral acids do any good. In this last kind, the matter forms large vesications filled with water, which at length break and discharge, and leave almost the whole surface excoriated; an atrophy succeeds from the great discharge, or the matter is absorbed, when the pustules do not break, and epilepsy, delirium and syncope are the results: A natural diarrhœa in this case is favorable, as also copious sweats and lateritious urine: Camphor, opium, wine whey, volatile alkali are useful in bringing out the pustules in this variety: coffee also drunk through the whole course of the disease has a good effect:† Blisters are also useful, and opening the bladders with a lancet: Sometimes, a proper union of diuretics, as, nitre, spiritus nitri dulcis, with stimulants, has a fine effect: The sick should be raised to their knees frequently, as it induces them to make water, when if they are left to lie upon their backs they will not think of it.‡

II. Dyspnœa, sneezing, and cough, from the larynx, trachea, &c. being covered by pustules, or from a swelling of the fauces, are relieved by large blisters, applied externally to the throat and back of the neck. If they arise from viscidity of saliva, a gargle of oxymel of squills and water and the application of sinapisms to the hands and feet, with gentle laxatives, are proper; syringing the fauces is also useful. Cyder and honey; vinegar and honey; honey and water; oxymel scilliticum, with borax or nitre; will make excellent preparations for this purpose. Sometimes the mucus becomes tenacious from not drinking freely during the illness, which should be regarded as of primary importance:§ The diet should be entirely liquid: In the black confluent small-pox, solids cannot be swallowed; wine whey, wine and water, barley water with wine, &c., should then form the drinks.

If the difficulty of breathing be great, give the tartarized antimony,‖ or according to Brocklesby, small doses of the ipecacuanha: Full vomiting also alleviates this symptom, as also the stupor and suffocation, which depend upon the viscidity of the saliva, and which are removed with it. The sudden suppression of the salivation is often produced by the supravention of pneumonia.

Where, on the other hand, the salivation is so copious, that suffocation is threatened by the falling of the mucus into the trachea during coma, cathartics are praised by Vogel as the most successful plan.

When the skin is completely covered with one general scab and the salivation ceases, it must be renewed if possible, and a free diuresis is also to be promoted: Both often fail suddenly: Blisters to the ancles; laxative clysters; expectorants, as squills, lac ammoniac should then be used.

III. In the confluent kind, the diarrhœa, which is often troublesome, particularly in children, should not be stopped; if very excessive, it may be moderated by either kino, extract of logwood, catechu, or alum, given in the dose of ten grains in a little cinnamon water, every three or four hours: This, however, must be done cautiously, and if it produce any bad effect, the looseness must be reproduced by laxatives.¶

Sydenham tells us, that a looseness and sinking of the pustules, in the distinct kind, are dangerous symptoms and are often brought on by cold, or too considerable evacuations: In the confluent kind, these symptoms, particularly diarrhœa in children, do not indicate danger: on the contrary, they are part of the disease; Stimulants are then valuable: Pain in the heart and sickness of the stomach, also, shew their necessity.

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* Huxham, vol. i. p. 148. Lond. 1788. † Ibid. 150. ‡ Huxham. § Huxham, p. 161. ‖ Philip, p. 413. vol. i. ¶ Ibid. p. 414. vol. i.

IV. When excessive perspiration threatens debility, the patient should be exposed to the cool air, and be out of bed as much as possible.* Vomiting may be relieved by diluents, as toast and water, chicken water, twenty grains of salt of tartar taken with a table spoonful of vinegar, or a tea spoonful of lemon juice, with four or five drops of laudanum in each dose; mint water, cinnamon water, spirits of turpentine, ten or twenty drops every hour, are also useful: If the matter ejected be acid, alkalies will be proper absorbents; as, chalk, and magnesia: bitters; as, quassia; the extract of cascarilla will often have a very fine effect: A blister to the pit of the stomach, also succeeds.† If heat, headache, sickness and load at the stomach, with great restlessness or stupor come on about the sixth or eighth day from the eruption, the body being costive, or attended with tenesmus, glysters are necessary:

V. Strangury, often, is troublesome in persons who are vigorous and accustomed to make a free use of spirituous liquours; neglect of evacuations, early in the disease, also, produces it: Salt of amber is recommended by Dr. Cameron; it would appear to suit best the low states of disease, when the skin is cold and the arteries debilitated: When the pulse is high and the skin hot, exposure to the cold air, dashing water on the legs, walking about the floor in a loose dress will have a good effect; care, however, must be taken to avoid the use of this remedy when the system is in danger of falling below par: If there is merely difficulty of making water, small doses of camphor and opium given at short intervals will relieve it.‡

VI. When epileptic fits are frequent and threaten death, the warm bath and opium administered, either by the mouth or by injection, generally succeed: They produce perspiration and prevent the return of the fit; Dover's powder has the same effect: Cataplasms applied to the feet do good: Laxatives are also necessary.§

VII. The application of some warm milk or mild ointment is necessary to keep the eyelids from adhering together; and if the eyes are inflamed, an eye water, composed of 10 grs. of the acetate of lead to 6 oz. of water; or of ℈ii of alum to ℥ oz. of water, will alleviate the inflammation, and prevent the pustules from appearing on the cornea.

VIII. The application of lead water will prevent the appearance of the pustules, and if they are numerous on the face, sinapisms to the ancles, with immersion of the feet in warm water, will be proper to lessen the determination to the head.‖

IX. Sudden cold applied to the surface often produces, particularly about the period of maturation, a subsidence of the swelling of the hands and feet, and a retrocession of the eruption, especially if the patient be much debilitated; the same effect is, also, caused by the excessive use of a hot regimen; by too much exertion, as in sitting up; by syncope; by strong emotions, as, terror, grief, by profuse evacuations; in fine, by any cause which debilitates excessively: Wine, opium, and bark succeed best in relieving these symptoms, more particularly when they are produced by excessive evacuations: When they proceed from cold, the warm bath, sinapisms and blisters are proper: When they are the result of a hot regimen, cool air, cold diluents and bleeding are the remedies. Ammonia, blisters to the feet, and the semicupium are recommended by Vogel.¶ Blisters to the wrists will be found to be very valuable on the retrocession of the swelling of the face, provided that of the hands does not recede at the same time: Dr. Cameron recommends wrapping the arms and legs in the citrine ointment, which stimulates the pustules to the secretion of pus, as far as the ointment extends, and relieves the patient immediately from this most dangerous state: Anointing the whole body with mercurial ointment is sometimes useful; some ointment, as, the citrine, however, is better, as it produces an immediate change in the state of the skin: The necessity of these measures

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*Philip, vol. i. p. 415. † Ibid. p. 414. ‡ Ibid. p. 416. § Ibid. 417. ‖ Ibid. ¶ Ibid. p. 418-19.

may be inferred from the debilitated state of the patient, as the recession of the eruption is generally a consequence of it:

X. Tissot recommends the warm bath to the feet when the swelling of the face is excessive.*

XI. Sometimes the eruption is delayed beyond the time of its proper appearrance; then venesection, employed, however, with the utmost caution, a dose of laudanum, and the tepid bath promote its reappearance:

XII. When the pustules appear in the nares and obstruct them, injections are recommended to separate them: when they are longer drying than usual, opening them is very useful; and if the scabs adhere too long, fomentations are the best means to produce their separation: In case of hemorrhagies, the serum aluminosum is recommended to stop them; it is to be applied to the parts from which they proceed, as the mouth, nose, &c. With regard to the various modes of preventing pitting by applying mild ointments to the surface, it is doubtful whether they have any effect; and as children are born pitted with the small-pox, it is certain that the contact of air is not the cause.†

XIII. Sometimes the matter produces fever and death by being confined beneath the cuticle of the soles of the feet of working people. This happened to Quier in Jamaica: It is attended with severe fever, restlessness, and delirium, with violent pains on touching their feet: The cuticle was removed, and poultices applied to the sole, which removed all uneasiness. c.

When the pustules are nearly maturated, and throughout the latter stages of the disease generally, great benefit is experienced from *opiates*, in relieving the irritation of the skin and procuring sleep.

I. In the confluent variety it is necessary to prevent the recession of the pustules; by keeping up the salivation, by small doses of laudanum, small beer, wine whey, &c.; in children opiates are hurtful, when they stop the diarrhœa, which is a substitute for the salivation in adults; these medicines, to persons above fourteen, are useful,‡ by promoting sleep, and keeping up the salivation and the swelling of the hands and feet: Sydenham directs about fourteen drops of laudanum to be given every night after the eruption is over, to the end of the disease. It has a better effect if given earlier in the evening to prevent the fever.

II. Sydenham further tells us, that opiates are indicated in other instances: When, in the distinct small-pox, by a hot regimen and continual sweats, the face does not swell on the eighth day, but is flaccid and the spaces between the eruption are pale, a dose of laudanum has the happiest effect.

III. When a hot and stimulating regimen has produced delirium, great sickness, suppression of urine, free exposure to the open air, copious venesection, or the administration of opiates is the only plan: The return of the swelling of the face is the first evidence of their useful effects:

Venesection is also useful when the pulse is full and strong, and the symptoms inflammatory at the time of the appearance of the secondary fever: The blood is often as much cupped and buffy as in pleurisy: If, on the contrary, the pulse flags, the skin is shrivelled and pale, sunk or livid, the limbs cold, then stimulants are absolutely necessary:§ Blisters to the ancles and wrists; warm and strong wine whey, volatile alkali, &c. c.

There is a remarkable resemblance in the symptoms of the latter stages of small-pox to those of extensive burns and scalds,

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* Philip, vol. i. p. 420. † Ibid. 421–422. vol. i. ‡ Sydenham.
§ Huxham, p. 158. London 1788.

where the good effects of opium are well ascertained. While the scabs are separating, a cordial plan of treatment is often necessary, but it is requisite also in many cases, to look to, and counteract by laxatives and a proper diet, the tendency to local inflammation, which may continue even to the very latest period of the disease.

Considerable difficulty has always been experienced in the management of the many severe sequelæ of confluent and coherent small-pox; but to meet these cases no express rules can be laid down. When the constitution is much enfeebled, and scrofula brought into action, tonics are of some service; and I have derived considerable benefit from the decoction of sarsaparilla. A generous diet, with an allowance of wine or porter, should be permitted; but change of air is the measure of most decided efficacy. The disposition to boils cannot, I believe, be counteracted by any medicinal treatment.

INOCULATION.

When the matter of small-pox is inserted under the skin, a pimple appears on the third day, followed by swelling in the axilla. The pimple then becomes surrounded by a jagged areola, in which small vesications are observable. On the seventh or at farthest the eighth day from the insertion of the virus, rigors occur, and in forty-eight hours afterwards the eruption appears.* In a large majority of cases, the eruption proves to be of the *mild* and *distinct* sort; and in very many instances the number of pustules over the whole body does not exceed one hundred. The further progress of the disorder differs in no respect from that of the distinct *casual* small-pox as already described.

The manner of performing the operation of inoculation is by the insertion of a little of the matter made nearly fluid under the skin, with the point of a lancet, or a needle, making a wound which will draw a single drop of blood, and suffering it to dry completely: A slight itching with a minute pimple appears in three or four days; a swelling takes place in the axilla, with pain and weight; on the seventh or eight day shiverings, head-ache, with fever take place, and the eruption appears: When the case is unfavourable, the inflammation is of a purple colour round the pustule: When otherwise the circle around it is of a deep red and narrow.† If the inflammation does not take place by the fifth day, the inoculation may be repeated.

Taken internally with a dose of medicine the variolous matter produces no effect: Rubbed on the skin without wounding the surface, it also does not communicate it.‡ After inoculation the wound inflames and suppurates, and

* To this it is owing that the inoculated takes precedence of the natural disease.

† Good's Study, vol. ii. p. 424. ‡ Thomas, p. 250.

though the constitution does not sympathise, nor the disease take place, yet the matter taken from the pock will reproduce the disease in another person. c.

Nothing has ever been suggested calculated to throw the smallest light on the curious fact, that the mode of reception into the system should thus influence the *quantity* of eruption. To so great a degree does this take place, that the mortality by inoculated small-pox, without any restriction as to age or strength of constitution, does not exceed one in five hundred.

Indeed so much is this the case, that it is now believed that preparation has but little effect upon the disease, produced by inoculation; though M. Dessorts adduces a number of facts to prove that the natural small-pox is rendered much milder by the use of mercurial medicines, and Van Wœnsel thinks he has proved the same thing in regard to the effects of calomel given some days before inoculation, and till the eruptive fever commences.

There can be no question that as the type of small-pox is influenced by the fullness and plethora of the habit, that this disease must be milder in the inoculated, because they are prepared by a low regimen: But there is another reason; inoculation produces the disease from a small portion of matter inserted into the skin; taken in the natural way the system receives a greater quantity of the poison, and of course the disease must be more violent: The system may be inhaling the poison for many days before it breaks out, and thus it may accumulate and at length appear in its most violent form; in inoculation also persons but slightly disposed to it are forced into the disease by the inoculation, it must therefore be milder, whereas those who take it in the natural way are generally those who have the strongest predisposition, as they are left to the causes naturally and generally acting at the time: this view of inoculation places the small-pox on a footing with other fevers. c.

We select for the period of inoculation that season of the year, and that time of life, when inflammatory tendencies are least to be expected. It is sufficiently ascertained that beyond a few doses of a cooling aperient, no preparatory course of *medicine* is requisite. A spare vegetable diet, cool air, and subacid drinks, will contribute to render the disease mild and safe. Improper management may of course increase the quantity of eruption, and with it the danger of the patient. Some attention, therefore, ought always to be paid to the treatment of inoculated small-pox; but the principles already laid down are equally applicable in the present case, and will be sufficient without further detail for the guidance of the student.

To induce success from inoculation, a good habit is necessary: The season should be cool; the patient should be kept in an airy and well ventilated place, at the same time be always comfortable: The matter should also be taken from a healthy person, and it should be fresh.

If the epidemic constitution is typhous or inflammatory, we must regulate our proceeding accordingly; thus it would not be proper to observe a low regimen during the prevalence of intermittents or of the typhus syncopalis; on the contrary, it would certainly bring on either of these diseases and be attended with death. Huxham gives many instances where, during the prevalence of low typhous diseases, the small-pox took the same character; this was so in the years 1740, 1741, and 1745: He states also that the use of mercurial

purges before inoculation, frequently brings on petechiæ, hemorrhages, and other typhous symptoms.* He dwells with great emphasis on the different types of small-pox: It is attended with no fever at all, or is typhous or inflammatory in every degree: He saw it with a low typhus for eight days before the eruption.

In general, in an ordinary state of the air and disease, it is ascertained that inoculation had better be performed on the strong and healthy; not on pregnant women, on the debilitated from any cause, nor on very young infants, on those who have scurvy, nor on those who are labouring under an acute disease: Children should not generally be inoculated till after they have cut their first teeth. In infants the pustules are almost always more numerous; and, therefore, in them it is dangerous in proportion to their youth; they should at least be four months old: Underwood states that, even at a later age, they are apt to die if inoculated. Old people pass through it safely if they are not too weak.

Some mild mercurial purgative every three or four days should be given for three times, if the patient is plethoric; if not, once or twice previous to inoculation; and when the patient is delicate, no preparation whatever is necessary: for an infant, one grain or a grain and a half of calomel should be taken at night, and a teaspoonful of castor-oil next morning repeated as above directed: During this preparation the diet of the mother should be entirely vegetable; adults may take a full dose of salts, castor-oil, or calomel and jalap, with the above diet: The character of the disease depends entirely upon the state of the system; if extremely febrile, it becomes confluent; if debilitated, the pox do not fill and the patient dies in a typhous state: The matter may be taken, either from a mild or a confluent case, from the varioloid form, or from the imperfect pock, produced by inoculating with genuine small-pox matter, after the patient has had the disease some time before:† Fever does not always attend the small-pox, as in the case of nurses, who are infected on the arms, from children lying on them, who have the small pox; this is true after inoculation also: The pustule produced by inoculating persons who have had the small-pox, does not always produce fever; yet persons will take the genuine disease from inoculation with the matter taken from it:

The second inoculation then runs its course more rapidly, being as far advanced by the third as the genuine is by the fifth day; it is sometimes followed by pain in the axilla, slight fever very early on the fourth or fifth day, and sometimes later: the water formed in the incisions soon dries up, and the elevation, hardness, and extent of the tumor round the incisions, in those who have had the small-pox before, when in the highest degree, are never equal to those who are capable of receiving the infection at first: The inflammation comes on early, increases and subsides by the time the eruptive fever appears in the primary inoculation; and when in the primary inoculation, the inflammation of the incision advances gradually till the time of the eruption, it is known to be a case of secondary inoculation by the subsidence of the tumor and hardness beginning to decrease at that time; whereas, in the primary inoculation, the fever, at the time of the eruption, is much more vehement.‡

When the patient has been inoculated, Huxham advises the feet and legs to be soaked in warm water for a short time, for several days before and after the appearance of the eruption, in order to determine the blood more to the feet; he states that it prevents the appearance of many pustules and much inflammation about the head and face, which, as in erisypelas, is more dangerous about the head than any other part: The pustules are in consequence much more numerous about the feet: The warm bath also, he thinks, lessens the fever: So strong is the effect of heat thus applied, that it induces pains in the legs; for on

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* Huxham, p. 133. London 1788. † Quier's letters on the success of inoculation at Jamaica. p. 90. 1778. ‡ Quier on the Small-pox.

the application of cataplasms severe pains are produced in them: The application of lead water, to the face, head and breast, or simple cold water frequently would prevent the eruption in these parts; indeed the cold affusion generally would be proper to lessen the fever where it rose high: It might, however, in the weak and debilitated have a bad effect: If the fever is very considerable and the eruption does not regularly advance, he advises the warm bath to the whole body: The fever having continued six days before the eruption appears, the warm bath or the vapor bath has then a good effect. c.

CHAPTER X.

CHICKEN-POX, COW-POX, AND MODIFIED SMALL-POX.

Early Opinions regarding Varicella.—Controversy respecting its Identity with Small-pox.—Varicella Lymphatica.—Varicella Variolodes.—Diagnosis of these disorders.—Of Cow-pox.—Its introduction by Jenner.—Progress of the Vesicle.—Surgery of Vaccination.—Small-pox and Cow-pox occurring together, or after each other.—Characters of modified Small-pox.—Causes of Small-pox after Vaccination.

EARLY OPINIONS REGARDING VARICELLA.

From the earliest periods at which small-pox was noticed, we read of a mild eruptive disease, liable to be confounded with it, but not preventing it; and consequently demanding attention with reference to diagnosis. This has gone by the several names of chrystalli, variolæ lymphaticæ, spuriæ, volaticæ, and pusillæ. By Riverius it was called varicella. Morton adopted from the vulgar, and introduced into medical language the term *chicken-pox*. The descriptions of this disease, which have been given by different authors, and their pathological views concerning it and its relation to small-pox, differ materially from each other.* It is clear that, acknowledging the necessity of diagnosis, they have yet failed in establishing it satisfactorily; for after the lapse of nine hundred years, the subject is declared to be so obscure as to demand fresh investigation.

For the last fifty years, authors have been in the habit of drawing their notions concerning varicella from the paper published by Dr. Heberden, in the first volume of the Transactions of the College of Physicians of London. The points of doctrine which he principally set forth were, that the chicken-pox arose from a specific contagion, affected the same individual but once during life, afforded no protection from small-pox, and was capable of being communicated by inoculation. It does not appear, indeed, that he ever witnessed inoculation in this disease; but in his description it is implied that it has been so propagated, although by mistake, and that an eruption followed which has

* See Cross on "The Variolous Epidemic of Norwich," in 1819. Part 2, Chap. 2. Sketch of the History of Varicella.

passed with inexperienced and hasty observers for the small-pox, from which however it does not secure the constitution. Dr. Willan, in 1806, bore testimony to the general accuracy of Dr. Heberden's description. He detailed the appearance of the eruption with more precision, but coincided in opinion that it is a contagious disease, affording no protection from small-pox, and communicable by inoculation.

CONTROVERSY RESPECTING ITS IDENTITY WITH SMALL-POX.

More recent observations have tended to show that some mistake has crept into the views of these authors concerning the pathology of varicella. It has been rendered highly probable that the genuine varicella is not communicable by inoculation;* but it has at the same time been shown, that many cases of *supposed* varicella do produce a disease by inoculation, which is not chicken-pox, but small-pox. Reasoning from these data, some modern authors have retained the notion of the specific disease varicella, but have given it new characters; while others have revived a doctrine which prevailed very generally in former times, and was distinctly avowed by Sauvages; viz. that chicken-pox and small-pox originate in one and the same contagion, and that *varicella* is indeed what its name imports, a mild, imperfect, or *modified* form of variola. In support of the latter opinion, many ingenious arguments have been brought forward in a work, which has certainly thrown much light upon the history of the eruptive diseases, connected in their origin or symptoms with variola.† The true solution of the difficulties which have encumbered this branch of pathology, appears to be this. There are two diseases distinct from each other in their origin and character, both of which have been designated by the title of *varicella.* The one is the varicella lymphatica, the true or genuine varicella, as described by Mr. Bryce. The other is the varicella variolodes, partaking more decidedly of the nature of small-pox, and from which true small-pox may be obtained by inoculation. These distinctions I shall keep before me in the remarks now to be offered.

The distinctions laid down in the two terms varicella lymphatica and varicella variolodes appear to cover the whole disputed ground, and state in so many words, the shades by which the chicken-pox approaches the genuine small-pox.

The arguments adduced by the believers in the identity of these diseases are, we believe, conclusive; they are founded upon the numerous varieties of small-pox which run insensibly into those of the varioloid, and admit of insensible gradations from the confluent to the mildest small-pox, and from that to chicken-pox; no distinct line can be drawn, on which a specific difference can be established between them; thus with regard to the fever; its duration and severity are from the slightest possible degree, or no fever at all, up to a con-

* Bryce. Ed. Med. and Surg. Journal, vol. xiv. p. 467.

† Thomson's "Account of the Varioloid Epidemic of Scotland," London, 1820.

tinuance of three or more days. The chicken-pox, the mildest variety, sometimes has considerable fever from one to three days:* Moore, who believes in the distinct nature of these two diseases, says, that the fever of varicella and small-pox are nearly the same in symptoms and duration;† convulsions usher in the former as well as the latter; vomiting and delirium also occur in it; in the varioloid disease, the eruptive fever also is sometimes equally severe as in small-pox, and sometimes less so than in chicken-pox:‡ The small-pox we have seen attended with no fever at all, or a very slight one, as in the case of secondary inoculation, formerly mentioned, and yet the disease is again communicated from it by inoculation: It was then stated, that the pustule from secondary inoculation completes its course by the ordinary time of maturation of the primary pustule, and is often as far advanced on the third day as the primary inoculated pustule is on the fifth:§ in the varioloid they partake of all degrees, from pustules which run their course in two days to eight; this I have seen; the experiments of Dr. Darrach shew that the same is true with regard to the vaccine; a pustule which runs its course much sooner than eight days will communicate the genuine disease:‖ The vaccine also sometimes has pustules diffused over the body, as the small-pox, varioloid, and chicken-pox have:¶ and sometimes, though rarely, a succession of pustules.** The appearance of successive crops of vesicles sometimes characterizes the small-pox†† in Edinburgh; it has also been seen‡‡ in the varioloid by Cross at Norwich, and in chicken-pox it is also common: The other qualities, the uniformity of the variolous and varicellous eruption in the vaccinated and in the unvaccinated, do not hold good; the chicken-pox appears equally in the vaccinated and in the unvaccinated: The varioloid follows vaccination and small-pox, and exhibits fair specimens of the latter in some instances;§§ which will be readily believed when the small-pox itself exhibits examples of pox in various degrees of progress, appearing late and maturating at the proper time, or not maturating completely,‖‖ from vesicles formed of simple elevations of the cuticle, to full pox, in the different parts of the skin of the same individual: The distinct, severe, and even confluent small-pox follow the vaccine:¶¶ With regard to the want of depression in the centre of the vesicle in small-pox, this occurs also in varioloid, and sometimes in the chicken-pox:*** As to the falling down of the vesicles on letting out the inclosed fluid, this takes place equally in small-pox, varioloid, and chicken-pox; the fact above mentioned, that all the varieties occur in the same skin, without fœtor, stopping at the pellucid state, and never maturating nor forming an areola or slough, is a sufficient††† answer to all the arguments that can be brought to prove that these diseases are different: the greater dimensions of the vesicle at the summit than at the base; the want of depression in the centre of the vesicle, and the want of hardness and prominence formed in the skin at the base of the pox, are

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* Thompson on Varioloid.

† See Bell on Vaccination, in New York Med. and Physical Journ. vol. iv. p. 454, quoting Moore's Hist. and Practice of Vaccination, p. 99.

‡ Thompson, Cross, Bent, Pougens, quoted in New York Med. and Phys. Journ. vol. iv. p. 455.

§ Quier on the Small-Pox in Jamaica, p. 77–78.

‖ Expts. in Philadelphia Journal for 1824.

¶ New York Med. and Phys. Journ. vol. i. p. 329.

** See Dr. Post of New York, also Drs. Rogers and Pendleton's cases in New York Med. and Phys. Journ. vol. i. p. 320—113.

†† See Quier on the Small-Pox of Jamaica, p. 82.

‡‡ Bell on Vaccination, in New York Med. and Phys. Journ. vol. iv. p. 457.

§§ Thompson and Cross passim, and the experience of all practitioners.

‖‖ See Cross, p. 126–139. ¶¶ See Cross, p. 60–61.

*** See Cross quoting Munro, p. 167.

††† See Cross, p. 159.

common both to the varioloid and small-pox:* the tubercular elevations, which succeed to vesicles and pustules, occur most frequently in natural small-pox, but, says Professor Thompson, they are sometimes present in pustules of the chicken-pox: The indented character of the vesicle is found at times in all the varieties. In fine, the supposed peculiarities of each are found in all the others.

C.

VARICELLA LYMPHATICA.

The eruptive fever of *varicella lymphatica* is very slight, and rapidly followed by an eruption which is distinctly *vesicular* from the earliest period. The vesicles when first seen are about the size of a split pea, perfectly transparent, and covered only by a cuticle as thin as that raised by a scald or blister. On puncturing them a clear lymph is evacuated, and they neither exhibit a cellulated structure nor a central depression. The eruption commences on the breast and back, and subsequently extends to the face, scalp, and extremities. On the second and third days of eruption, an irregular circle of inflammation surrounds each vesicle. The disease is attended, especially in children, with an incessant tingling or itching, which leads them to rub off the tops of the vesicles, so that the characteristics of the disorder are often destroyed at an early period. Even if the vesicle remains unbroken, the contained fluid becomes opaque about the fourth day, at which time the disease is in many cases with difficulty distinguished from small-pox by the eye alone. The vesicles are nearly always distinct. One case of confluent varicella, however, has been described by Mr. Ring. On the fifth day the vesicles appear covered with slight crusts, which are yellowish, scaly, and irregular, lying flat upon the surface of the body. In a very few instances only, have they been succeeded by pits. Dr. Willan and others have noticed that the vesicles of the chicken-pox do not all appear in one day, but follow each other in successive crops. This, however, cannot be urged as a diagnostic mark of the disease, for it occurs also in the modified small-pox.

VARICELLA VARIOLODES.

Such are the distinguishing characters of *varicella lymphatica.* If the eruption, instead of being vesicular, exhibits in its early stages the appearance of indurated basis,—if the vesicles have a central depression,—if, after discharging their contents on the third day, a firm tubercle be found below,—and if the crusts which succeed are compact, defined, of a clear horny smoothness, and elevated, the disease was the varicella variolodes, and arose from the contagion of small-pox. All

* See Thompson on Varioloid, and Cross on the same disease, for proofs of these facts.

authors are agreed that the former, or genuine varicella, affords no protection from small-pox. It is generally admitted also, that it sometimes spreads epidemically (as in schools); and hence some are inclined to attribute it to *specific contagion*. It is not now however contended by the best authors, that this contagion is communicable by inoculation, or that the disease affects an individual once only during life. I am not aware that varicella, in this its vesicular or genuine form, has ever been met with in adult persons. It would appear as if the delicate cuticle of infantile life was indispensable to its development.

The chicken-pox being a very slight disease, it is unnecessary to add any thing respecting its treatment.

COW-POX.

The introduction of cow-pox into general notice, is an event in the history of medicine too interesting to be passed over without some comment. The merit of the discovery rests wholly with Dr. Jenner, who made his first decisive experiment in 1796, and two years afterwards published his account of the *variolæ vaccinæ**. The practice of vaccination was eagerly adopted by all classes of persons in this country, and has since spread with astonishing rapidity over every quarter of the globe. The consequence has been the almost complete extermination of the small-pox from some countries, and a most important diminution of its malignity in others, where that desirable event has been impeded.

It has been satisfactorily shown, that there is an affection of the hoof of the horse in every respect the same with that of the udder of the cow, from which the term cow-pox has been derived. Both the one and the other are communicable to man by inoculation. The disease thus produced has the curious property of so modifying the human constitution, as in many cases to remove altogether the susceptibility of small-pox contagion, or failing in this, to secure at least the individual from the *dangers* of that formidable malady.†

The cow-pox is a disease deserving of investigation, on account of its great importance to mankind. It has its laws, characters, and anomalies, as well as other diseases of more urgency; nor

* The date of this publication is June, 1798.

† Some experiments have been made by Mr. Woodville and Mr. Coleman which did not succeed in producing the vaccine disease from the matter of Grease; others, however, have since been instituted, and with success, proving Dr. Jenner's opinion.‡ Dr. Carpenter of Lancaster county, (Penn.) inoculated a cow with the matter of small-pox and produced the vaccine. This source is more probable than any other. C.

‡ Med. and Physical Journal, vol. iv. p. 381 and 466.

can a practitioner judge correctly of the progress of vaccination, or pronounce with any confidence as to the security which it gives, unless he has studied the subject in its various details, and inquired into the sources of fallacy, and the modifications of which the disease is susceptible. Our experience in cow-pox is indeed still very limited. It has been only known for about thirty years, and it would be hazardous to say, that we are even yet acquainted with all its peculiarities. Viewed in this light, it cannot therefore be a matter of surprise, that the opinions now entertained by pathologists on the influence of vaccination differ, in some respects, from those of the early writers.

PROGRESS OF THE VESICLE.

The cow-pox is communicable only by inoculation, and has seldom been known to occur twice to the same individual in that regular form, such as it is my object now to describe. After twenty-four hours the punctured point begins to inflame, and by the help of a microscope, a small vesicle with a regularly rounded edge may be observed to arise. This on the third day appears to the naked eye as an elevated point. By the fifth day the vesicle is quite distinct, and lymph may be procured from it. The lymph is transparent, and like the matter of small-pox, is inclosed in little cells. On the eighth day, an *areola* or inflamed circle of about an inch and a-half radius, begins to form around the vesicle, which is now in its most perfect state. On the tenth day the areola is at its height, and the vesicle is pearl-coloured, perfectly circular, and well elevated. As the inflammation fades, it leaves one or two concentric red circles, which continue visible for two or three days. On the fifteenth day the vaccination may be considered as completed. The lymph in the mean time becomes muddy and dark, and ultimately desiccates into a mahogany-coloured crust, which drops off towards the end of the third week, leaving behind it a small, circular, cellulated, and indented eschar, with a well defined border.

During the formation of the areola, it is often stated that symptomatic fever may be observed in children, and this has been held out as a *test* of perfect vaccination; but the fact is questionable, and in vaccinating adults, it is certainly not met with. The true test of the constitution being affected is the regular progress of the vesicle. But this may be interrupted in several ways. It may pass through its stages too quickly to saturate the system effectually. The vesicle may be injured by accident, or by being rubbed. An erysipelatous inflammation may come upon the arm, and take place of the true areola, and pus may be formed instead of vaccine lymph. The system may be pre-occupied by some chronic cutaneous disease, by diarrhœa, fever, or some ac-

tive internal inflammation. Lastly, there exists in some children a constitutional indisposition to the cow-pox, not to be anticipated. Under such circumstances great difficulty is experienced in infecting the arm, and the vesicle, when produced, is slow in its progress, of small size, and surrounded by an imperfect areola.*

Of the interference of different febrile diseases with the progress of the vaccine vesicle, numerous instances have been recorded. The *suspension* of its progress might have been anticipated from the known facts of the reciprocal action of conta-

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* The symptoms of the spurious form are thus described by Sir Gilbert Blane;—"Vesicle amorphous or uncertain; fluid often straw-coloured, or purulent; areola absent, indistinct or confused with the vesicle; scab formed prematurely."

The details of the subject are indeed so diversified, that we must settle down into the opinion of one of the greatest friends of vaccination, that the only sure test of efficacy of vaccination is re-vaccination.

Three varieties of irregularity, are stated by Bateman to have been noticed in the pustules; viz: pustules, ulcerations, and vesicles of an irregular form. The pustule which is produced instead of the regular vaccine vesicle, is like a common boil, occasioned by a thorn or any extraneous body sticking in the skin; it also throws out a premature efflorescence, which is seldom circumscribed; it is of a conoidal form, and raised upon a hard inflamed base, "with diffuse redness extending beyond it: it increases rapidly from the second to the sixth day, and is usually broken before the end of the latter, when an irregular, yellowish-brown scab succeeds.* *Ulceration*, occupying the place of a regular vesicle, must be obviously incorrect; it probably originates from the pustules just mentioned, which, on account of the itching that is excited, are sometimes scratched off at a very early period; or, being prominent and tender, are readily injured and exasperated by the friction of the clothes, &c.†

With respect to the *irregular vesicles*, "which do not wholly secure the constitution from the small-pox," Dr. Willan has described and figured three sorts. "The *first* is a single pearl-coloured vesicle, set on a hard dark red base, slightly elevated. It is larger and more globate than the pustule above represented, but much less than the genuine vesicle: its top is flattened, or sometimes a little depressed, but the margin is not rounded or prominent.—The *second* appears to be cellular, like the genuine vesicle; but it is somewhat smaller, and more sessile, and has a sharp angulated edge. In the *first* the areola is usually diffuse, and of a dark rose-colour; in the *second*, it is sometimes of a dilute scarlet colour; radiated, and very extensive, as from the sting of a wasp. The areola appears (earlier) round these vesicles, on the seventh or eighth day after inoculation, and continues more or less vivid for three days, during which time the scab is completely formed. The scab is smaller and less regular than that which succeeds the genuine vesicle; it also falls off much sooner, and,

* This premature advancement was pointed out by Dr. Jenner as a characteristic of the irregular pock, in his Paper of Instructions for Vaccine Inoculation, at an early period of the practice. He also justly remarked, in respect to the "soft, amber-coloured" scab, left by these pustules, that "*purulent* matter cannot form a scab so hard and compact as *limpid* matter." *loc. cit.* p 99, *note*. In other words, that the scab succeeding a *pustule* is less hard and compact than the scab which forms on a *vesicle*.

† Dr. Willan, loc. cit.

gious fevers upon each other; but not only is vaccination retarded by these disorders (measles, scarlatina, chicken-pox, typhus, pneumonia, and the influenza), but it is occasionally rendered by them altogether inefficient.

These considerations point out the propriety of paying minute attention to the process of vaccination, of preparing the body, in some instances, for its reception, and of keeping the system, during its progress, free from inflammatory action, in the manner formerly practised in inoculation for the small-pox. It requires no argument to prove, that a process which is to *free* the constitution from a poison so active and subtle as that of small-pox, should be conducted with at least as much attention as was paid to its introduction *into* the system.

Besides the advantages resulting from the vaccine in exhausting the suscepti-

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when separated, leaves a smaller cicatrix, which is sometimes angulated.—The *third* irregular appearance is a vesicle without an areola."*

It is further stated by Bateman, that the lymph of the vaccine vesicle becomes altered in its qualities soon after the appearance of the inflamed areola; so that, if it be taken for the purposes of inoculation after the twelfth day, it frequently fails to produce any effect whatever, and in some cases it suddenly excites a pustule, or ulceration, in others an irregular vesicle, and in others erysipelas. If taken when scabs are formed over the vesicles, (as in the case of the pustules of small-pox,) the virus is occasionally so putrescent and acrid, that it excites the same violent and fatal disease, which arises from slight wounds received in dissecting putrid bodies.

This last circumstance has never occurred to our knowledge in this country; on the contrary, the recommendation given below for taking the matter from the dried scab is not only safe, but it is effectual, and is found the best mode of preserving the matter from one season to another.

Re-vaccination becomes imperatively necessary, when the regular vaccine pock is injured by rubbing or by accident—where the system is pre-occupied by any other disease, and where the scar is feeble and not indented.†

* It appears to me that Mr. Bryce, in his able and valuable work on the Inoculation of Cow-pox, has, without any sound reason, impugned these observations upon the "irregular vesicles," and considered the introduction of the terms as productive of "much injury to the true interests of vaccination," and as serving to screen ignorance or inattention in the operator:" and that his own reasoning, which amounts to nothing more than a hypothetical explanation (and consequently an admission) of the fact, is irrelevant. He divides the whole "into constitutional and local;" but at the same time admits, that he knows no criterion by which they are to be distinguished, save the ultimate security against small-pox produced by the one, and not by the other. (Appendix, No. x. p. 114, edit. 2d.) Now this is surely to screen ignorance and inattention, by representing minute observation of appearances as unnecessary. However, he more than compensates for this error of logic, by the ingenious test of a double inoculation, at the interval of five or six days, which he has established, and which is sufficiently mechanical, to be employed without any unusual nicety of observation or tact.—*Bateman's Synopsis, p.* 205-6.

† Cross on the varioloid.

bility to the small-pox, it also is useful as a remedy in many diseases: It has cured obstinate ulcers on the arms and chest, by inoculating their surfaces with the vaccine ichor; after which they become covered with a white film, suppurate, and heal: a glandular tumor has been vaccinated in four or five places, and it has got completely well. Scrofula, enlargement of the spleen, the result of miasmata, and rheumatism, have all been cured by it.*

SURGERY OF VACCINATION.

The following appear to be the most important circumstances which merit attention in conducting the process of vaccination.

The child should be in perfect health, and not less than two nor more than six months old. The lymph should be taken from a vesicle of the seventh or eighth day.† It is desirable in all cases to insert six or eight punctures in the arm, as the system is probably thereby more completely *saturated*, without any risk of severer inflammation ensuing. An ample supply of lymph is thus ensured; and it is a good practice not to inoculate above two or three children from the same vesicle, lest the *frequent* application of the lancet should cause the exudation of common serum, unimpregnated with the specific matter of the disease. The skin should be perfectly tense, and the lancet sharp. When the areola is beginning to subside, it is advisable to exhibit a few doses of rhubarb and magnesia. Great care should be taken that the vesicle be not rubbed nor injured in any period of its course.

SMALL-POX AND COW-POX OCCURRING TOGETHER.

I proceed to detail the phenomena presented by the occurrence of small-pox, natural or inoculated, with cow-pox. They appear to point out some analogy existing between these diseases, which, coupled with other circumstances, may well justify Dr. Jenner in having given to the latter the title of *variolæ vaccinæ*.

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* Cross on vaccination.

† It is taken in this country between the sixth and the ninth day of the pustule; it will however succeed, when taken from the scab, by wetting it with water: The scab is effectual, if sealed up and preserved from the air, for more than a year after the removal from the body: Infection is thus sent from England to the Mediterranean, and succeeds perfectly after many months: The scabs should also be kept as much as possible from heat and also from moisture: If the matter is used it should be taken on glasses, one-fourth of an inch square, and suffered to dry perfectly before it is put away. The activity of the matter is so great that the fluid of one pustule mixed with a quarter of an oz. of water produces a pock as distinct and perfect as if the pure matter was used; the effect also upon the constitution is equally perfect:* The punctures should be superficial—bleed little—and to secure its success, any high degree of inflammation must be stopped by cold applications to the arm. In order to prove the constitution, it is necessary to re-vaccinate; if the pustule then does not take effect the matter used is good: its failure is a sufficient proof of its efficacy.
C.

* Thomas' Practice, p. 268.

Dr. Willan found, that by inoculating with variolous matter at different periods, not exceeding a *week*, from the insertion of the vaccine lymph, small-pox followed. The eruption thus produced may appear as late as the fifteenth day of the vaccination, but the disease is milder and shorter in its course than usual, and it is *modified* in its appearances. In the case of *natural* small-pox, the sixth is the latest day at which it can appear after vaccination, so as to go through a severe and regular course. If it occur at a later period than this, it is generally modified; and this modified or imperfect variolous eruption was, in the early history of vaccination, often mistaken for an eruption from the vaccine virus. Many errors, indeed, have arisen from an ignorance of the phenomena that attend the combination of these two diseases. Their influence is reciprocal. If the eruption of the small-pox takes place before the areola begins to form around the vaccine pock, the latter loses its regular character, while the eruption of small-pox follows its usual course. If vaccination be practised immediately preceding or subsequent to the eruption of small-pox, the vaccine vesicle does not come forward. By inoculation with vaccine and variolous matter at the same time, both diseases run their usual course.

In this, however, there is some variety; they sometimes modify each other; sometimes the vaccine and sometimes the variolous matter takes effect. Experiments have been made upon the subject, by Woodville, Willan and Ferguson.

Dr. Woodville in 1799 vaccinated 510 patients in the small-pox hospital with vaccine virus, and produced in the greater number a general eruption of variolous-like pustules, instead of the vaccine pustule. Dr. Jenner thought that this result was to be attributed to the atmosphere of the hospital, which variolated them.

Dr. Woodville then mixed the variolous and vaccine matter and inserted it into the arms of twenty-eight persons: In one-half the small-pox, in the other the vaccine was produced: but in none were there many pustules nor much indisposition. These two diseases were no doubt the varioloid or modified small-pox; and from Dr. Woodville's observations were a perfect security against the small-pox: Dr. Willan also coincided with this idea; it has accordingly been proposed to inoculate with the vaccine, and when the pustule has taken effect, to insert in another part the small-pox matter; they will both then go on together and secure the system completely from further attacks. By this plan, the doubts of the upper classes with regard to vaccination will be avoided; as also the prejudices of the lower, and the patient be perfectly secured. If the pustule of the vaccine and the variola are placed so near together that they run into each other, the matter taken from the vaccine side of the pustule produces the vaccine—that from the variolous side the small-pox. It is said that when the vaccine disease is taken immediately from the cow, it sometimes produces pustules and a high degree of fever; subsequent inoculations with the same matter are not attended with these effects. When any inflammatory and dangerous symptoms occur, they may be referred to the matter having been bad, or to some defect of constitution in the individual at the time. C.

Such are the principal phenomena which are presented by small-pox and cow-pox occurring together in the same individual. A superior interest has lately attached to the occurrence

of these diseases after each other, at distant periods, particularly to that of *small-pox after vaccination.*

CHARACTER OF MODIFIED SMALL-POX.

The cow-pox had not long been introduced, before it was ascertained that the preventive power of the vaccine virus was not perfect; and every year's experience serves more and more to show, that a certain proportion of those who have undergone vaccination will take small-pox at a subsequent period of their lives. The circumstances under which this occurs, the causes to which it may be ascribed, the proportion of vaccinated subjects thus affected, and the characters of the disease so produced, have lately excited much attention, and they will require to be rapidly sketched in this place.

MODIFIED SMALL-POX.

The characters which small-pox presents when it occurs subsequent to vaccination, have been detailed with great minuteness by various authors, chiefly with the intention of establishing the diagnosis between it and varicella; but the view which we have taken of that disease will preclude the necessity of equal precision here. Small-pox has sometimes occurred after vaccination in its most perfect and genuine form, but in by far the larger proportion of instances, it is *modified* either in the aspect or progress of the pustules. So *completely* altered indeed is the appearance of the eruption, on some occasions, by the influence of previous vaccination, and so extremely mild is the character both of the fever and of the eruption, that the true nature of the disease could never have been suspected by one who had not observed it in a variety of instances, and marked the insensible gradations by which its characters run into each other. The *initiatory* fever is generally severe, but in almost all cases recedes entirely on the appearance of the eruption. The pustules are often hard or *horny*, but scarcely ever fail to exhibit the diagnostic mark of variolous eruption, depressed centres. They run through their stages with rapidity, maturating for the most part on the fifth day.

That this disease is a modified form of variola there can be no doubt, and in strict conformity with the language of the old authors we may call it the *varicella variolodes.* It follows exposure to variolous contagion; in its severer form it is capable of communicating the *casual* small-pox, and even the mildest varieties of it will, in the unprotected, produce genuine small-pox by inoculation. The danger attending it is very small. Mild as the inoculated small-pox is, small-pox after well conducted vaccination, in the great majority of cases, is even milder. In the

few instances where it has ended fatally, the result is attributable to some accidental circumstance, such as its concurrence with diseased lungs, inflamed bowels, or scrofula, rather than to the common and acknowledged effects of small-pox. It may occur at any period subsequent to vaccination. It has been taken by persons who had previously exposed themselves with impunity to the full influence of the variolous contagion. It may be communicated by inoculation, but it is received for the most part in the natural way.

The disease has been by some ascribed to incomplete vaccination, and the notion is probably in a great degree correct; for though it has been observed in a few cases where the progress of the vaccine vesicle was to all appearance regular, yet it has rarely occurred to me to witness it in a severe form, where the cicatrix was perfect, that is, of moderate size, well defined, *perfectly circular*, and *indented*. Deterioration of the vaccine virus from successive inoculations has been brought forward by other pathologists as calculated to explain the occurrence of small-pox after vaccination. This opinion, however, is unsupported by any arguments; and is quite irreconcileable with the phænomena of variolous inoculation. As little foundation is there for the hypothesis of a *spurious* cow-pox, once formed to explain some of the anomalies which this disease presents. Taking all the evidence that has been afforded us respecting small-pox after vaccination, it appears that we must seek for its cause partly in the imperfect saturation of the system with the vaccine influence, and partly in that law of the animal œconomy which regulates the susceptibility of variolous contagion. Natural small-pox in its severest form does not always afford protection from a subsequent attack of the disease. To that *peculiarity of constitution* which favours secondary small-pox, we must be content to refer those cases in which small-pox occurs subsequent to *perfect* vaccination.

The proportion of the vaccinated who are subsequently affected by small-pox in a *well-marked* form (for we may safely leave out of consideration the cases of mild varicella), is a point of the utmost consequence to determine, but no satisfactory conclusions can be drawn from the calculations which have hitherto been made. Upon this indeed must ultimately depend the fate of vaccination; but no reasonable doubt can be entertained from the facts now before the world, that the proportion is such as not to affect, in any sensible degree, the credit of vaccination; which must continue therefore to uphold the fame of Jenner, and the triumph of medical art.

CHAPTER IV.

OF THE MEASLES.

First Appearance and early History of the Measles.—Symptoms and Sequelæ of the Disease.—Pneumonia.—Phthisis.—Cancrum oris.—Putrid or malignant kind of Measles.—Peculiarities in the Contagion of Measles.—Prognosis.—Inoculation.—Treatment of the Disease.

EARLY HISTORY.

The Measles was introduced into Europe about the same time as the small-pox, and followed in its track. For a long time it was supposed to be only a variety or modification of that disease, and as such it is described by Hali Abbas and Rhazes. Diemerbroeck in 1687, and Morton in 1696, maintained the *identity* of small-pox and measles, nor was it until lately that the diagnosis was fully established. Sydenham described accurately the measles which prevailed in London in 1670, and to his history of the disease very little has been added by more modern authors. For the few additions which have since been made, we are chiefly indebted to Dr. Watson in 1763, and to Dr. Willan in 1800. Several *species* of measles have been described by nosologists, but they are all referable to one,—the *rubeola vulgaris* of Dr. Cullen: the other forms which measles assumes being only modifications of this, arising either from a peculiar condition of the atmosphere, or the constitution of the individual affected.

SYMPTOMS.

The measles commences with the usual symptoms of *pyrexia;* nor is it at first to be distinguished from an attack of common continued fever. The diagnosis is to be effected by a knowledge of the prevailing epidemic, and attention to those catarrhal symptoms which are the constant concomitants of the eruptive fever of measles. The mucous membranes of the head and chest are alike affected; the tunica conjunctiva, the Schneiderian membrane, and the mucous membrane of the larynx and bronchia. The eyelids are swelled, and the eyes suffused, watery, and morbidly sensible to light; there is a copious thin secretion from the nose, with sneezing; and lastly, a dry cough, with hoarseness and some degree of dyspnœa. Besides these catarrhal symptoms,

the eruptive stage of measles is marked by considerable heaviness of the head, and drowsiness, amounting in some cases almost to coma. The heat of the skin is great, the pulse frequent and hard, and the general marks of pyrexia severer than what occur in cases of common catarrh. The eruption usually shows itself on the fourth day from the occurrence of rigors, but it is sometimes delayed a day or two. Cases indeed have occurred where the previous catarrhal symptoms continued for eight days, or even a fortnight.

In the epidemic, described by Watson, the eruptions appeared on the second day. Dr. Hazeltine, of Berwick, (Maine,) observed an eruption on the mucous membrane of the fauces for three days previous to the appearance of the measles, as also on the gums. White aphthous specks have also been seen in the mouth several days before the eruption, and even before any indisposition; These specks increased in size and were accompanied with erysipelas of the fauces and mouth, extending down the pharynx.* Ptyalism sometimes accompanies the hoarseness. Epileptic spasms also accompany the first symptoms; coma is so common as almost to amount to a distinctive trait. C.

The eruption of measles first appears on the forehead, and gradually spreads over the whole body. It shows itself in the form of distinct, red, circular spots, which afterwards coalesce into patches of an irregular figure. The colour of the eruption is of a dingy red, very different from the *vivid* redness of scarlet fever. It is sensibly elevated upon the face, and often also upon the breast and back, but scarcely ever upon the extremities. Upon the first appearance of the eruption, the catarrhal symptoms and the accompanying fever sometimes subside completely, but this is by no means a frequent occurrence. Indeed they are often aggravated, so that upon the second or third day of the eruption it is not uncommon to meet with severe cough and dyspnœa, the measly catarrh merging, in fact, in acute pneumonia. The stomach too, in severe cases, is often very irritable during the first days of measles, with vomiting of bile, and excessive restlessness. On the second day the eruption on the face is most vivid, and as it declines on the face, is at its height on the extremities. In about five days it completely disappears from the whole body. A slight discoloration of the skin commonly remains for a short time, which in some cases goes on to desquamation.

The decline of the eruption is not always followed by the subsidence of the other symptoms. A considerable degree of cough, or difficulty of breathing, frequently remains, marking the continuance of that inflammatory disposition which characterizes the former stages of the disease. The pulse continues frequent, and full; and in scrofulous habits of body this state of disease occa-

* Quier's account of the measles in Jamaica.

sionally end in hæmoptysis, hectic fever, and genuine consumption. All the *sequelæ* of measles have an inflammatory character. Upon the decline of the eruption diarrhœa often comes on, and Sydenham was, I believe, the first to take notice that this frequently yielded to blood-letting. Among the other consequences of measles may be enumerated ophthalmia, swellings of the lymphatic glands of the neck, chronic eruptions of a porriginous character, discharges behind the ears, or affections of the bowels ending in *marasmus*. Inflammatory symptoms of an urgent kind often supervene when the practitioner is least prepared for them, and therefore a caution should be given to watch the patient attentively during the whole period of convalescence.

Among the irregular forms of measles may be first noticed that species of the disease, called by Dr. Willan *rubeola sine catarrho*. It is a very rare variety, and only interesting in a pathological point of view.* The diagnosis is here, as might be expected, very difficult, and seldom satisfactory until it has produced in another child the common measles, which it is capable of doing. The most remarkable anomaly which the history of measles presents, is its occasional occurrence in a very highly aggravated or *malignant* form; and this not merely in individual cases, but even as an epidemic. Such a form of measles prevailed at Plymouth in 1745, in London in 1763, and at Edinburgh, from September to December 1816.† The symptoms of the eruptive stage, in these epidemics, were unusually severe.‡ Extreme debility quickly supervened, with restlessness, or sometimes coma, a disposition

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* Dr. Hosack saw this variety of measles in the year 1813; it was attended with but little fever, and often without any whatever; it appeared in those who had the measles, and those, who took it, had the measles afterwards.

† Consult the Works of Huxham, and the Observations of Dr. Watson in the 4th vol. Med. Obs. and Enq.—See also the Ed. Med. and Surg. Journal, January 1817.

‡ The eyelids were much swelled, so that the eyes were with difficulty opened, the eye itself swelled and prominent; the meatus auditorius also inflamed; the cough hard and dry; when expectoration occurred the disease was mitigated; coma, delirium, or excessive headach appeared as the disease advanced; the fauces were of a deep red colour, as if the patient had angina maligna; the tongue foul, and the stools very fœtid: the eruption was often delayed till the fourth or fifth day, when typhus was apt to make its appearance. The duration of the eruption was various; if it appeared on the second day, it disappeared on the fourth, or at most, on the fifth or sixth day; when it did not appear till the fifth day, or later, it was protracted to the twelfth, fourteenth, or twentieth day, assuming at different times a red, pale, livid, or black color.* The other symptoms appeared either in a more violent degree, or earlier than in the regular kind: Inflamation of the lungs was more common: Suppurations appeared in the ear, eyes, brain, and other parts, and now and then were fatal.† Marasmus, phthisis, chronic diarrhœa, dropsy, caries of the bones, were also its sequelæ. C.

* Philip. vol. i. p. 438-9. † Ibid. p. 440-1.

to vomiting, a dry, hard, or black tongue, and a deep red colour of the fauces,—typhoid symptoms, that is to say, with great irritability of the stomach. In these cases too, the eruption did not exhibit its usual appearances. It frequently receded in the course of the first twenty-four hours; and when it first appeared was less elevated than usual, and of a dark and livid colour. A large proportion of these cases proved fatal; and on dissection, mucus was found collected in considerable quantity in the bronchia, with other marks of inflammation or congestion within the thorax. In the epidemic of Edinburgh in 1816, the recession of the eruption was the worst symptom; few recovering in whom this occurred. It was neither attributable to cold, nor to the too free use of cathartics. It is commonly said, under these circumstances, that the energy of the system does not prove sufficient to *throw out* the eruption. The more correct expression seems to be (and the phenomena of small-pox and scarlet fever give countenance to this view of the case,) that when the mucous membranes are violently attacked in the first instance, *metastasis* to the skin does not take place, which under common circumstances relieves them.

Measles, like any other disease, varies in the general affection of the system; in the measles of Edinburgh, the cases in which it occurred in the irregular form were those exposed to debilitating causes, as bad air, miserable diet, and all those circumstances which produce typhus: Sometimes the fever appeared and ended in death, without any eruption: It exhibited nearly the same characters as scarlatina in many cases, the livid colour and rapid recession of the eruption, the typhoid state, and the irritability of the stomach.

Dr. Quier describes an inflammatory variety of measles composed of the eruptive and the dysenteric stages, with cough, &c. The first symptoms were as usual; the extension of the inflammation down the alimentary canal introduced the dysenteric stage, which, if depletion had not been sufficiently used, ended in the common form of that disease, bloody stools, gripings, tenesmus and constant vomiting; a change of the erysipelatous inflammation into the phlegmonous, in the parts about the throat, also attended with incessant pain of the belly; inflammation, ulceration, gangrene of the intestines, protrusion of the rectum, with biles all over the body, and an itchy eruption over the skin, were among the symptoms: Sometimes the disease was translated to the brain: Sometimes the fever was constant during the day; sometimes it intermitted; dropsy also followed it: the most hearty, strong, and hale persons were the most subject to it, whilst the weak and debilitated escaped almost without any disease.

The lungs and intestines after death exhibit in the measles, strong marks of inflammation, inclining even to sphacelus: and when death takes place during the eruption, the trachea and its ramifications are covered with it. This form of the disease is described by Sydenham; it is produced particularly in adults by the use of a hot regimen, and is relieved by bleeding, and low diet: The eruptions by the too great use of stimulants, or warm clothing, grow black, and the lungs become highly inflamed. C.

PECULIARITIES IN THE CONTAGION OF MEASLES.

The measles arises from a specific contagion, the latent period of which is about eight days, varying however to ten, or even

fourteen. It has been disputed whether measles can be taken a second time. By some of the older authors its occasional recurrence was admitted, but of late years the fact has been most satisfactorily established. Dr. Baillie has described eight instances of the kind, and it is a singular circumstance that they occurred in individuals of the same family.* Dr. Willan has thrown out the suggestion, that where there are no catarrhal symptoms, the susceptibility of the disease is not removed.

He states that the disease occurs sometimes in another spurious form, which is also insufficient to protect the system from future attacks, as many persons thus affected who had the febrile, catarrhal, and eruptive symptoms took the disease a second time.† In Dr. Willan's cases, which occurred in his own family, the fact was clearly proved; the disease was taken a second time, in two individuals; it was not therefore a suggestion as the author states, but actual proof.‡ He also has observed that when the efflorescence without catarrhal symptoms has declined, a second appears with violent disorder of the constitution, on the fourth day from its commencement.§ Sometimes the fever appears without the eruptions,‖ also the contagion produces some of the symptoms of measles, without fever or eruption; Sometimes a second fever and eruption appear after the first has disappeared: Burserius and Morton relate instances of its appearance a second time.

The measles prevails generally during the spring months, and often along with small-pox. The circumstances which determine the severity of the disease in particular individuals are not very well ascertained, but it is certain that in scrofulous habits, and in those of a plethoric disposition, it is principally to be dreaded.

PROGNOSIS.

The prognosis is compounded of symptoms drawn from the general fever and the affection of the lungs; the more intense the fever, the more dry the skin, the harder, more frequent and fuller the pulse; and the more intense the other general and local symptoms the less favourable is the case.¶ When the eruption is not very favourable, it sometimes leaves pits like those which follow small-pox: the eruption continuing red longer than usual is an unfavourable symptom. The more early and free the desquamation, the more favourable the case: a black or livid eruption indicates great danger; they are often the result of too heating and stimulating modes of treatment. When the fever abates on the appearance of the eruption, and ceases at the period of desquamation, leaving the patient free from cough and dyspnœa, the case can only be considered as safe;** a diarrhœa toward the end of the disease is always salutary; it may increase so far as to become dangerous. When the diarrhœa abates, when the skin becomes moist, the cough and dyspnœa lessen, the pulse becoming fuller and less frequent, the restlessness diminishing, the case is favourable.††

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* Transactions of a Society for the Improvement of Med. and Chir. Knowledge, vol. iii. pages 258 and 263.

† New York Med. Rep. vol. v. No. 3.

‡ Rep. on the dis. of Lond. 1799, p. 207.

§ Descr. and treat. of Cut. dis. ord. iii. part i.

‖ Quarin, quoted by Philip, vol. i. p. 442.

¶ Philip. p. 431.

** Ibid. 434–5–6.

†† Philip on the Measles.

Death in the more violent forms results from pneumonic or dysenteric disease mortification of the rectum, pudendum, and cheek have also occurred: Ulcerations of the jaws also take place: Some die of emaciation. Inflammation of the lungs, adhesions, and sphacelations have also occurred.

CANCRUM ORIS.

The danger in measles principally arises from pneumonic inflammation, but in very feeble frames, and in the lowest ranks of society, where cold and poverty combine with disease in reducing the powers of life, the dreadful spectacle of gangrenous erosion of the cheek is sometimes witnessed. This affection, commonly called *cancrum oris*, begins in the inside of the cheek by a hard swelling. The gums ulcerate and the teeth loosen and fall out; a black spot next appears on the cheek, or at the corner of the lip, which rapidly spreads, and the child dies miserably. Such a complaint sometimes accompanies the latter stages of small-pox, and infantile fever, and sometimes it occurs idiopathically, but its pathology is always the same. Medicine furnishes but very imperfect means of combating it. Tonics and local stimulants are indicated, but their influence is very trifling.

INOCULATION.

Dr. Home, of Edinburgh, informs us, that he succeeded in inoculating the measles, by applying over an incision in the skin cotton dipped in the blood of a patient labouring under the disease. He states that the eruptive fever followed in six days, that the symptoms were mild, and the lungs not affected as in the casual disease. It does not appear, however, that these observations have been verified by any later experiments.* It is satisfactorily ascertained that the measles delays the progress of vaccination, and of the pustule of the inoculated small-pox. Two cases however are recorded, by Dr. Russell, of small-pox and measles running their regular course in the same individual, at the same time.†

TREATMENT.

The treatment of measles, in its common form, must be regulated chiefly by the symptoms which mark the tendency to thoracic inflammation. It is well ascertained that these are of-

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* Speranza has also succeeded in inoculating for the measles, by puncturing a prominent measle, with the lancet, and inoculating with the blood. He succeeded in six cases.*

† See also "Case of the simultaneous occurrence of Small-pox and Measles," in the Med. Chir. Transactions, vol. xiii, page 163.

* Bibl. Italiana.

ten aggravated by a free exposure of the body to cold, either during or previous to the eruption; and some have remarked, that this aggravation of the catarrhal symptoms is occasionally attended by a *recession* of the eruption. Moderate warmth therefore is on all accounts advisable in measles.

"It is necessary to be particularly careful not to exceed the feelings of comfort in this respect. When the inflammatory symptoms run high, the reduction of the temperature will be necessary; the report of the patient however should regulate this matter: Cool drinks are always proper in this disease, and a free ventilation, graduating the temperature as above directed.

The diet must be antiphlogistic, as roasted apples, barley water, sago, tapioca, arrow-root, linseed tea, oatmeal, or Indian gruel, and it should be given in small quantities and often repeated."

If, however, the patient be of a very delicate habit, the diet must not be too antiphlogistic, otherwise there is danger of typhus. Milk has been praised very much, particularly as it has a valuable effect in moderating the bilous diarrhœa, when it is too profuse: With regard to the use of exercise, it must be regulated by the state of the fever; if the patient is inclined to lie in bed, he may do so; but in general, where the disease is mild, this will be unnecessary. C.

It has been imagined that active purging during the early stage has contributed to repel the eruption, and thus to increase the danger of the patient. This observation I have never been able to verify. On the contrary, saline purgatives seem well adapted to diminish the inflammatory excitement which prevails throughout the whole course of the disease. In mild cases nothing further is required than promoting a gentle perspiration, and exhibiting an occasional laxative.

Where pneumonic symptoms prevail, a more vigorous practice is necessary; but a distinction is here to be made, which Dr. Willan has placed in a very clear point of view. The oppression of the respiration, and the cough which accompany the first appearance of this and of other eruptions, do not appear to depend on true inflammation, for they often go off suddenly, and they may, at any rate, generally be left to their natural termination. But is upon the third day of the eruption, when the dyspnœa and cough become aggravated while the eruption is declining, when the cough in particular is hard, and accompanied by pain in the chest, that an active system of treatment is required. Bleeding from the arm is then indispensable, and must be repeated in proportion to the urgency of the symptoms. Even children of a tender age require in measles this evacuation, for which leeches and cupping afford but an imperfect succedaneum. Children do not bear general blood-letting well, but they bear it better in measles than in almost any other disease. The immediate danger from pneumonia, and the more distant but not less alarming risk of phthisis, make it advisable to check the pneumonic symptoms in the speediest and most effectual way.

The remark of the excellent author, that children require to be bled in measles, is of the highest importance. It prevents and cures inflammations and congestions, obviates convulsions, diarrhœa, and most of the consequences of neglected or maltreated cases. We think, the remark applies to all fevers of high action in children, if the practice be scientifically regulated.

That a state of measles accompanied by an abject state of debility does occur occasionally and is to be treated by stimulants and tonics, no practitioner of much experience or theoretic knowledge can deny. It is nevertheless true, that the author's apprehensions of death from debility, occasioned by the removal of local congestions, and inflammations in typhoid cases, are generally groundless. If these local affections continue, the patient must, but if they be removed he may die: but as the patient usually falls a prey to disorganization, it scarcely ever happens, that he dies of debility unconnected with the local affection. P.

Saline and demulcent medicines are useful; opiates may be given with much advantage after bleeding and aperients, if the cough continues troublesome. A blister should be applied to the chest, but not until the strength of the pulse has been considerably reduced by local or general blood-letting. In the inflammatory sequelæ of measles, blistered parts have often a strong disposition to sloughing and gangrene.

The warm bath is often a powerful assistant when the lungs are violently affected in this disease. Dr. Armstrong advises it highly impregnated with salt. Dr. Lockyer also praises the cold affusion in the inflammatory stage of measles: it prevents the inflammatory affections of the chest by the suppression of the early excitement without any bad effects; on this subject, it will be proper to consult p. 99, et seq. of this volume.

Upon the decline of the disease, if the pulse remains frequent, it will be proper to confine the patient to a very mild diet, and to direct a saline draught, with a few drops of tincture of digitalis, to be taken every six hours.

The use of antimonials with nitre; or saline draughts, as the spirit of Mindererus, of salt of tartar neutralized with vinegar, or the citric acid; Glauber's salt ʒii. with the sixth of a grain of tartar emetic every two hours, will be proper throughout the inflammatory symptoms; at night they may be continued uniting with them a little laudanum to determine to the skin. The digitalis may also be combined with these medicines. It will not, however, answer so well in the first stages as blood-letting; and should not be relied on for the purpose of depletion, as it is slow in operating on the system.

If diarrhœa occur it must not be suddenly suppressed; it will be found best to promote it by gentle saline cathartics, as it will favour the depletion of the system, and the removal of the inflammatory diathesis. In some instances bleeding will put a period to the inflammatory character of the symptoms, and also to the diarrhœa. When, however, marks of weakness or typhoid symptoms appear, it must be suppressed; for this purpose chalk, kino, extract of logwood, catechu, in small doses will answer completely.

Sometimes the eruption suddenly recedes, and is followed by spasms, convulsions, delirium, stupor or great anxiety and restlessness. It must be immediately restored, and for this purpose the use of the warm bath with sinapisms to the breast and legs, and wine whey will be proper. The use of camphor and subcarbonate of ammonia, equal parts, to be taken in the dose of six grains every two hours will be found to be useful; or sulphuric æther ʒi:—or carbonate of ammonia, one, two, or three grains, according to circumstances; camphor, gr. ii. every two hours will also be valuable, given in a table spoonful of a solution

of the citrate of potash, or of the spiritus mindereri, nitre, grs. x; or camphor, grs. iii. with subcarbonate of ammonia, may be given to an adult every hour till the eruption appears. C.

The convalescence of measles does not bear the exhibition of bitter and tonic medicines, like that of many other febrile diseases.

On the contrary it will generally be advisable to keep the bowels open by saline purgatives, as it will prevent the appearance of pneumonic complaints, ophthalmia, the development of scrofula, dropsy, &c. which sometimes follow the measles: and if dyspnœa, with hoarseness, loss of voice, or any sign of local inflammatory action appear, it will be necessary to bleed from the arm, or locally by leeches near to the parts inflamed, to use the warm bath, with some of the above sudorifics, to keep the patient quiet and easy and continue the low diet. The ophthalmia may be relieved by the acetate of zinc, gr. i. to the oz. of water, applied often to the eye, avoiding exposure to a strong light; poultices of bread and milk to the eyes may also be useful, and if they do not agree, the above cold lotion. C.

When the measles assumes that malignant or typhoid form which we formerly described, recourse must be had to the warm bath, blisters, wine, and *cordials;* (aromatics, serpentaria, ammonia, ether.) The observations of Dr. Watson on the treatment of this form of measles are judicious, and applicable to disease in a very extended view. If bleeding under these circumstances be resorted to, as this author remarks, the patient loses more by the debility which is brought on, than is gained by the relief afforded to the circulation within the thorax. It may be remarked indeed generally, that in all typhoid fevers it is a point of great difficulty to determine, how far local congestions and inflammations are to be relieved, at the risk of reducing too much the tone and powers of the system. The malignant form of measles sometimes shows itself *sporadically*, that is to say, in individual cases, while the general character of the epidemic is inflammatory. The circumstance may generally be traced to the weakened condition of the child, the result probably of fever, hooping cough, scrofula, or some other preceding disease. Such cases seldom end happily, notwithstanding the most judicious practice.

In the epidemics described by Watson and Quier, different plans were pursued; though blood-letting was necessary in the first stage of the malignant measles, described by Dr. Watson, yet in the second after the febrile heat and eruption had gone, though the difficulty of breathing continued, it could not be borne; on the contrary, it increased the debility to an alarming degree. In the second stage, therefore, bleeding he considered as highly dangerous: local bleeding from the chest may, in such cases, be useful. Dr. Watson found that after bleeding, tartrite of antimony in small doses, so as to cleanse the bowels thoroughly, had a very good effect. Cool air, barley water, with vinegar or balm tea, and when the skin was dry with great restlessness, tepid bathing of the whole body, was found useful: this practice was confined to the inflammatory stage of the disease; when the debilitated state came on it was not advisable.

When the pulse was quick, low, and irregular, in the second stage, with great debility, wine whey, or wine was useful; laudanum also did good in the diarrhœa when combined with gentle astringents; Peruvian bark was given after the fever had subsided and nothing but debility remained.

Dr. Quier found blood-letting indispensable in the highly inflammatory dysenteric form before described in p. 230; he bled as soon as the patient complained, as much as he would bear; before the inflammation of the throat appeared, a purge of sulphate of magnesia was given with good effect; if the throat and alimentary canal, however, had become inflamed, they could not be borne; emollient decoctions were then used as the common drinks; spermaceti or gum tragacanth emulsions to relieve the cough, with small doses of laudanum at night, and lead-water, as a collyrium, were attended with benefit: Free bleedings were often necessary before the height of the fever; the spasms of the stomach and bowels, with incessant pain, were relieved by bleeding and two or three grains of opium in the course of the day; chalk and armenian bole were also used to allay the irritation of the bowels; starch injections with laudanum were also useful. Purgatives after the disease of the stomach and bowels had fairly set in, sunk the patient too much to be borne; they were not even used till after the whole irritation had disappeared from the fauces and the scabs had fallen off; then sweet oil, manna, or some gentle cathartic was useful. Bleeding was at that period hurtful. Opiates with emollients and demulcents, and blisters to the thighs abated the cough; whilst the dysentery tenesmus and gripings were relieved by opiates and oily purges: the purges were continued for some time, if fever, slight nausea, and tension of the belly returned with griping pains, which they did at the interval of some days, even after the convalescence had been established.* C.

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* Quier's account of measles in Jamaica, Lond. 1778.

CHAPTER V.

OF THE SCARLET FEVER.

First Notices of the Disease.—Nosological Distinctions.—Description of the different Varieties of Scarlatina.—Diagnosis.—Prognosis.—Pathology.—Principles of Treatment.—Nature and Treatment of the Dropsy succeeding Scarlatina.

FIRST NOTICES OF THE DISEASE.

THE scarlet fever is probably a disease of very modern origin. No mention of it is made by the ancient or Arabian authors, and the first time it is distinctly noticed is but little more than two hundred years ago. It has been suspected that the contagion came originally from Africa. Be this as it may, it first showed itself in a severe form in Spain in 1610, from whence it spread to Naples, where it raged epidemically in 1618. In 1689 the same disease made its appearance in London, and was described by Dr. Morton, though not with the accuracy of the first Spanish and Italian authors. In 1735 it broke out in North America, and spread gradually but slowly over that continent. One of the most curious circumstances in the history of the disease is the slowness of its diffusion.

NOSOLOGICAL DISTINCTIONS.

When the scarlet fever first appeared in Europe, it was in a very malignant form; but between the years 1660 and 1670, a febrile complaint attended with scarlet eruption was observed by Sydenham in a degree so singularly mild, that nosologists have doubted its being really the same disease with that which had previously occurred. Dr. Cullen believed it was specifically different. Dr. Withering states, that in his early practice he considered scarlet fever and putrid sore throat distinct diseases, requiring distinct methods of treatment. More enlarged experience however compelled him to renounce that opinion; and he says, that after paying the most assiduous attention to the subject, by observing the complaint in every difference of season, exposure, age, and temperament, he was satisfied that they constituted but one species of disease;—that they owe their existence to the same specific contagion;—that the variations in their ap-

pearance depend upon contingent circumstances, and their greatest differences not greater than those of the distinct and confluent small-pox.

VARIETIES.

The scarlet fever attacks the skin, the tonsils, and the mucous membrane in their neighbourhood. In mild cases there is *efflorescence*, with little or no affection of the fauces. This constitutes the scarlatina simplex. In very severe cases there is extensive ulceration of the fauces, attended with typhoid fever, but with little or no efflorescence. This is the extreme grade of the disorder, and is called cynanche, or scarlatina maligna. In the common or intermediate cases both structures are implicated, and the disease is then denominated scarlatina anginosa.

1. The scarlatina simplex commences with slight febrile symptoms. The eruption appears on the second day, first about the neck and face, in the form of innumerable red points, which in twenty-four hours or less cover the whole body. On the limbs, but especially about the fingers, there is a diffuse and continuous efflorescence, but on the trunk of the body the rash is distributed in irregular patches. The colour of the eruption is a bright scarlet, being always most distinct about the loins, and bendings of the joints. On the breast and extremities, in consequence of the great determination of blood to the miliary glands and papillæ of the skin, the surface is often rough, and there is an appearance of papillæ or even minute vesicles, as in miliary fever. This is very liable to happen when the patient is confined in a small room and loaded with blankets. The efflorescence spreads over the surface of the mouth and fauces; and the papillæ of the tongue, which are always elongated, extend their scarlet points through a white fur, thus affording one of the simplest diagnostics of the disease. The face is often sensibly swelled about the third day. The febrile symptoms are in some cases very slight. At other times there is considerable heat of skin, restlessness, and frequency of pulse. The eruption continues about three or four days, after which a desquamation of the cuticle takes place.

Sudden swellings of the lips and eyelids, coming on in the night and going off without any pain, and in one case, ending in suppuration and death; also of the cheeks, and throat, have been observed by Dr. Rush during the prevalence of scarlet fever: The swelling occurs irregularly on certain parts of the body; sometimes on the breast, and sometimes on the limbs, and not upon the neck and face. C.

2. In the more common form of the disease, the *scarlatina anginosa*, the precursory symptoms are more violent, and together with the cutaneous efflorescence, an inflammation of the fauces appears, going through its progress of increase and decline

along with it. Among the first symptoms of this disease is an uneasiness in the throat. The voice is thick, and deglutition difficult. The tonsils and fauces appear red and swelled, as in cynanche tonsillaris. For the most part this goes on to the formation of superficial ulcerations or specks. When these are numerous, they cause an unpleasant fœtor, and the throat is much clogged up with a viscid phlegm.

Weariness, dejection, chills alternated with fever, and transitory fits of sickness, restlessness at night, introduce the disease: The difficulty of deglutition proceeds more from an inability of moving the muscles of the throat than from the pain produced by the attempt, or the straitness of the passage; the muscles about the neck and shoulders, indeed, seem affected from the first commencement of the fever with soreness and stiffness, and feel as if bound round with cords: The eruption is introduced by a hot and dry skin, and a pricking sensation of needles; all these symptoms increase, the skin becoming more affected, till it is of the color of a boiled lobster, and smooth, and without the slightest appearance of pimples or pustules: The eyes and nostrils are also red, and in proportion as they are high coloured, so is the tendency to delirium.* The fever, which is often of a low type, Dr. Rush and Dr. Parry both state is sometimes inflammatory with cupped blood.† Indeed Dr. Parry remarks that no case in a person coming from London to Bath, even though very weak, was without inflammatory symptoms; they were always relieved by venesection; the dropsy which followed was cured in the same way: I know it to be a truth, that without bleeding in inflammatory cases, this disease is likely to terminate in croup, and active inflammation of the lungs: ulcers in the trachea appear from dissection to be a common symptom in all cases of scarlatina anginosa. C.

In this more aggravated form of the disease the efflorescence seldom appears before the third day. It chiefly comes out in scattered patches, always very distinct about the elbows. Frequently too it vanishes, and re-appears partially, and at uncertain times. About the fourth or fifth day from its first appearance it is generally gone, and extensive exfoliation of the cuticle begins soon afterwards to take place, and continues for ten days or a fortnight. About the seventh day it is not uncommon to find the patients complaining of considerable pain in their hands.

The nails and the skin from the tongue sometimes peel off about the same time; the desquamation generally begins with a perspiration; the eruption sometimes continues even to the tenth day.

When the case is violent, the eruption appears on the second. Bang saw it on the first day; it has also been seen within twelve hours after the commencement of the disease: This happens mostly in children, who become delirious and die on the third day. It appears first about the face, spreading soon over the neck and breast, and at last over every part of the body: Sometimes it disappears upon the second day, or within twenty-four hours after its first appearance, and in those (more particularly in children) in whom the disease does not terminate suddenly by death, Withering states, that often the skin becomes dry and harsh, the pulse continues feeble and quick, the mouth parched, the eyes heavy and sunk, the tongue hard, dry, and dark brown, with an aversion

* Withering, 1779, p. 3, 4, 5.

† Parry. Posthum. Works, vol. i. p. 168.

to all kinds of food, and great uneasiness upon the least motion; a discharge like mucus or pus, of an amber colour, runs in great quantities from the nose or ears; in these cases recovery is slow. This symptom is also noticed by Dr. Rush.

Sometimes adults also die upon the fourth day, more particularly if a purging supervenes: the eyes look of an equable shining red, like those of a ferret, without great sensibility to light: by lifting the eyelid this symptom is discoverable even before it becomes general over the eye: Livid spots also sometimes occur about the elbows, breast, and knees; great difficulty of swallowing, and trismus, are among its uncommon symptoms; inflammation in the eustachian tube, pains and soreness in all the limbs also occur: Sometimes the pulse is hard so as to justify the opening of a vein, the blood being sizy, and the crassamentum firm; the latter appears upon a change of weather.*

Dr. Rush has seen an eruption like the chicken pox attend the sore throat: other authors also mention it: the fever does not decline with the swelling of the throat or the appearance of the eruption, except in the most favourable cases; swellings of the maxillary and parotids sometimes accompany it, are painful on pressure, and by their protrusion affect the breathing; they end in abscesses on the sides of the neck under the ears: Sometimes the fever returns, particularly if the skin remain dry during the desquamation, and is followed by another eruption: a dry skin is always a sign of a protracted disease: The swelling of the parotids and running of the ears also portend the same thing;† they prevent as long as they continue, any moisture on the skin. C.

The febrile symptoms in this form of scarlet fever are usually very severe, and of a highly inflammatory character. The heat of skin is more intense in this than in any other fever of our climate. The pulse generally averages 120. There is always much restlessness, languor, and oppression of the breathing. The countenance is expressive of very peculiar anxiety. The eyes are suffused. Head-ache is often a very urgent symptom. The decline of the disorder is usually attended with marks of great debility; and not unfrequently permanent deafness is left by it.

The pulse is often quick, small and feeble; obstinate dropsies, suppurating swellings about the neck, nose, and ears, leaving incurable ulcers, involving the soft parts as well as the bones, also follow it; it affects also the mouth, lips, palate, the arms, and the anus: the trachea, the lungs, are also the seat of chronic diseases, resulting from it. Dr. Rush mentions a squeaking voice, resembling the croup, as accompanying it: Epilepsy sometimes precedes and follows the dropsical swellings: they are said not to be fatal, but are generally owing to cold, or some irregularity in diet. Sometimes the dropsy affects the brain, producing wakefulness, blindness, coma, expansion of the iris; sometimes it attacks the lungs, with symptoms of dropsy of the chest; the skin being dry and harsh; the urine of a deep brown colour, depositing a sediment of a mahogany colour, and in a powdery form. C.

3. The third or *malignant* form is that which the scarlet fever assumed in London in 1745, and which is so accurately described by Dr. Fothergill. It is ushered in by rigors, attended with giddiness, acute head-ache, restlessness, faintness, a sense of heat and soreness of the throat, vomiting or purging. An efflo-

* Withering, p. 8–17

† Philip. p. 43–4.

rescence appears at irregular periods from the second to the fourth day, but is seldom permanent. A remarkable tumefaction of the fingers sometimes takes place, which, with the erysipelatous tinge they soon acquire, is often of itself sufficient to characterize the disease. In the throat appear dark sloughs surrounded by a livid base, and occasioning intolerable fœtor. The parotid glands swell, and become painful to the touch. The mouth is encrusted with a black or brown fur, and a viscid phlegm clogs up the fauces, so as even to threaten suffocation. The inside of the nostrils appears of a deep red or livid colour, from which a corrosive sanies flows, excoriating the angles of the mouth and cheeks. These symptoms are often accompanied by severe diarrhœa, with hæmorrhages from the nose, mouth, and bowels. Those who escape these dangers, have afterwards to struggle through the extreme weakness left by the disease, and the diarrhœa, or hectic, which often supervene. The accompanying fever is typhoid. The pulse is small, feeble, and irregular; and often, from the very commencement, there is delirium or coma.

Sometimes the pulse is quick, hard and small; in others soft and full, without being tense as in inflammatory diseases:* The blood is fluid, and fresh, the crassamentum loose; serum yellow and large in quantity: The thirst is less than is common in high fever.

Sometimes the disease approaches without fever, the ulceration making great progress into the lungs and bowels; alternate chills and heats; sometimes only anxiety and general distress precede it, the person going about till at last he is obliged to lie up; hoarseness, cough, heaviness and oppression at the breast with constant sighing; the face and hands swelled and red; sickness at stomach, dejection of spirits, sudden weakness, faintness, the pulse with a quick, small, or a heavy, undose beat; the urine pale, thin, crude and watery; in small quantities and high coloured, or like turbid whey; with heavy, reddish or weeping eyes, the countenance full, flushed and bloated, though sometimes pale and sunken, occur as symptoms from the beginning:

Previously to the sloughs, the fauces appear shining, highly red, swelled or covered with pale white patches, surrounded by a livid or red colour, and followed by the sloughs, as the author mentions: The tonsils and whole inside of the throat are swelled and inflamed, or a swelling suddenly appears in a neighbouring part, as behind the ear, which subsides into the throat; these symptoms gradually become aggravated; the sloughs increase; vomiting, coma, and delirium, in addition to the above-mentioned symptoms, appear; the tongue becomes covered with a thick, yellowish or brown coat, the breath becomes nauseous, the smell increasing hourly till at last it becomes intolerable: the symptoms gradually increase, the voice is hollow, and hoarse, with a rattling stertor, as if the patient was strangling: Those who recover about the third or fourth day spit up a great quantity of stinking putrid mucus, tinged with blood, livid and fœtid; This discharge getting into the trachea or bowels produces inflammation, which is often fatal: Sometimes the scarlet eruption comes on before, and sometimes after the soreness of the throat: it is partial or general, erysipelatous or pustular, in different degrees; of a crimson colour, with great swelling or inflammation of the skin, relieving the internal symptoms at times, at others not at all:† Swelling, livor, with an intolerable stench take place before death.

* Med. Communicat. vol. ii. p. 371.

† Huxham, vol. ii. p. 276 et seq. Lond. 1788.

DIAGNOSIS.

The only disease with which scarlet fever is liable to be confounded is measles. From this it is to be distinguished by the character of the eruptive fever, the colour of the efflorescence, and the affection of the fauces.

In obedience to the general system of arrangement observed in this work, we state the diagnostic qualities of the various grades of scarlatina considered with regard to other diseases, though the diseases of the skin run into each other so insensibly, that we are disposed to adopt the old opinion of Sennertus, that they are all varieties of each other; yet as, in this book, the author has chosen to consider scarlatina and measles as separate affections, we shall, without going farther, regard them only as prominent points in the great surface of analogical phenomena, which embrace the whole range of diseases of the skin. The distinctions below, of course apply to the middle and more prevailing grades of these morbid states; out of this pale, they will be found to shade off into each other in an insensible manner.

1. Character of the eruptive fever. The efflorescence of this disease appears generally on the second day: In the measles, seldom till the fourth. In the scarlatina it is more full, spreads more and consists of innumerable points and specks under the cuticle intermixed with minute pimples, in some places forming continuous irregular patches, in others coalescing with a uniform flush over a considerable extent of surface.†

In the measles, the rash is composed of circular dots partly distinct, partly set in small clusters or patches and a little elevated so as to give the sensation of roughness on passing the finger over them; "These patches are seldom confluent, but form a number of crescents with large intervening portions of cuticle which retain their usual appearance:"

2. Colour of the efflorescence. The colour of the rash in the scarlet fever is like that of a boiled lobster shell; in the measles, of a dark reddish-brown like a raspberry:

3. Affection of the fauces. In scarlatina, the cough is short, without expectoration: In measles, it is obstinate, harsh, and attended with the discharge of a tough acrimonious phlegm, coming up in repeated efforts:

4. Affection of the eyes. In scarlatina, the redness of the eyes is not attended with intolerance of light; the ciliary glands are not affected; and though they appear watery and shining, they never overflow:

In measles, the insensibility to light, and the inflammation of the eyes and eyelids is considerable: The eyes run tears, and there is great coryza, and sneezing:

In the scarlatina, depression, anxiety and great weakness attend the fever; in the measles, inflammatory symptoms, except in the typhoid variety.‡ C.

Where measles however occurs complicated with cynanche tonsillaris, as I have occasionally witnessed, the diagnosis may be difficult.

The common inflammatory sore throat (or cynanche tonsillaris) is distinguished by its occurring in the healthy, plethoric, young and vigorous: for the weak, delicate and infirm suffer less from it, and are also less liable to it: whereas the typhous form (or cynanche maligna) generally attacks the latter: and this last form is particularly distinguished by sickness, acute pain in the top and back parts of the head coming on in a few hours: and when the red-

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† Thomas, p 268. ‡ Thomas

ness and sloughing of the fauces appear, the typhous form is evident and well marked;* The redness of the face, neck and hands also distinguishes the disease from cynanche tonsillaris, which is a local inflammatory affection; cynanche maligna on the contrary is a disease of the whole system, affecting the throat more particularly.†

The delirium, also, which attends the scarlatina maligna, the ulceration of the throat, the hæmorrhages, the sloughs, also sufficiently distinguish it.‡ Cynanche tonsillaris ends in suppuration or schirrus.

The blisters, the slow spreading and limited redness of the skin distinguish it sufficiently from erysipelas. Petechiæ differ from scarlatina in being distinct and regular in their form, and in occupying mostly, the neck, back, shoulders, and loins. The blotches in scarlatina are generally broad, or one great surface of redness spreads over the whole body. C.

PROGNOSIS.

The prognosis in scarlet fever when it assumes either of the latter forms, should always be guarded. It varies of course with the degree of violence of the febrile and local symptoms. The malignant scarlet fever is a disease of the utmost danger. Some die as early as the third or fourth day. Some linger on till the second or even the third week; but generally it may be said that the patient is safe if he passes the ninth day. The recession of the eruption is always an unfavorable symptom; but the whole history of scarlet fever proves that it is more a disease of mucous membrane than of the skin, and the danger is therefore to be estimated by the extent to which that structure is implicated.

The signs of a favorable termination are lateritious urine, the abatement of the heat and fiery redness of the skin, which becomes of a brown colour; the desquamation of the cuticle and the subsidence of the tumefaction: also recession of the swellings, greater slowness of the pulse; the falling off of the sloughs; filling up of the ulcerations, easy sleep, and return of appetite. Great increase of fever and thirst, fœtid breath, the rash interspersed with livid spots, low irregular pulse, delirium, prostration, bleeding from the mouth and nose; severe diarrhœa about the sixth day; anasarca, atrophy, are unfavourable: This last affection often destroys in a few weeks. The fauces becoming dry, livid and glossy, of a brown or purple colour without swelling; ash coloured or brown specks soon ulcerating; the external tumour growing large, profuse sweats, great debility, petechiæ, delirium, coma, involuntary evacuation of the fæces, cold extremities, are also unfavorable in the highest degree. Sometimes inflammation of the trachea closes up the glottis and destroys life. C

Swelling of the parotid gland sometimes accompanies the period of convalescence, and proves both painful and tedious.

PATHOLOGY.

Scarlet fever arises from a specific contagion, which has a latent period of from four to five days. There is a peculiar susceptibility of it in infancy and youth. Sir Gilbert Blane observes, that he never saw a person turned of forty affected by it. It is

* Fothergill, p. 224. † Ibid, p. 226. ‡ Ibid 227.

not however in this respect upon the footing of small-pox and measles;—a disease, that is to say, which almost every one passes through; for many individuals resist it, although exposed to the full influence of the contagion. But though specific contagion is the generally acknowledged, and certainly the most prevalent source of scarlatina, there is yet abundant evidence that fever, attended with scarlet eruption, and possessing all the other characters of this disease, does occasionally arise from exposure to cold.

A great controversy has taken place upon the question of secondary attacks of scarlet fever. Dr. Withering and Dr. Willan never witnessed a recurrence of the disease. It has been satisfactorily shown however that this does occur, and second attacks have often proved severe.* Scarlet fever is commonly said to prevail chiefly in autumn, but it has been observed in all seasons of the year.† The *form* which it assumes in particular cases is partly to be attributed to the character of the epidemic, partly to external circumstances, and in part also to the constitution of the individual affected. It has been made a question, to what causes we are to ascribe the malignity of a particular epidemic. Season is said to have some influence, the inflammatory form of scarlet fever appearing in spring and summer, and the typhoid in autumn and winter; but no stress can be laid on this, for the complaint has been observed at the same time in all its forms, in individuals of the same family. Upon the whole we must acknowledge, that the circumstances which determine the severity of this or any other febrile disease have never been satisfactorily explained, and perhaps they are really inscrutable. It is not accurately known at what period a convalescent ceases to be capable of communicating the infection. The power of infecting appears to continue a very considerable time; certainly a fortnight from the decline of the efflorescence, and probably as long as any desquamation of the cuticle takes place.

TREATMENT.

Nothing need be said regarding the treatment of the scarlatina simplex; but the principles which are to guide us, when the disease occurs in either of its two severer forms, require considerable attention.

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* Persons who take the scarlet fever and eruption without the sore throat, are liable on its appearance again to have the sore throat without the fever and eruption; and those who have the sore throat without the fever and eruption, are liable to take the fever and eruption without the sore throat: In this particular it resembles the small-pox and measles. C.

† The disease is most likely to appear in the end of summer, though it may arise at all seasons: A severe frost they say checks it, and afterwards it appears with more violence: it generally disappears in the spring, though it has continued for several years unchecked by any change of weather. C.

They have given rise to much controversy, and were certainly not satisfactorily explained till within these few years. The treatment of scarlet fever is to be regulated in the first place by the character of the accompanying fever. Where inflammatory symptoms prevail, they are to be moderated; where the typhoid disposition is manifest, the system is to be supported. To a certain extent, indeed, it must be allowed that the character of the fever is under the control of the practitioner, who by vigorous treatment at the onset, may prevent many symptoms of malignancy or putrescency; but this principle is only of partial application, for he has no control over the character of the epidemic. The other extreme, however, is equally to be avoided, which is regulating altogether the early treatment by the consideration of the *possible* symptoms which may arise. In a disease assuming such different forms as scarlet fever, the *existing* symptoms must be the guide of practice.

To allay the high vascular and especially cutaneous excitement which prevails in the early stage of scarlatina anginosa, affords us a second general principle of treatment. At one time it was supposed that blood-letting was necessary; but experience has proved, that in the cold affusion we possess a means of controlling this state of disease, safer, and for the most part, (though certainly not always) equally effectual. We are indebted to Dr. Currie of Liverpool for this improvement in practice. The great heat of skin renders the cold affusion grateful to the patient. The disorder prevails chiefly among children, in whom it can be applied with facility. In common cases of scarlatina there is not that degree of febrile weakness which the fatigue of a cold affusion would augment. There is no tendency to affection of the chest, as in measles, which the application of cold to the surface might aggravate. An ulcerated state of the throat forms no objection to its use. On the contrary, the cold affusion frequently checks this symptom in the most remarkable manner. The repetition of the remedy at intervals, proportioned to the urgency of the symptoms, is indispensable; it may be safely applied whenever the skin is *hot* and *dry*. It cools the skin, abates thirst, diminishes the frequency of the pulse, the head-ache, and the languor, and disposes to sleep.

Dr. Currie advises that the bowels should be freely opened by laxatives, of which the best is the submuriate of mercury; with cold water and lemonade, and water with muriatic or oxy-muriatic acid, as drinks, during the use of the cold affusion; He also gave a solution of tartrite of antimony, and he states that out of 150 cases, in which he used the practice, his success was nearly invariable. Vinegar and water applied to the body by a sponge may be substituted when the fever has abated, as a means of lessening it to a greater degree. It should never be applied when it produces chilliness, and when prejudice prevents its use it may be administered tepid. The great heat and dryness of the skin, the tension of the pulse, the patient still possessing considerable strength should be the indications for using it; avoiding it, when the pulse is low, small

and irregular. Drs. Mossman, Ried, Thomas, Bateman and Stranger,* as well as Dr. Currie, give satisfactory testimony of the value of this plan.

Sometimes however the disease is completely typhous from the first; the seizure is then sudden, with a sinking pain at the stomach; an extreme prostration of strength; an irregular feeble pulse, with stupor, delirium, convulsions or sleepiness which continues till death: vomiting, purging, profuse sweats, bloatedness of the habit, swelling of the throat as if from the mumps; cadaverous odour, with dissolved blood, and every mark of debility; in these cases, cold affusion or any other active depleting means would be fatal.† They are likely to occur in northern latitudes, and where the system has been debilitated by previous illness.

The typhous symptoms of scarlatina seem to be often produced by the abstraction of blood, filling the vessels of the surface, and also from the inflammation of the skin, which, as in extensive burns, depresses the system; it will therefore require great judgment in the practitioner to determine when stimulants are to be used; Dr. Withering, though the pulse was weak and feeble, found them hurtful, except in their mildest forms, as camphor, &c. The truth can be discovered by feeling our way cautiously and taking the proper precautions not to give them in too large doses; if they excite heat of skin, increase of thirst, delirium, &c., they must be avoided: Withering found the bark extremely useful; in prescribing it, however, the greatest circumspection is also requisite. The livid spots which appear upon the skin which look so much like gangrene, often proceed from the rupture of a blood-vessel; the sloughs in the throat arise always from inflammation: they are, therefore, to be treated in the first stages by the antiphlogistic plan above advised; if the typhous state has set in, bark does wonders. Experience can only determine when this is the case: If this or any other stimulant are received with dislike, produce heat, thirst, restlessness, increase the delirium or distress in any shape, they must be avoided: On the contrary, if the patient feels better, the mind is clearer, the fever cooler, there is no doubt that they are useful. Oppression, anxiety and great debility, with a pulse so quick and frequent, that it cannot be counted for a quarter of a minute together, shew that these stimulants will agree with the system, and that blisters are useful:‡ In general, however, the latter remedy is not advisable at any season. If the brain was much affected with delirium, Dr. Withering found that they did no good; on the contrary, harm. When the disease became more typhous in its character, towards the autumn, a blister round the throat was useful, but less so in inflammatory diseases, and this can be well understood from the excessive disposition to inflammation of the skin which characterizes this disease. When the fever ceases and the debility is great, nothing gives so much relief as blisters.§ C.

Blood-letting is sometimes indispensable, especially when the disease attacks adults of full habit of body. An apprehension has been entertained regarding the debilitating effects of this practice in scarlet fever, which may safely be disregarded. Headache and general oppression are the symptoms which most urgently call for its adoption. Leeches to the temples are occasionally sufficient. These may also be applied with great advantage to the *throat*, when the swelling of the tonsils is very

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* Dunc. Annals, 1799, XII. Med. and Phys. Journal, vol. xi. 27, quoted by Dr. Thomas, p. 272.

† New England Journal, Jan. 1825.

‡ Withering, p. 91.

§ Ibid. p. 97.

great. They commonly bleed freely in this disease, in consequence of the excited state of the cuticular circulation.

With regard to the use of blood-letting, in cases of high delirium and coma, Navier found it to be particularly valuable when the pulse was hard, and the patient robust; the jugular or temporal artery has been advised to be opened in this case, a proof of the variable character of the disease,* and that it is not always typhous. Dr. Withering, however, found it seldom practicable from the lowness of the pulse; he states, as the scarlet colour of the skin declined, the fauces became more red, the symptoms pneumonic, and the pulse harder, the patient bore bleeding better; still not so well as in ordinary inflammations.

Dr. Morton has also advised bleeding from the arm, and when the head is much affected from the jugular vein; this may apply to the inflammatory cases, and when the hardness of the pulse, the excessive heat of the skin prove that this evacuation is imperiously demanded; these cases however rarely occur. But when the type is malignant, and followed soon by a sudden prostration, general bleeding will always be dangerous, and if practised it should be in limited quantity, and with the greatest caution. It is true that Dr. Armstrong advises depletion of a decided character early in this disease; and renounces entirely the stimulating plan formerly practised: at its first onset this may be proper; but we think that the bleeding had better be taken from the head and neck, the parts likely to suffer from the febrile nisus, and thus its strength may be overcome, without debilitating the whole system by a copious general evacuation, which will affect little the parts most likely to suffer, and if the diathesis is typhous, there will be less danger of incurable prostration. Dr. Armstrong advises during the paroxysm of excitement, if the cold affusion does not succeed in reducing it sufficiently, that a vein should be opened, and the operation repeated in an hour or two: By lessening the action he thinks it prevents the typhous symptoms which he supposes result from the recess of the fever. The head must be kept cool by towels wet with cold water, and be elevated to favour the descent of the blood; The bowels should then be freely purged by calomel and jalap, assisted by the sulphate of magnesia, and this plan followed up throughout the disease. If it is not carried into effect, in thirty hours after the attack, it is without avail. C.

Emetics have been strongly recommended throughout the *whole* course of scarlet fever; but they are not advisable, except at the very onset of the disease.

Ipecacuanha, or tartar emetic will be proper for this purpose, as they are useful not only in clearing the throat, of any improper secretions that may be lodged there; but also in preventing diarrhœa from the acrid sordes accumulated in the stomach.

They were given in union with calomel by Dr. Rush in 1783-4 with good effect; opium sometimes was necessary to be added to restrain their purgative effects, which often cut short the disease by suddenly putting a stop to the fever.

Withering states, that he often cut short the disease by giving an emetic early; and if taken later, it always relieved the anxiety, faintness and delirium; the tumefaction of the throat and the peripneumonic symptoms were also amended by it in the greatest degree; the vomit, (tartar emetic and ipecacuanha,) should be active and powerful, and repeated once in forty-eight hours; in the worst cases once in twenty-four hours.

R. Rad. Ipecac. ℈j. Tartrit. antimon. gr. i. m.ft. pulv., for a grown person: or the following mixture may be given, R. Tart. antim. gr. iii. Vin. Ipecac. ʒvi. Cret.

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* Navier de Reb. Commentar. p. 1. v. 4. p. 340.

ppt. ʒii. Aq. fontan. ℥vi. syrup ℥ss. m. Take a table-spoonful every half hour till it vomits, for an adult, and lessen it in proportion as the person is younger. In the typhous form they are pernicious.

Moderate purging is greatly to be preferred, and yet a prejudice against it was long entertained, probably in consequence of observing the danger of supervening diarrhœa. This symptom is however often prevented by laxatives, and it is perhaps occasionally dependent upon inflammatory action of the mucous membrane of the bowels.

For this purpose, rhubarb and soda in equal parts given to a child of eight years, three grains every two hours till it operates moderately; or calomel and rhubarb of each three grains at the same interval; or manna with tartar emetic in a solution will be proper: If there be costiveness, as the disease advances, glysters will be useful and the repetition of the purgative, which however must be moderated as symptoms of typhus appear.*

Dr. Hamilton, who attributes great virtues to purgatives, thinks that full and complete evacuation of the bowels is extremely necessary in this disease; and that its treatment principally depends upon it.† The use of purgatives however is only proper when the disease has an inflammatory tendency, and then they should be mild; they are said to remove the diarrhœa very successfully, and to deplete as well as blood-letting; Dr. Willan recommends calomel and antimonial powder in combination; Dr. Binns also testifies in favour of their use; of three hundred patients, treated principally by this means, none died; it must, however, be recollected, that in typhous cases cases the result will be dangerous. Indeed when there is a disposition to typhus, purgatives must be altogether avoided, as they are often followed by death in twenty-four hours; so sudden is the reduction of the system;‡ Dr. Withering quotes Sauvages, as witnessing the same results. We had better, in this last case, as a general rule, depend upon enemas: and if depletion is thought advisable, diuretics will be found to be the best plan. Dr. Withering, in cases where the pulse was weak and feeble, speaks highly of their value: He gave in the drink as much as two drachms of salt of tartar every twenty-four hours, with decided benefit. Vegetable acids, neutral salts, and the squills from their effect upon the stomach, or their being disagreeable, could not be given. C.

Gargles of infusum rosæ are useful at an early stage to wash away the vitiated mucus; when the sloughs are separating, barley water is preferable. In severe cases a blister may be applied to the throat.

In the malignant form of scarlet fever, treatment of any kind is of course less efficacious; but several of the measures already recommended may be had recourse to with a prospect of success.

In general, as we observed before, blisters will be found from their stimulating effects not to be useful, where the inflammatory tendency is considerable; and in the simple form, rubefacients or poultices will be sufficient; Drs. Willan, Rush, and others, however, have stated, that they have seen benefit from blisters. The gargles should be applied by injecting the fluid into the throat, and not by holding the head back, and moving the muscles of the fauces, as it will increase the inflammation: barley water acidulated with the nitric or muriatic acids; the tincture of bark, with the tincture of roses and water

* Thomas. † Ibid. ‡ Withering. p. 81.

are good gargles: Camphorated spirits of wine, honey and water injected into the throat, arrest the disposition to form sloughs, when the case is typhous: The infusion of capsicum, and the fumes of vinegar as hot as the patient can bear it, will be useful.

It is necessary to ascertain with precision the exact type and force of the symptoms and the remedies which are likely to combat it with success. When the disease is of an eminently typhous character, evacuants as in that observed by Fothergill, v. s. whether general or local, purges and sudorifics are all pernicious. They increase the delirium, difficulty of breathing and restlessness; The sloughs in the throat grow larger and blacker; cold sweats, quick pulse, stupor and death are uniformly the consequence of their use. The delicate, phlegmatic and debilitated by previous ill health, the indolent, the aged particularly bear evacuants badly in the typhous form.

Frequently lying in bed in this form alone is sufficient to arrest it; exercise increases the fever, and purging gives strength to it. C.

An emetic at the commencement of the disease has often proved of great service, and in some cases appears to have completely broken its force.

In the typhous form, the free use of boneset (eupatorium perfoliatum) tea, or that of chamomile after a dose of ipecacuanha, will be eminently serviceable; if given immediately on the onset of the disease.

Stimulant gargles, as of port wine, or of decoction of bark with tincture of myrrh, are of considerable use. The bowels should be cleared by gentle doses of castor oil, but severe purging is dangerous.

These remedies are peculiarly useful, from the necessity of discharging the fœtid ichorous matter which flows from the ulcers in the fauces, and which produces the diarrhœa, excoriations, hemorrhages, &c.; for it is observed when there is a free discharge from the mouth these symptoms are mitigated: as also the excessive sickness, faintness which attends the typhous form.* Calomel is praised as a valuable purgative, as it vomits gently which sometimes has a good effect. Sage, chamomile or rose leaf tea, made pleasant with the oxymuriatic, muriatic acid or vinegar and honey are proper gargles. If the sloughs are large, tincture of myrrh, with decoction of bark, or with honey and vinegar, are advised. These gargles may be injected into the throat, before eating or taking any medicine; the acrid sanies is thus washed away; and the diarrhœa, &c. the result of it is prevented.† If the sloughs separate slowly they may be touched with burnt alum and a probe; If on the removal of the escars, a bleeding should take place from a small artery, the application of a solution of alum, of blue vitriol, or of vinegar by tents, or by throwing the steam into the throat, and nostrils, and keeping the head raised and cool, succeed.‡ C.

Draughts with camphor, serpentaria, and ether, may be given at first every four hours; but as the disease advances, it becomes necessary to support the patient with decoction of bark and acids, wine, opium and aromatics. In the severe epidemic which prevailed in the West Indies in 1787, capsicum taken internally, and employed as a gargle, proved very serviceable. The cautions however formerly laid down, when explaining the treatment

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* Fothergill, p. 242. † Ibid. p. 244. ‡ Ibid. p. 219.

of typhus, apply here. Symptoms must be watched, nor must tonics be given upon the mere *theory* of their necessity.

In the epidemic alluded to the disease approached often without fever, the ulceration making rapid progress at the same time: It appeared to be in some measure local: The red pepper had, therefore, more effect: the pulse was weak, without being diminished in force: The receipt for preparing the gargle is as follows; "Take two table-spoonfuls of small red pepper and two tea-spoonfuls of fine salt, and beat them into a paste, and then add to them half a pint of boiling water; strain off the liquor when cold and add to it half a pint of very sharp vinegar; let a table-spoonful of this liquor be taken every half hour, as a dose for an adult; diminishing it in proportion for children."* This remedy divested the disease of its malignity, and cured almost all that took it: it is a stimulus of great power and would answer well in cases of common typhus. Sometimes it was given in much smaller doses: its first effect is to excite a kind of reaction in the stomach and œsophagus, attended with great heat in these parts, and still greater in the mouth and fauces; which gradually subsided and left a general glow over the whole body, though it excites the pulse but little: In some other epidemic sore throats, however, this practice was not attended with the same happy results: it depends very much upon the fever; if typhoid, of course it must be hurtful, and more cooling plans must then be used.

A saline mixture, composed of salt of tartar ʒii, lemon juice half an oz., and six oz. of water, or nitre 10 grs. every hour with one-eighth of a grain every two hours, if the fever runs high, in the beginning will be advisable; if the typhous disposition, however, should be more decided, then camphor, wine whey, or volatile alkali, or opium and camphor united may be given every third hour; the warm bath will also be found useful: They relieve successfully the fainting and excessive weakness which attend the typhous form: Wine may be also given with balm, mint, or sage tea. The remedies should be directed to procure general, equable sweats; for this purpose, the Huxham's tincture of bark, will be found highly useful, with the wine whey, &c. Huxham states that these sweats were always critical, when they came on about the third day; The elixir vitriol 10 drops thrice a day with the tincture of bark in claret or port wine and water, will be found to be valuable. In the low typhous form blisters to the neck from the ear to the clavicle are highly useful. Scarifications and removal of the sloughs by probes are improper, as they are followed by deeper escars below them; It has even produced death, from the inflammation the result of the violence.

The oxygenated muriatic acid, given in colombo tea, or in the infusion of bark, makes a pleasant and useful tonic; It must be given from a tea-cup, not from a spoon, as the acid acts rapidly on silver, and produces a poisonous compound. The plans generally advised under the head of typhus will be proper here.

The powder of contrayerva, with chalk, nutmeg or cinnamon is calculated to stop diarrhœa, and promote perspiration; The aromatic electuary—the aromatic powder and spiritus menth. piperitidis were used by Fothergill in the low form.

In the diarrhœa, he found that these stimulating remedies abated it; and if they did not succeed, he used after every stool astringents and anodynes in proportion to the exigency of the case: In the disease described by him, the diarrhœa mostly ceased after the vomiting in less than twelve hours after the attack; if it did not, the above means were used to arrest it.†

Sometimes the appearance of the diarrhœa causes the efflorescence suddenly to disappear, with faintness and insensibility: The use of cordials and as-

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* Med. Commen. vol. ii. p. 372.

† Fothergill, p. 233.

tringents then produces the eruption and arrests the diarrhœa. This practice applies we believe to all typhous forms of disease, even to dysentery; excess of purging debilitates, and must be stopped, otherwise the patient succumbs. The aromatic electuary ʒss, or the simple powder of contrayerva in the same quantity, are useful stimulants.

In the tendency to suppression of urine, with great tension and tumor of the belly common in this disease, emollient fomentations with chamomile flowers or other bitter herbs, and injections of salt and water, will be found to give great ease by the discharge of wind; gentle doses of rhubarb towards the fifth or sixth day, manna or the lenitive electuary, followed by the bark, have also an excellent effect: Calomel also is useful.* C.

The convalescence from this disease is always very tedious, but may sometimes be shortened by a judicious administration of bitters and cordials. At the same time it should be observed, that an excited and feverish state of the system frequently accompanies the process of desquamation, requiring the long continued use of *saline* as well as of active *aperient* medicines.

Slight fevers, like hectic, night sweats, want of appetite, lowness of spirits often follow scarlatina: Fresh air, with gentle exercise, animal food, as mutton, fowls and beef, will be found to be necessary restoratives. In Europe ass's milk was formerly much advised for it.

I have delayed to this period, all mention of a very remarkable phenomenon in the history of scarlet fever;—I mean the dropsy, which frequently succeeds it.† It generally takes the form of anasarca, but ascites has also been noticed. It as often succeeds the *mildest* as the severest cases. It occurs, on an average, upon the twenty-second day from the decline of the eruption, seldom earlier than the sixteenth, or later than the twenty-fifth. It is preceded for several days by languor, costiveness, and sickness. These symptoms frequently continue, accompanying a quick pulse. The urine is scanty, and often coagulates on heating. This species of dropsy sometimes proves dangerous from the occurrence of coma, but more commonly from thoracic symptoms indicating effusion in the chest.

In speculating on the nature of this affection, Dr. Wells decidedly inclines to the idea of its being inflammatory, and in this he is supported by the opinions of later pathologists. He argues that it is not owing to debility, for it often attacks those who are strong, and passes by those who are weak; its occurrence is confined to a particular period, though great weakness may exist before and after; and lastly, it is often attended with a white tongue and a bounding pulse. But it must be admitted that its

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* Huxham, p. 293. et seq. 1788.

† The reader will find a classical paper on this subject, from the pen of the late Dr. Wells, in the Transactions of a Society for the Improvement of Med. and Chir. Knowledge, vol. iii. page 167.

precise causes have never been clearly explained. The common method of treating this form of dropsy is by purging, squills, and digitalis. Some cases have lately been published pointing out the efficacy of bleeding. I have met with several cases, however, which appeared to indicate the propriety of bleeding and purging, but which resisted both, and ultimately yielded to bark and aromatic confection.

The pulse, heat of skin, thirst, &c. will determine the propriety of these plans; an emetic will be found useful, as well as the other depleting measures advised under the head of the febrile state.

When there is great debility, comatose or peripneumonic symptoms, large and repeated blisters have been found advisable: Withering recommends, more particularly, as diuretics, dilute solutions of salt of tartar, seltzer water, and squills, and when a free evacuation of urine is produced, tonics, gentle exercise, high seasoned food, wine, and flannel next the skin.* Dr. Underwood thinks that this affection arises from the too early and free administration of bark and wine in the milder scarlatina; it then occurs early on the disappearance of the eruption: hectic, a general soreness, with a great loss of strength also supervene.

If, in this case, the pulse be not full, he advises light cordials, soft demulcents, a light nourishing drink, obviating costiveness; also removal to the country.

With regard to the prevention of this disease it is satisfactorily proved, that by the confinement of the sick to a separate apartment, by ventilation, and frequent change of bed and body linen, and syringing the throat, also frequent washing of the hands of the attendants, perfect security will be ensured to the rest of the family: Thirty-seven boys in a boarding school in England were preserved perfectly by this means by Dr. Haygarth: The same practice preserved a school of young ladies at Bath; though the attendants, who were careful to wash their hands, did not change their clothes: The miasmata therefore do not adhere to the clothes. Confinement of the sick to a separate room in the house, with the above precautions will be sufficient to prevent the spread of the disease:† The upper story of the house might be devoted to this purpose, and by separating the sick, it may thus be entirely kept under: To assist in this object, fumigations with manganese, sulphuric acid, and salt as advised under the head of typhus; the use of the warm bath for the purpose of cleanliness, also frequent changes of linen; the cold bath, bark and wine, a generous diet, free exercise in the open air, a quiet state of mind and airy ventilated apartments will be useful auxiliaries: Dr. Sims found rhubarb in small doses a good preventive.

In Germany, the use of the belladonna has been proposed for the same purpose. Its author is Hahneman of Leipsic; Berndt of Custrin states that out of one hundred and ninety-five cases of children under fourteen, who took the belladonna, and were freely exposed to the contagion, fourteen only were infected; and that when he afterwards used a stronger preparation of that drug, every one escaped: all those exposed in families, who had the scarlatina, and who did not take the medicine, took the disease, whilst those who did, escaped. Other strong testimonies are given in its favour: Koreff of Berlin states, that if the belladonna be taken in proper doses for eight or nine days before exposure, the persons taking it are safe. The quantities given are very small: Three grains of the extract are dissolved in an oz. of cinnamon water, and of this two or three drops are given to a child under twelve months, and one drop more for every year above that. In general no effect is produced by it: Sometimes however it produces an eruption like that of scarlatina: It renders the attack more mild, if it does not prevent the disease; and if taken four or five days before exposure the disease never proves fatal.‡ C.

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* Withering, p. 99. † Thomas.
‡ Ed. Med. and Surg. Jour. Jan. 1825

CHAPTER VI.

THE MINOR EXANTHEMATA.

Herpes.—Herpes on the Prepuce.—Urticaria, or Nettle-rash. Lichen.—Roseola.—Pemphigus and Pompholyx.—Erythema.—Frambœsia, or the Yaws.—Its Symptoms and Progress.—Peculiarities in the Contagion of this Disease.—Principles of its Treatment.

In the present chapter I propose to treat of those lesser febrile eruptions, which do not, under any circumstances, go to the extent of affecting life, and are chiefly interesting with reference to diagnosis. They are herpes, urticaria, lichen, roseola, erythema, and frambœsia.

HERPES.

1. Of all the lighter varieties of cutaneous eruption complicated with fever, HERPES is that which is most distinctly entitled to the character of an *exanthema*. The term herpes is appropriated to a vesicular disease, preceded by febrile languor, and other marks of constitutional disturbance. The vesicles pass through a regular course of increase, maturation, and decline, terminating in most cases, in about a fortnight or three weeks. Herpetic vesicles are distinguished by their occurring in distinct but irregular clusters, appearing in quick succession, being set near together, and upon an inflamed base, which extends some way beyond the margin of each cluster.

To be more particular—its symptoms are, according to Bateman, a sense of heat, pains shooting through the chest or epigastric region, with fever for three or four days, followed by patches of pimples appearing on the breast and shoulders, with a circumscribed efflorescence round them, speedily putting on a vesicular appearance, and in two or three days forming a roundish cluster of transparent vesicles, others at the same time continuing to appear nearly in a line from the sternum to the spine on one side, or across the shoulder: in ten or twelve days they are covered with brown scales; sometimes an intense darting pain comes on at the close of the disease, scarcely to be allayed by the power of opium.* C.

* Bateman's Reports, 1819, p. 43-4.

(See plate under cut. dis. vol. ii. no. 18, div. iii.) The most frequent form of the disease is the herpes zoster, or *shingles*, in which the eruption appears on the abdomen, but is observed also in some cases on the extremities, or breast. Young persons, from fifteen to twenty-five years of age, are commonly the subjects of this disease. Very little is known regarding its causes. Anxiety of mind, change of climate, and irregular modes of life, are the circumstances which principally *predispose* to it. It is most frequent in summer and autumn, and seems in some cases to arise from exposure to cold after violent exercise. It is always slight, seldom confining the patient to the house, or occasioning any debility. Its course cannot be shortened by internal medicine, and it does not require any external applications. In hot countries, herpetic *ringworms* (herpes circinatus) often prove both tedious and severe, but in this country they follow the usual progress. That variety of the disease termed herpes *labialis*, occasionally appears as an idiopathic affection, originating from cold and fatigue. It is then preceded for two or three days by nausea, lassitude, languor, and sometimes severe feverish symptoms. It is frequently symptomatic of some internal disorder.* The common purgative draught, R. infus. senn. compos. ʒx. pulv. jal. gr. xv. potass. supertart. ℈i. syrup aurant. tinct. senn. āā ʒi. m. f. haust. repeated as circumstances may require, seems to comprise every thing that is really necessary in regard to the treatment of herpes.

In general this is true; in some violent cases the antiphlogistic treatment is absolutely necessary; the application of fresh lard to the vesicles has sometimes a fine effect in cutting short the disease.

The decoction of bark is certainly useful in the severer cases, and may be given in combination with the liquor ammoniæ acetatis, if the secretions of the kidney are scanty.

HERPES ON THE PREPUCE.

Itching and heat attract the attention to the prepuce; which exhibits small red patches, upon which are five or six minute red and transparent vesicles, which enlarge in 24 or 30 hours, and become milky, coherent, and pustular: if on the inside of the prepuce, so as to be protected, they break about the fourth or fifth day, and form an ulceration on each patch, which has a white base, edges slightly elevated, much resembling chancre, particularly if caustic has been previously applied. These irritants produce inflammation, and deep seated hardness: when no application has been made, the ulceration, after continuing for nine or ten days, heals, and the scabs fall off on the 13th or 14th day.

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* For more copious information concerning this and the other diseases treated of in this chapter, consult Bateman's "Practical Synopsis of Cutaneous Diseases." London, 1813.

When it occurs on the outer surface of the prepuce, the contents of the vesicles begin to dry about the fifth day into a dry acuminated scab, and the part heals below by the ninth or tenth day,* the scab falling off about that time.

Generally, however, it appears that the friction of the clothes or the fingers, presents the complaint to our observation in the form of ulcer, with a yellow white plain surface,† by the removal of the scab.

The vesicles of this form of herpes are distinguished from chancre by the circumstance, that there is no thickening of their basis; they resemble abrasions, only with the difference of the white speck, presented on their removal. If caustics have been applied, it exhibits the appearance of an irritable superficial sore.

There is another disease of the prepuce (venerola vulgaris) which deserves consideration; a pustule, drying on the spot, forming a larger and more solid scab than that formed in the above disease; the scab adheres closely to the surface, and if it be raised up it is attached by a stringy slough; a copious secretion of matter is also observed under it, which concretes on the scab already formed, and gradually enlarges it; when it separates an ulcer is discovered below, which heals by granulation.‡

These diseases are usually the result of indigestion. Laxative medicines, with lead water applied to the part; if it do not speedily heal, the black lotion, which consists of calomel (1 dr. with 6 oz. of lime water,) may be substituted.§

Herpetic vesicles on the eyelids, with smarting and itching, followed by inflammation of the conjunctiva, is treated best by gentle laxatives, and lead water. C.

URTICARIA.

2. There are several kinds of eruption attended with fever, which have occasionally been mistaken for measles and scarlatina. They are all very trifling diseases, but they deserve some attention on the score of diagnosis. One of these is the febrile Urticaria, or nettle-rash, (see plate vii. under cutan. dis. div. iii. no. 17,) a rare disease, of which a very scanty notice will suffice. It is preceded for two or three days by feverish symptoms. The eruption appears in the form of white elevations of the cuticle, similar to those produced by the stinging of nettles, and denominated *wheals.* It is very itchy, especially during the night, or on exposing the skin to the air while undressing. It continues about a week, occasionally fading during the day. In children it is brought on by the irritation of teething, and at different ages by disordered states of the stomach and bowels.

It occurs chiefly in summer, in the sanguine and plethoric, especially after taking improper food.‖ The pain and sickness are relieved as soon as the eruption takes place; it continues sometimes for years, but generally from one day to six weeks. Sometimes the wheals appear and disappear at short intervals; sometimes they are interspersed with small tubercles; at others they subside for weeks and appear again.¶ C.

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* Bateman.
† Evans.
‡ Plumbe and Evans.
§ Ibid.
‖ Good, p. 384–5.
¶ Ibid.

Modifications of the febrile nettle-rash are induced in particular constitutions by certain articles of food, shell-fish, almonds, or cucumbers. These cases are commonly attended with considerable disturbance of the stomach, languor, and oppression. A gentle emetic, followed by a common opening draught, is all that is requisite in the treatment of the febrile urticaria.

Honey, fruit, opium, herrings and lobsters when slightly tainted; certain fish within the tropics, as the herring and the yellow-gilled sprat, produce it: the morbid effects are confined to no part of the fish, do not depend upon copper infiltrated into its substance as has been said, and sometimes do not appear for a day after it has been eaten.

The symptoms of this form are, as the author states, weight and oppression at the stomach, nausea, vertigo, general uneasiness, numbness of some part of the body, constriction of the throat, a sense of heat about the head and eyes followed by urticaria, and its appropriate itching, tingling, and heated wheals, with great thirst, vomiting and diarrhœa.

Sulphate of copper, as an emetic, gr. x.—jalap immediately afterwards as a purge—and after the emetic operates, twenty or thirty drops of æther to allay the irregular and general symptoms of uneasiness, are valuable.

Vinegar, citric acid, and sugar taken with the fish are useful as antidotes.

The infusion of serpentaria (ʒii to the pint of water) is spoken of in a highly favourable manner in the common urticaria.* The itching may be allayed by camphorated vinegar rubbed on the skin; or cold water, applied on particular parts at once. Dr. Willan describes a case in which the disease was fatal: The man was a great drunkard; fever and delirium followed the fainting peculiar to it.

The juice of parsley is celebrated as a nostrum, to be applied to the surface: It is useless. V. S. purgatives and salivation have been found to be injurious: whilst a digestible and antiphlogistic regimen of milk and water, whey, buttermilk, eating a little at a time and often, an entire change of the mode of living, of air, and sea bathing are the best plans. In old cases some one article of diet offensive to the stomach is found to be the cause: It must be discovered by leaving off one by one the different accustomed articles of food. As fainting occurs generally where the eruption recedes, it is important to reproduce it: for this purpose, the warm bath, turpentine, blisters, and sinapisms to the skin are the best remedies: Several species of this disease are noticed by authors, as the perstans or persistent, the coalescing or conferta; the difference is merely in form: The aq. kali puri eight or ten drops, three or four times a day; the white precipitate ointment applied to the skin, are useful; also the muriatic, sulphuric, and oxymuriatic acids, cascarilla tea, ʒii to the half pint of warm water. It sometimes is incurable. C.

LICHEN.

3. A disease much more frequently mistaken for the genuine exanthemata is Lichen; and in some cases the diagnosis is by no means easy. The characters of the affection may be thus described. Lichenous eruption is papular, of a reddish colour inclining to purple, and exhibits, in many instances, the crescentic forms of measles. It is in clusters, and for the most part very copious about the hands and bendings of the wrist and elbow. It

* Cook's Practical Treatise, p. 209.

never advances to the formation of vesicles, but terminates, generally at the end of three or four weeks, by slight desquamation of the cuticle. There is considerable variety however in the progress of lichenous eruption, as well as in the symptoms accompanying it. In many cases, the constitution appears quite unimpaired. At other times, severe febrile symptoms have been observed to usher the disease in, and to attend it for four or five days. There is always an unpleasant tingling and itching of the skin in lichen, increased by the warmth of the bed, and whatever else determines the blood with unusual force to the surface. It is not a contagious disease. It is taken indiscriminately by those who have, and those who have not, passed through measles and scarlet fever. Eruptions of a lichenous character arise from various causes; sometimes from the heat of the atmosphere (constituting lichen tropicus, or the prickly heat of hot climates), sometimes from the venereal poison, but more frequently still, in this climate at least, from circumstances ill defined or altogether unknown. The disease, being wholly devoid of danger, may often be left to follow its own course; but saline aperients, low diet, and a cool regimen, are plainly indicated.

The warm bath is recommended, and also tonics when the rash has disappeared.

Wilkinson speaks highly of 5 or 6 grs. of carbonate of ammonia, every 4 or 5 hours, with 5 grs. of calomel at bed time twice a week, and followed in the morning by a purge. Aromatic vinegar diluted with one third water is to be applied to the itching parts with a piece of lint wrapped round the probe and repeated every day or two: using in the mean time the following lotion. Ammon. subcarbonat. and Plumb. superacetat. ℈i. aq. rosar. ℥iv, m. f. lotio. The varieties of this disease described by authors are the lichen tropicus or prickly heat; the simple (simplex); that which occurs in patches (circumscriptus); that which has a hair growing from the centre of each pimple (pilaris); the more violent form attended with fever or the (agrius) to which the above treatment applies. These distinctions arise out of formal and not essential characters and are therefore not worthy of notice. C.

4. A rash has been described by different authors as occasionally occurring in connection with febrile complaints, to which Dr. Willan has given the name of Roseola. It differs from lichen in being a mere efflorescence, of a rose colour, without papulæ. One of the most common varieties of it, is that which precedes in many cases for one or two days the eruption both of the *modified* and *inoculated* small-pox. Occurring under such circumstances, roseola has frequently given rise to much discordance of opinion concerning the real nature of the case. A similar eruption has been very often observed during the summer months, in persons (especially females) of irritable constitution.

PEMPHIGUS.

The diseases of pemphigus and pompholyx are distinguished by the former being attended with fever, whilst the latter has none. Languor, lassitude, followed by fever, the eruption of vesicles from the size of a pea to that of a

walnut are the symptoms of pemphigus: Sometimes the blister commences round a small brown point on the skin, produced by the rupture of a vessel: the vesicle enlarges, the blood tinges its fluid of a brown bluish colour; generally its contents are simply serous: the vesicles are sometimes followed by sores, which are covered with scabs like rupia, or degenerate into ulcers:

The vesicles affect the fauces and extend through the whole tract of the alimentary canal; great difficulty of swallowing, the appearance of vesicles in the mouth, distinguish it, when in the gullet; hiccup, pain in the stomach and nausea, vomiting a bloody matter, when in the stomach; general soreness in the abdomen with bloody stools, when in the bowels: The vesicles after they heal on the external surface, leave pits like those of small-pox, the parts remaining for some time of a dark colour.*

Swellings and abscesses of the parotid, inguinal and axillary glands, frequently accompany this eruption, which it is necessary to open early to secure the safety of the patient: When the vesicles appear in considerable numbers in the alimentary canal, with a small wiry pulse, the danger is considerable: Where the surface of the vesicles becomes gangrenous, with typhous symptoms, the danger is great: in general there is little cause for alarm where there is no fever.† The eruption sometimes is united with irregular forms of small-pox.‡ It occurs also without fever. Inoculation does not communicate it, as appears from the experiments of Dr. Hall.§ I have repeated them with the same result.

Erythema and petechiæ have been combined with it; it is sometimes epidemic, and attended with heat, itching and vesicles which appeared brown with a mild typhus relieved by saline and cooling medicines. Sometimes the symptoms have been inflammatory and violent, with ophthalmia, and a copious flow of tears.‖

In the mild febrile variety, purgatives, sudorifics, should be prescribed; when the dark serous vesicles appear with low typhous symptoms, tonics and laxatives are proper:

The inflammatory variety is to be treated according to the directions laid down under the head of Synocha; and in all cases the blisters are to be opened and kept clear with mild mucilaginous washes; and when they affect the fauces and alimentary canal, with diluents, avoiding irritating purges, which might produce ulceration through the intestines, which might be fatal.

This disease has appeared in Ireland as an epidemic among children. It assumed the typhous character, the fluid of the vesicle was purplish and turbid with pus surrounded with an inflamed border, and ending in spreading ulcers; skin livid; ulcers with dark edges, great discharge and fœtor, excessive constitutional irritation after the bursting of the vesicles, with a rapid decline of strength, convulsions and death; The ulcers destroyed the connexion between the cartilage of the ear, and the cranium, spreading to the eyes and crown of the head.‖ This epidemic evidently was a low fever with local determination, the result no doubt of bad air and unwholesome food. Poultices of oat meal and porter, followed by an ointment made of the scrophularia nodosa or great fig-wort, applied to the ulcers with good effect: yeast given internally was useful.‖ It was a typhous disease and treated accordingly. C.

POMPHOLYX.

Pompholyx, with which it has probably been confounded, is a *chronic* ailment, characterized by an eruption of bullæ, or vesicles of the size of walnuts, which continue to appear in successive

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* Philip. p. 344–5. † Ibid. p. 346.
‡ Sydenham on the small-pox of 1670–1–2.
§ Duncan's Annals, 1799.
‖ Medical Recorder, vol. viii. p. 87.

crops, occupying different parts of the body, but more especially the extremities. (See plate under cutan. dis. 10, divis. ii.) This disease is unattended by fever. It often lasts a month or six weeks, and appears to be connected with some *cachectic*, or depraved and debilitated state of the whole system. Pompholyx is particularly obstinate and severe in old people. It produces in them great itching and inconvenience, and from the extent of surface occupied by the eruption and the occasional intermixture of livid vesicles, presents, on some occasions, a very formidable aspect. Medicine, as far as I judge from my own limited observation, has very little power over it.

It is to be treated as a cachectic disease; in which the tone of the whole system, more particularly of the alimentary canal, is to be restored: Yeast, bark, wine, the mineral acids, sarsaparilla, pure air, exercise, purgatives, are most likely to benefit it. C.

5. Closely allied to roseola, and scarcely indeed distinguishable from it, is the eruption called by Dr. Willan *erythema*. It is characterized by a nearly continuous redness of some portion of the skin, with a slight elevation of the surface, speedily subsiding. The disease is not contagious, and the accompanying febrile symptoms are very slight. The principal species of the disorder is called erythema nodosum. The eruption is here confined to the fore part of the leg, and takes the form of large oval patches, which run parallel with the tibia, and rise into painful protuberances, much resembling nodes. The eruption subsides in ten or twelve days, but usually leaves the patient languid. Mild laxatives, followed by the mineral acids, are sufficient for its cure. It is a singular circumstance, that this variety of erythematous eruption is seldom witnessed, except in females. It occurs principally in the months of June and July.

6. Frambœsia, or the Yaws, deserves to be placed amongst the exanthemata, first, because it can be taken but once in life; and secondly, because it is propagated by specific contagion. It differs from them however in having no fixed course, but wearing itself out in a longer or shorter time. It may be considered, therefore, as the link uniting the febrile exanthemata to the chronic cutaneous diseases, porrigo, scabies, and lepra. Frambœsia is endemic in Africa and the West Indies, prevailing chiefly among negroes; but Europeans sometimes take it. It is preceded by a degree of constitutional disturbance, amounting, in some instances, to fever. An eruption of small pimples then follows, increasing for ten days, when pustules form. To these succeed loose irregular crusts, beneath which, foul sloughy ulcers are to be found, which gradually shoot out a fungus, resembling in size and appearance a mulberry. This occurs at irregular periods, sometimes as early as one month, sometimes as late as three from

the appearance of the eruption. The disease in about eight months wears itself out. The fungus contracts, and except where the inflammation ran very high, cicatrizes, without leaving any scar. The general health is but little, sometimes not at all, impaired in the progress of the complaint. It is not a disease of danger.

This, however, is not always the case; Sometimes the wretchedness of persons afflicted with the yaws exceeds belief: The symptoms grow worse from bad living and improper food:

Dr. Thomas describes the number and size of the pustules as proportional to the degree of fever on the first attack: Sometimes the tumours form upon the soles of the feet, where, from the thickness of the cuticle, they make their way to the surface very slowly and with great pain, rendering the person lame.

The yaws arises from a specific contagion, the latent period of which is seven weeks.* It may be propagated by inoculation, but the disease is not thereby rendered milder or shorter. In Africa, it is usually undergone, like the measles in this country, during childhood. It is altogether beyond the reach of medicine. Like the small-pox, it must run its course, and will leave the constitution, when, after completing its various stages, it removes the susceptibility to future infection. Towards its decline it appears to be somewhat benefitted by sarsaparilla, bark and acid, and a generous diet.

Little is known with regard to the treatment of this disease: Till it has come to its height, diet only is proper. A writer in the Edinburgh Journal recommends a bolus, composed of a scruple of sulphur and five grains of calomel, to be administered every night, when the disease is declining, avoiding salivation: The actual cautery applied to the tumors in the soles of the feet, after they have been softened by the application of warm water, has a good effect; the diet must be nourishing but not stimulating, and sufficient in quantity. The use of lime water as a drink, with the articles recommended above, and gentle escharotics to the ulcers on the body, with more active substances of the same kind to the principal sores, embrace the whole treatment. C.

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* See Edinburgh Medical and Surgical Journal, July 1819, article by Dr Thomson.

CLASS III.

PHLEGMASIÆ, OR INFLAMMATORY DISEASES.

CHAPTER I.

GENERAL DOCTRINE OF INFLAMMATION.

Universality of Inflammation.—Symptoms of external Inflammation.—Pain, Heat, Redness, Swelling.—Symptoms of internal Inflammation.—Pain, disturbed Function.—Fever, buffy Blood.—Terminations of Inflammation.—Resolution, Effusion, Suppuration, Gangrene.—Predisposition to Inflammation.—Causes of internal Inflammation.—Mechanical and Chemical Irritants.—Cold.—Morbid Poison and Contagion.—Metastasis.—Prognosis.

UNIVERSALITY OF INFLAMMATION.

Every organ and structure of the body is liable to inflammation; and, next to fever, this is the most important subject of inquiry in the wide extent of medical science. It involves several considerations of a general nature, which it will be for the advantage of the student to begin by pointing out. There are certain phenomena, for instance, observed to attend it in its progress and decline, whatever be the organ or structure attacked. The causes of inflammatory action also are very much the same, whatever part of the body be its seat. The *symptoms*, *terminations*, and *causes* of inflammation, therefore, constitute its fundamental doctrines, and this chapter will be devoted to their consideration. In the next I shall advert to the *varieties* of inflammation, whether occasioned by differences of cause, or function, or texture of the part affected. Some remarks on the *theory* of inflammation, and the principles of its treatment, will conclude the inquiry into the general doctrine of *acute* inflammation. Much interest, however, has lately attached to the subject of *chronic* inflammation; and it may not be foreign to our purpose to offer, in conclusion, a few remarks on that state of disease, such as may be sufficient to point out its principal pathological features.

SYMPTOMS.

When any part of the body which is obvious to our senses becomes inflamed, such as the skin, the tonsil, or the eye, there are four alterations from the healthy state of the part which become manifest. These are pain, heat, redness, and swelling. It is not any one of these symptoms singly, but their combination, which marks the existence of inflammation. The stomach may be painful from distension. The skin may be hot from fever. The cheek may be red from blushing. The breast may be swelled from the flow of milk. To determine how far each of these symptoms is to be considered an evidence of inflammation, is an object of some importance.

PAIN, HEAT, REDNESS, AND SWELLING.

1. A certain degree of pain attends every deviation from health. Pain arises from spasm, fatigue, distension, sympathy, irritation, and along with other symptoms it is an important criterion of *inflammation*. At first the pain attending inflammation is acute, or lancinating; afterwards it is a *throbbing* or pulsatile pain, and these varieties of pain indicate different stages in the process of inflammation. The kind and degree of pain in particular cases appears to be proportioned rather to the facility of distension in the part than to the quantity of nerves with which it is supplied.

2. The heat of an inflamed part is the least important and the most frequently wanting of all the characters of inflammation. It never can exceed that of the blood at the heart. It is most conspicuous, therefore, when inflammation attacks a part at the greatest distance from the centre of circulation; such as the great toe in gout, or the point of a finger in whitlow. There is reason to believe, that in the inflammation of internal organs, the heat of the part is not materially augmented.

3. Increased redness of a part, if permanent, is nearly decisive of the existence of inflammation. We find it after death to have occurred equally in cases of internal inflammation. It is obviously owing to one of two causes, or perhaps to both, the enlargement of old vessels, or the growth of new ones.

4. Swelling is an accidental symptom of inflammation, attributable to the degree of looseness in the structure and connexions of the part. Generally speaking, therefore, where there is least swelling there is most pain. Some structures of the body apparently inflame without any swelling at all.

SYMPTOMS OF INTERNAL INFLAMMATION.

Such are the signs of external inflammation, or phlogosis; but the physician has not, for the most part, the advantage which the

surgeon possesses, of judging by the eye of the existence of this state of disease. The symptoms of *internal inflammation*, or of *phlegmasia*, are more obscure, and require more minute investigation. Its presence is judged of in two ways,—by local and by constitutional symptoms. The local symptoms are pain, increased on pressure, and disturbance of function; the constitutional fever, and buffiness of blood.

1. Pain is the most important of them all; but in order to characterize it as the pain of inflammation, it must be *increased on pressure.* The test of pressure cannot, however, be applied in all cases; as in inflammation of the brain and bronchia, where a bony or cartilaginous case defends the inflamed structure. Pain again is not essential to constitute inflammation. Where the affection exists in an organ or very loose texture, there is little or no pain felt, as in peripneumonia. Cases have even been recorded, of inflamed brain and pericardium proving fatal without any such inconvenience being produced, as warranted the suspicion of inflammatory action.

Pain and irritation in distant parts are also proofs of the existence of inflammation in certain organs; as, a diseased prostate is known by pain in the inside of the thighs; inflammation of the liver by a pain in the shoulder; of the scrofulous hip, by a pain in the knee; disease of the womb, by a weakness of the lower extremities, pain in the back and hips; a diseased state of the pylorus, by heat and pain in the throat; inflammation of the testicles, by pain in the loins.* Diseased actions in distant parts also show the state of inflammation in other parts; as, hiccup is the concomitant of incipient mortification; excitement of the blood-vessels of the head, in certain fevers, produces nausea and vomiting; injuries of the brain have the same effect:† Inflammation of the kidneys also produces vomiting: Convulsions in children are often the result of inflammation of the covering membrane of a tooth, in dentition. C.

2. Disturbance of function is almost a necessary concomitant of inflammation; and wherever the function of an organ is understood, we may judge of the extent of inflammation in it by the degree of disturbance which its function undergoes. The particular symptoms referable to this head, are of course as various as the organ attacked. Delirium marks inflammation of the brain. Impatience of light, ophthalmia. Hoarseness, inflammation of the larynx; and dyspnœa, that of the lungs. There are only a few cases on record of inflammation existing in a part without disturbing its function.

3. Fever, more or less urgent, accompanies every kind of internal inflammation. In degree it varies, from the slight febricula which attends catarrh to the highest grade of inflammatory fever, such as is witnessed in phrenitis. It differs no less in kind than in degree. At one time it is inflammatory, at another ty-

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* Cooper. † Ibid.

phoid; in one instance it has a *hectic*, in another a *remitting* character. It may be held as a general rule, that the degree of local inflammation may be estimated by the violence of the constitutional symptoms; but at the same time it must be borne in mind, that the degree of fever present in any individual case, does not always bear a proportion to the importance of the organ affected, or the extent of local disease. It may run as high in cynanche tonsillaris, as in a severe attack of pleurisy, and frequently appears to be measured by peculiarity of constitution.

The degree of constitutional affection and nature of the fever varies very much in the organ affected; thus, in phrenzy, the full, hard tense pulse is most generally found with other signs of high fever; the inflammation of the heart, with abscess, has appeared without any violent symptoms; rheumatic inflammation, when translated to this organ, produces great prostration, anxiety and weakness, often a hard, rapid, and rather small than full, and sometimes an irregular pulse; it is sometimes incapable of being counted, at others is small, flying under the fingers and intermittent:* In common carditis the pulse is hard. The inflammation of the stomach is almost always attended with a hard and small pulse: In the irritation and inflammation attendant on the passage of a gall-stone, as also a small calculus through the ureter, the pulse is unmoved, and keeps the regular pace of health:† so that it is difficult to estimate by any regular rule the effect upon the heart and arteries of the inflammatory affections of the different organs. In a general way, from the effects produced by injuries upon one organ, as the skin, being proportional to its size, it is evident that in some instances there is something regular in this matter; this appears also from the influence produced by surgical diseases being proportional to their extent; thus a compound fracture produces more violent symptoms than those which are simple; but, when it is recollected that the slightest injury to a nerve, the puncture of a needle, will produce the most violent tetanus, this clue to direct our steps is not very certain; so that it is only by accurately attending to the state of the system, the causes and symptoms of diseases, as they will hereafter be detailed, that we can properly appreciate the connexion between the local affection and the general impression on the system. It will be found that the same general causes which aggravate fevers, have the same effect upon inflammation; thus, the systems of infants are less able to bear the irritation of fever in proportion as they are younger; this is true of the heat in this climate; the aged also die from weakness and fever produced by the extremes of temperature; the same is true of inflammations: Intemperance has the same effect on the habit with regard to the power of supporting fever and inflammations: Excessive abstinence, and loss of rest, also render the system irritable, and not so able to bear this process.‡ C.

Some persons, from these data, have urged, not without an appearance of reason, that the fever accompanying local inflammation is not always a secondary affection;—that in cynanche tonsillaris, for instance, it is not the swelling of a small and insignificant gland which raises the pulse to 120; but that fever is the primary affection, which from some unknown cause induces the local inflammation. Where neither the constitutional nor

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* Scudamore, 271. 123. London ed. 1827.
† Heberden, Med. Transact. vol. iii. p. 32.
‡ Cooper.

the local symptoms are urgent, it is common with some physicians to employ the term *sub-acute inflammation.* In a pathological point of view nothing is gained by its adoption, but practically it is of some use, as for instance, in distinguishing and directing the treatment of some cases of bronchial and rheumatic inflammation.

4. The last proof of the existence of internal inflammation is derived from the appearance of the blood drawn. All ages and countries have agreed in looking upon buffiness of the blood as a test of inflammatory action; but different ideas have been entertained as to the degree of importance which should be attached to it. Boerhaave and the followers of his school considered it as the decisive argument in favour of that *lentor* or spissitude of the blood, on which they believed inflammation to depend. Of late, physicians have rather been inclined to undervalue it as a symptom of inflammation. Upon a careful review, however, of all the arguments which bear upon this question, I am satisfied that buffy blood is a very important criterion of the presence of inflammation. Genuine inflammation, indeed, sometimes exists without it, and the first cup of blood may be buffy when the last is not. These and other anomalies are interesting in a practical point of view, but they do not affect the general question of the pathological importance of buffiness of blood. The cause of this appearance has been a frequent subject of investigation. It has been supposed to depend upon the slower coagulation of the blood; but this is obviously insufficient, for blood may coagulate slowly and not be buffy. That blood will prove buffy, may often be predicted from the bluish appearance which it exhibits while flowing from the arm. Some pathologists imagine, that the relative proportion of fibrine in the blood is augmented in a state of inflammation. Others attribute the phenomenon merely to increased rapidity in the blood's motion; forgetting that the blood is often deeply buffed with the pulse at eighty. The subject, it must be confessed, is still involved in great obscurity.

TERMINATIONS OF INFLAMMATION.

The progress of inflammatory action, generally described under the title of the *terminations* of inflammation, next claims attention; and here I must begin by observing, that whatever opinion may be formed regarding the *precise* condition of the blood-vessels in inflammation, it is obvious, from the general tenour of the phenomena now described, that they are loaded with an unusual proportion of blood. Of this they must be *relieved*, before the vessels can be restored to their natural healthy condition. The terminations of inflammation therefore consist for the most part of the several modifications of *effusion*.

1. When an inflamed part gradually regains its healthy state without any derangement of its structure, or any *sensible* effusion from its vessels, the disease is said to terminate by *resolution*. This is invariably the object of the physician, but the surgeon is often baffled by it, because he occasionally excites inflammation with a view of profiting by some of its subsequent stages. Resolution may happen, first, without medical aid, when the inflammation is very slight; and, secondly, when the requisite *unloading* of the diseased vessels has taken place by means of *local* or *general* blood-letting, or in milder cases by local cold and purging. We judge of the tendency to resolution by the *gradual* giving way of the symptoms of inflammation, particularly by the diminution of pain and fever.

2. The second termination of inflammation is an increase of the natural secretions of the part. In membranes which have an external outlet, such as the several mucous membranes, this is almost equivalent to resolution. In the shut cavities, as those of the pleura, pericardium, and peritonæum, such a termination of inflammation is more to be dreaded; but in many cases the fluid thus effused is gradually absorbed, and health ultimately restored.

3. The third mode by which inflammation terminates, is *effusion* from the vessels of the part, either of blood or of some of its constituent parts. The mucous membrane of the bowels, when inflamed, frequently relieves itself by a discharge of pure blood. In some cases the *serum* of the blood is effused, as in hydrocephalus and inflammation of the tunica vaginalis testis. In other cases the *coagulating lymph* of the blood is effused, forming adhesions, as in pleurisy and peritonitis. A peculiar gelatinous fluid is thrown out in rheumatism, and a saline matter in gout. The consequences of these effusions vary according to the violence of the inflammation, and the situation and structure of the part affected. Adhesions from pleuritic inflammation are productive of little or no inconvenience; occurring in peritonæal inflammation, they lead to incurable marasmus or ileus. The effusion of serum from inflamed vessels forms a part, and a very important part, of the general pathology of *dropsy*, to which we shall hereafter have occasion to refer. When effusion takes place in the substance of the solid viscera, they become hardened, and are rendered more or less unfit for the due performance of their functions. This is a frequent effect of *chronic* inflammation, and will be further noticed when discussing that branch of the subject.

4. The fourth termination of inflammation is the effusion of a new product of the blood, called *pus*, a bland fluid, of the colour and consistence of cream. When this is poured out into some cavity formed during the process of inflammation, an *abscess* is

said to exist; when the purulent matter forms upon an exposed surface, *ulceration* is said to be established. This subject opens an extensive field of inquiry; but it falls more properly within the province of surgery. By John Hunter and others, the different topics which it embraces, more particularly the nature of *ulcerative action*, have been investigated with great success; and among other points, that remarkable analogy has been explained which subsists between pus and a secreted fluid, between an ulcerating and a secreting surface. The formation of pus by internal inflammation exhibits nothing different from what occurs when the inflamed texture is in contact with the air. The symptoms by which we judge of suppuration having taken place in an internal organ are the following:—1. A change from the lancinating to the throbbing pain. 2. A sensation of weight or fulness in the inflamed part. 3. The pulse continuing frequent, but becoming soft and full. 4. The occurrence of rigors and of night sweats,—in other words, the development of *hectic fever*.

When an abscess is formed, the matter may be discharged either by the ulcerative process taking place on the surface, making an opening outwardly, or it may be absorbed, and taken into the system: in either case the sides of the cavity contract; granulations, or small red points, rise upon the internal surface and fill up the cavity: when most healthy they are of a florid red colour: when muscles and glands are the seats of abscesses, it is said that the new substance, which supplies their place, cannot perform the functions of the original parts; the skin, tendons, ligaments, nerves, bones, on the contrary, can be renewed, and perform their functions perfectly.*

Pus is a straw-coloured fluid which sinks in water, of a uniform consistence, a mawkish taste, exhibiting to the microscope, minute globules floating in a serosity: It is coagulable by a saturated solution of muriate of ammonia, but not by heat, forms a semi-pellucid, viscid, stringy substance not diffusible in water, when a caustic lixivium is added resembling in this state the mucus secreted by the bladder in certain diseased states of that viscus. It is inodorous when cold, when warm it has a peculiar smell, and is often disagreeable; is not coagulated by diluted acids or by alcohol when pure; but when acted on by alkalies, it is easily coagulated by these substances: The precise differences between serum, mucus, and pus, however, are not yet sufficiently ascertained. Its specific gravity is greater than that of water; it is not readily diffused in cold water, though in warm it is; it does not readily putrefy.

Pus is distinguished, 1. From chyle, by its not coagulating on exposure to the air, and a high temperature, and by its globules being larger:

2. From milk, by the globules being more numerous, though nearly of the same size; pus does not coagulate by runnet, milk does; milk contains oil and sugar, which pus does not:

3. From pancreatic juice, by the globules of pus being larger:

4. From the discharge of ill conditioned sores, by the flaky matter which that discharge contains:

5. From that of blisters, by the latter containing neither flakes nor globules.

6. From mucus, by the properties peculiar to pus, above enumerated; when mucus is formed in cavities, to which the air is not admitted, it is hea-

* Philip. p. 41.

vier than water; and even if it is formed in contact with the air, it becomes heavier, if allowed to become dense by stagnation and the absorption of its more fluid parts. Mucus expectorated in the morning is often heavier than water; and if pus be mingled with air, it swims.* Mucus when mingled with water gives to it an appearance of stringy portions of substance floating through it; pus renders water uniformly turbid; sulphuric acid dissolves mucus more readily than pus; if water be added to these solutions, the mucus swims through it in flakes, whilst the pus falls to the bottom: Caustic potash dissolves both pus and mucus; when water is added, the pus falls to the bottom, but the mucus is not separated.†

The formation of healthy pus, such as is above described, is attended with feelings more or less comfortable in the general system, natural secretions, skin, and look of the countenance; all general causes, which have a tendency to derange the system, affect the state of this fluid; thus, Mr. Hunter observed that a sudden change in the air produced instead of pus a layer of coagulable lymph, like melted tallow, adhering closely to the surface of sores: The more distant the sore is from the heart, the more likely is it to degenerate in its qualities; and the more pure it is, the less it erodes the animal solids; pure pus has no effect in this respect:

Diet has a great effect upon the character of pus; thus a moderate diet in a healthy system preserves its healthy qualities; reduce it, and it becomes serous, bloody, as the weakness increases: A diet too stimulating renders it bloody, sanious also in proportion as it is increased; other causes, as the state of the air, the mind, produce changes in it.‡ C.

5. The last and the most formidable of all the terminations of inflammation is sloughing, *sphacelus*, gangrene, or mortification, which are only different *degrees* of the same morbid condition. This happens, first, from the excessive violence of the first stage of inflammation, rendering it impossible for the vessels to restore themselves by any kind or degree of effusion. But as the tendency to gangrene often shows itself early, and without any particular violence of the first stage, it must be ascribed, secondly, to a *septic* tendency in the disease itself, as in the case of plague. The malignity of that contagion so overpowers the nervous system, that the vessels of the inflamed part are unable to resist the shock of the disease, and the part itself dies. Thirdly, the disposition to gangrene is, in many instances, independent both of the *nature* and of the *violence* of the inflammation, and is referable simply to the weakness of the patient's habit, which is such as to be unable to oppose resistance even to a mild attack. The symptoms of internal gangrene are:—1. The sudden cessation of pain. 2. A sinking and irregular pulse. 3. A change in the expression of countenance from that of febrile anxiety to exhaustion. 4. Delirium.

When the gangrene is external the part becomes yellow, then greenish, then of a livid hue, the cuticle separates and forms blisters; the part becomes less tense, swelled and hard, with a sense of crepitus on touching it: It is then

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* Philip, p. 39–40. † Cooper.
‡ Philip. on feb. dis. p. 39, 40, vol. 2.

said to be in a gangrenous state, and when it becomes completely black, without feeling or heat, it is denominated sphacelus.

When it is not attended with any discharge, it is called the dry gangrene, or necrosis: Internal gangrene is always fatal; when external, it is often so: Internal gangrene often kills by hæmorrhage from the opening of a large blood-vessel: When it is external, the means are more easily applied, and therefore they are more frequently successful; Sometimes the patients feel themselves quite well, on the coming on of gangrene: and sometimes it takes place without a cessation of pain.* C.

It remains to be stated, that several of these terminations of inflammation may be going on at the same time. Thus a mucous membrane may throw out a muco-purulent fluid. Flakes of coagulable lymph may float in the serum which an inflamed peritonæum has thrown out. The destruction of the part may be gradual and partial, and it is then eaten away by sloughy, or what has been called *phagedænic* ulceration.

If the pain, inflammation, and derangement of function and general fever be unusually obstinate, suppuration is generally the result: if very violent, sphacelus; Some organs, as the lungs and liver, are more subject to suppuration; others, as the stomach and intestines, to gangrene: However, sometimes there is violent inflammation in the stomach without vomiting or pain; even the heart is said by Morgagni, to have been inflammed without either pain or injury of function;† the same also takes place in the intestines and the brain. C.

Proceeding next to investigate the causes of inflammation, I shall first direct my attention to the circumstances which predispose to internal inflammation; and shall then point out the principal exciting causes of that state of disease.

PREDISPOSITION TO INFLAMMATION.

Inflammatory affections occur in all climates, and to all ages, temperaments, and conditions of body; and there is consequently no small difficulty in determining the true nature of the *diathesis phlogistica*, or that particular state of body in which inflammatory action is most easily lighted up. Dr. Cullen states, that the inflammatory diathesis chiefly prevails in systems of the greatest vigour. A full habit of body, a plethoric state of vessels, and *tension of fibre*, are the terms usually employed to express the state of the system, when predisposed to acute inflammation. It cannot be disputed, that in such habits we often meet with genuine inflammatory diseases; but the student must bear in mind that this is neither the only state of body in which they occur, nor is it even the most common. He will find, that when the constitution is *below par*, when it has been weakened by previous diseases, by low living, by anxiety of mind, by excessive bodily fatigue, continued for a long period of time, inflammation of the most acute kind is often excited, which runs as rapid a

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* Philip, p. 59, vol. ii. † Ibid.

course, and is attended with symptoms as violent, as inflammation occurring in persons full of blood, and of the most robust habit. The state of *weakness* then, of *irritability*, and of *atony*, is at least as favourable to the development of inflammation as that of *plethora* and *tension*. The state intermediate between these two is that which affords the surest preservative against the attack, not only of inflammatory, but of every other description of disorder. To that kind of inflammation which occurs in robust habits, the term *entonic* has been applied; *atonic* to that which takes place in a reduced state of the system. As expressive of a pathological principle, these terms are not objectionable; but the student must remember that they are inapplicable in *practice*, inasmuch as the several kinds of inflammation are to be treated on the same general principles. It is only with reference to prognosis, and the *extent* to which measures of depletion are to be pushed, that the study of the predisposition to inflammation is practically useful.

CAUSES OF INTERNAL INFLAMMATION.

With respect to the *exciting* causes of internal inflammation, it may first be stated, that occasionally we can form no conjecture as to the true cause of the complaint; but at other times we can define it with considerable certainty; and among the most important causes of internal inflammation will be found the following;—mechanical and chemical irritants; cold; a peculiar habit of body, formerly characterized as a depraved state of the blood and humours; the presence of a morbid poison; contagion and metastasis.

MECHANICAL AND CHEMICAL IRRITANTS.

The phrenitis of infants has been traced to the irritation of teething; gastritis to poison; enteritis to the presence of hardened fæces; nephritis to calculus in the kidney; ophthalmia to dust and sand; erysipelas to leech-bites, or the distension of the skin from dropsy.

COLD.

2. Cold is the most important of all the exciting causes of internal inflammation. There is scarcely any form of it which does not occasionally owe its origin to cold; and many inflammatory affections, as rheumatism and pleurisy, have no other cause of the smallest practical importance. The period of time that elapses between the application of cold and the occurrence of inflammatory symptoms is subject to great variety. In the case of sore throat, it often follows in the course of a few hours. In that of acute rheumatism, a week, or even a fortnight, has been known to elapse. What the circumstances are which direct the inflammation upon one organ or structure rather than another, may be

gathered, to a certain extent, from what has already been stated when treating of fever (page 77). In what *manner* cold operates as the cause of internal inflammation, has been a constant subject of inquiry with all pathological writers, but it is still involved in the greatest obscurity.

MORBID STATE OF THE HUMOURS.

3. Some forms of inflammation, which to a superficial observer might appear to arise without any assignable cause, have their origin in a peculiar state of body, the nature of which is not always understood, but which the older physicians supposed to consist in some *morbid state of the fluids or humours.* This piece of pathology is exemplified in the phenomena of gout; in the inflammation of absorbent glands occurring in scrofulous children on the approach of winter; and in the pustular eruptions, called *acne*, to which young persons are subject about the age of puberty. The mere presence of *fever* unquestionably leads to local inflammation; and hence it is, that in the progress of typhus, thoracic or abdominal inflammations so frequently supervene.

MORBID POISON.

4. The existence of a morbid poison in the system is a frequent occasion of internal inflammation. This principle we have already had ample opportunities of illustrating in the phenomena of the plague, small-pox, measles and the other exanthemata. It is equally exemplified in those of secondary syphilis, where the inflammation of the fauces, or of the iris, or of the joints, is obviously attributable to the presence of a morbid poison. The bite of the rattlesnake excites a peculiar kind of inflammation in the cellular membrane. Anatomists frequently suffer from the absorption of matter formed in the course of disease, especially of *acute* disease, such as peritonitis. In irritable habits this induces not merely inflammation of the glands and cellular membrane, but also of the pleura and peritonæum, often of the most acute and dangerous kind. Closely allied to this, in a pathological view, is the important but well-ascertained fact of the origin of many inflammatory affections from *contagion.* There is a species of contagious catarrh. Two species of cynanche are contagious. There is a contagious form of ophthalmia. Erysipelas is contagious under certain circumstances; so in all probability is dysentery. There is reason to suspect that one of the forms of peritonæal inflammation is occasionally propagated in the same way.

METASTASIS.

5. The last cause of internal inflammation which it will be necessary to notice in this general view of the subject, is *metas-*

tasis, or the translation of inflammation from one organ or structure to another. This is a very curious point in pathology, sufficiently established indeed as a matter of fact, but the reasonings concerning which are hitherto very obscure and imperfect. It is exemplified in the ophthalmia which succeeds gonorrhœa; in the inflammation of the testicle which succeeds the mumps; in the inflammation of the pericardium which succeeds rheumatism; in the inflammation of the brain which succeeds erysipelas of the face. In what manner the metastasis is effected has never yet been developed. It appears, however, that to *sympathy from similarity of structure* something may be referred; for in most cases of metastasis, it will be found that the structures primarily and secondarily affected have an affinity to each other.

In forming an estimate of the degree of danger in any case of internal inflammation, the student will keep chiefly in view the *nature of the organ attacked*, the *strength of the patient's constitution*, and the *length of previous illness*. Inflammations which arise suddenly and unexpectedly, occur for the most part in structures not essential to life, and are comparatively of little danger. Of this kind are inflammations of the pleura, of the tonsils, of the joints, and of the testicle. On the other hand, all those inflammations which are preceded by a long course of previous languor and ill health, occur in organs which are essentially necessary to life—such as the larynx, the pericardium, the bowels or the brain, and these are attended with the utmost danger. Attention therefore to the previous history of the patient is an indispensable step towards forming a just notion of the degree of danger, as well as of the necessity that may exist for prompt and active remedies.

CHAPTER II.

GENERAL DOCTRINE OF INFLAMMATION (CONTINUED).

Varieties of Inflammation.—From the situation and function of the part affected.—From Differences of Texture.—By whom first investigated.—Inflammation of Cellular Membrane and Parenchyma.—Of Serous Membrane.—Of Mucous Membrane.—Of the Skin.—Of Fibrous Membrane.—Varieties of Inflammation from Differences of Cause.—Theories of Inflammation.—Agency of Blood-vessels.—Of Nerves.—Question as to Differences in the Nature of Inflammatory Action.—General System of Treatment in Acute Inflammation.—In the states of Suppuration and Gangrene.

VARIETIES OF INFLAMMATION.

The study of the varieties of internal inflammation is no less important, in a practical as well as pathological point of view, than that of the great features of *resemblance* which all inflammations bear. Some of these have been long known to, and amply described by medical writers. Others have only attracted attention in the course of the last twenty or thirty years, and are not yet described with that accuracy of which the subject is susceptible, and which, from its immediate application to practice, it deserves. The specific distinctions among inflammations may be reduced to the three following:—1. The situation and function of the part inflamed. 2. The structure of the part inflamed. 3. The exciting cause.

FROM THE SITUATION AND FUNCTION OF THE PART AFFECTED.

1. The first source of variety in inflammatory affections is the situation and function of the organ inflamed. This is an obvious practical distinction; and it was accordingly noticed by all the oldest writers on physic. It is but of small importance, however, in a pathological view; for an organ is composed of different parts or textures, and each of these is liable to an inflammation which exhibits some peculiarities. Though on common occasions therefore it is sufficient to speak of inflammation

of the eye, or of the lungs, or of the bowels, yet in a scientific inquiry, it is necessary to be more precise, and to speak of inflammation of the conjunctiva, or of the iris, or of the tarsi; or to mark a distinction in the other cases by the terms, pleurisy, peripneumony, inflammation of the peritonæum, or of the mucous membrane of the intestines.

FROM DIFFERENCES OF TEXTURE.

2. The second, and by far the most important of all the sources of distinction among inflammations, is to be found in the structure of the part inflamed. Every part of an animal body, the cuticle and hair excepted, is subject to inflammation, and according to its structure, is inflammation occuring in it, modified both in symptoms and termination. It is an important and well-ascertained fact, that inflammation, in by far the larger proportion of cases, is confined to one texture, that it spreads along that one without affecting other contiguous textures; and that almost all extensions of it from one tissue to another are to be viewed as casual exceptions to a general law. For a long time this subject was either altogether overlooked, or but very slightly attended to by pathologists. Dr. Carmichael Smyth has unquestionably the merit of being the first who thought deeply, and wrote expressly upon it.* The views which he took of this great question are highly ingenious, extensive, and accurate. Subsequent observation, indeed, has corrected some, and enlarged others; but, upon the whole, they may be considered as constituting the basis of all our reasonings concerning the varieties of inflammation. John Hunter and Bichat pursued the same track of inquiry. It was the fault of the latter author that he perhaps *refined* rather too much upon it.

Physiologists reduce the fundamental textures of the body to five:—*viz.* cellular membrane, serous membrane, mucous membrane, skin, and fibrous membrane; and accordingly, there are five varieties of inflammation founded on peculiarity of structure: *viz.* phlegmonous, serous, mucous, erysipelatous, and rheumatic. A very brief sketch of the distinguishing characters of each of these forms of inflammation is all that is consistent with the plan of this work.

INFLAMMATION OF CELLULAR MEMBRANE AND PARENCHYMA.

1. That texture of the body which is the most generally diffused is cellular membrane, under which head physiologists include, not merely the membrane strictly so called, but the pa-

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* Vide "Medical Communications," vol. ii. page 168. London, 1788.

renchyma of the different solid viscera and glands, which consist of cellular membrane connecting a congeries of minute blood vessels and nerves. The inflammation of cellular membrane is called phlegmonous or *common* inflammation, and its peculiarities are probably referable to the lax texture of the part, and the size of its arteries. Phlegmonous inflammation is distinguished by the great swelling which attends it, by its throbbing pain, and by its tendency to circumscribe itself and ultimately to form *abscess.* The process by which phlegmonous inflammation is circumscribed appears to consist in the effusion of coagulable lymph, uniting the cells together, and becoming afterwards the walls of the abscess. To this order of inflammations belong peripneumony, cynanche parotidœa, nephritis, hepatitis, and some others. Phlegmonous inflammation which terminates by sloughing is called *carbuncle.*

In particular habits of body, and under circumstances not always well understood, cellular membrane inflames without showing any disposition to circumscribe itself. This constitutes what has been called *diffuse cellular inflammation,* which has lately attracted much attention from pathological writers.* It occurs principally in debilitated states of body, or from some unusual *malignity* in the exciting cause.

Carbuncle is a sloughing phlegmonous abscess, which occurs in an irritable state of the system from excessive stimulation, excesses in eating and drinking, and more particularly where the system has been debilitated by age: It is a symptom in the plague and other fevers.

OF SEROUS MEMBRANE.

2. Serous or diaphanous membranes are distinguished by a degree of transparency, by their firm and close texture, and by their function—the secretion of a serous fluid. The great serous membranes of the body are the tunica arachnoides, the pleura, pericardium, and peritonæum. Though possessed of little sensibility in the healthy state, these membranes are the seat of acute pain when inflamed. Lancinating pain, therefore, is the first character of *serous inflammation.* It is attended by a *hard* and *wiry* pulse, and a remarkable whiteness of the tongue, but for the most part without corresponding febrile debility. The peculiar terminations of this variety of inflammation are, the exudation of coagulable lymph forming præternatural adhesions, —the effusion of serum into the cavities lined by the membranes, forming dropsy;—and occasionally the secretion of pus. It was

* See a valuable paper, by Dr. Duncan, junior, in the first volume of the Transactions of the Medico-Chirurgical Society of Edinburgh.

at one time a matter of doubt whether pus could be formed, except by the sides of an abscess, or by an ulcerated surface; but it is now well understood, that both serous and mucous membranes in a state of inflammation occasionally throw out true purulent matter.

OF MUCOUS MEMBRANE.

3. The mucous membranes are those which line the various passages and cavities of the body which have an external outlet. They secrete a mucus for the protection of their surface from the air, or the acrimony of the fluids which may come in contact with them. Their surface is *villous*, and interspersed with the orifices of glandular follicles. There are three great tracts of mucous membrane,—those, viz. of the nose, larynx, and bronchia; of the mouth, stomach, and intestines; of the urethra and vagina.

When a mucous membrane inflames, its natural secretion either ceases, or becomes depraved, appearing thin, acrid, *puriform*, or even purulent. It acquires an increase of irritability; but the pain which is present is slight in comparison with that experienced from the inflammation of a serous membrane. The fever which attends it is, in like manner, seldom of so acute a kind, but it is sometimes accompanied with a remarkable degree of *debility*, which continues through a protracted period of convalescence. In respect of termination, a curious difference exists in the different tracts of mucous membrane, attributable probably to some peculiarity in their anatomical structure. The intestinal tract is remarkably prone to ulceration, and the rapidity with which it runs into this state is worthy of note. The membrane lining the trachea throws out, during inflammation, coagulable lymph; that of the urethra, pus. These and other characters of *mucous inflammation* we shall afterwards illustrate more fully, when treating of ophthalmia, catarrh, bronchitis, and dysentery.

OF THE SKIN.

4. Closely allied to a mucous membrane, in point of texture and function, is the skin; and the inflammation of this structure is attended with some interesting peculiarities. The phenomena of small-pox prove that the skin is susceptible of phlegmonous inflammation; but the genuine inflammation of the skin has peculiar characters, which have acquired for it the name of erythematous, or more properly of *erysipelatous* inflammation. It is characterized, like phlegmon, by pain, heat, tension and redness; but instead of a tendency to circumscribe itself, its disposition is to spread; instead of abscess, it goes on to the formation of

vesicle; and it occurs, much more frequently than other kinds of inflammation, in weak, irritable, relaxed, and exhausted states of constitution.

The membrane lining the mouth and fauces being covered by a cuticle, may be considered as a continuation of the skin. It is equally susceptible of erysipelatous inflammation, leading, especially in children, to the formation of those vesicles known by the name of *aphthæ.* The inflammation produced by blisters, burns, and scalds, and the areolæ of small-pox and cow-pox, are instances of erysipelatous inflammation; closely allied to which also, are the eruptions of measles and scarlet fever. The true seat of the redness in all these cases is the vascular net-work called *rete mucosum*, the vessels of which in the healthy state do not carry red blood. In the facial capillary system, however, the *disposition* of these vessels to receive red blood is very great, as is manifest in the phenomena of blushing. On this principle we account for the fact, that the exanthematous eruptions begin about the face and neck; that erysipelas is so much more common and dangerous in the face than in any other part; and, as was formerly mentioned, that small-pox is most liable to become *confluent* on the face.

OF FIBROUS MEMBRANE.

5. The last structure which demands attention is that of *fibrous* membranes, a class of membranes whose physiological relations were first investigated by Bichat. It must be admitted, that in this arrangement there is some mixture of hypothesis, but still there appears to be a foundation for it in nature. Fibrous membranes have a dense structure, and they do not exhale. They have the periosteum for their base. The dura mater, tendinous and aponeurotic expansions, and capsular ligaments, come under his head. Synovial membranes are usually classed by physiologists with the serous, but in a *pathological* view they may without impropriety be arranged here.

Inflammation of fibrous membranes is commonly called arthritic, or *rheumatic inflammation*, the peculiarities of which have been very long known. It differs from common inflammation in several points. 1. It never terminates in abscess, or adhesion, or gangrene, though the local symptoms be ever so severe; but it is followed by gelatinous exudation, or earthy or saline depositions about the sheaths of tendons, and the ends of bones, impeding motion in the parts. 2. It is generally slower in its progress than the inflammation of other structures. 3. It has a remarkable tendency to sudden shiftings, or metastases. 4. The accompanying fever has a peculiar character, which will hereafter be pointed out: the functions of the brain, for instance, are never affected in it. 5. It rarely proves fatal.

The synovial membranes, classed by the author under this head, differ materially from the ligaments, in being highly susceptible of inflammation, and suppuration; in scrofulous persons, particularly, these membranes are liable to become inflamed, and the cartilages which they cover are absorbed by ulceration, whilst the ligaments surrounding the joint are thickened, producing great enlargement of the joint:

The inflammation of the fasciæ is always severe; Thus, if from any cause the fascia lata becomes inflamed, the constitutional reaction is always considerable; it is sometimes mistaken for erysipelas, from the irritation which it communicates to the skin;* When inflammation is seated under the sheaths of the tendons, or the fasciæ, which cover the palms of the hands and soles of the feet, the pus formed upon them cannot get out, and from the distension travels from one part to another, under these membranes, producing excessive pain and constitutional irritation and fever. C.

VARIETIES OF INFLAMMATION FROM DIFFERENCES OF CAUSE.

Such are the chief structures of the body, and such the respective characters of the inflammation which attacks them. It remains to be stated, that the exciting causes of inflammation exert a considerable influence over the character of the disease. Thus inflammation of the tunica conjunctiva exhibits different appearances, according as it originates from cold, or from contagion. Inflammation of the tonsils has a different aspect when it arises from the presence of the venereal virus in the system, from that which it assumes when it is owing to cold, or the contagion of scarlatina. The practitioner of experience can indeed often ascertain the cause, by observing the *appearances* of the disease.

THEORIES OF INFLAMMATION.

Many theories of inflammation have been proposed; many attempts, that is to say, have been made to explain the precise nature of inflammatory action. But inflammation is an action peculiar to life. It is on a par with secretion and absorption; and if we cannot unfold the nature of the healthy vital actions, it is not surprising that pathologists have failed in explaining those which occur in disease. It is pretty well agreed, that inflammation is a morbid action of capillary vessels. This portion of the great circulating system appears to act a very important part in almost all the operations of the animal body. The capillaries are probably the organs mainly concerned in secretion and the growth of parts, and possibly also in absorption; but the whole subject of the functions of the capillary system is exceedingly obscure. Bichat appears to have considered it as altogether beyond our reach. Uninfluenced by these considerations, many modern pathologists have attempted to define accurately the state of the capillary vessels during inflammation. All are agreed, that under such cir-

* Cooper.

cumstances the blood-vessels of the part carry an unusual proportion of blood; but some attach to this the notion of an *increased* action of their coats; others imagine, that in *some* part at least of their course, there is a spasmodic constriction; while a third class of pathologists maintain, that during inflammation the action of capillary vessels is *diminished*. Into the merits of these different theories I have no intention to enter, after the opinion which I have expressed as to the almost impenetrable obscurity of the subject. The theory of *increased action* of the capillaries is, upon the whole, that which is likely to prove the most useful guide in practice; and, though by no means free from objections, will, with these reservations, be employed hereafter, wherever the nature of the subject may lead to theoretical discussions.

AGENCY OF BLOOD-VESSELS AND NERVES.

In the common theories of inflammation, every thing is attributed to the agency of blood-vessels. It is a matter, however, deserving of some inquiry, how far the nerves are concerned in inflammatory action. Several circumstances tend to the notion, that a buffy state of the blood is a phenomenon depending on nervous influence; but it would be out of place to enter upon the consideration of such obscure and difficult questions here. Nor do these comprise the only points concerning inflammation on which pathologists have differed. A doubt has been expressed, whether differences of anatomical structure are sufficient to explain all the diversities which we observe in inflammatory action. It has been suggested, that is to say, that there may be differences in the *nature* of inflammatory action; that the same set of vessels may at one time be in a state of phlegmonous, and at another erysipelatous, or rheumatic inflammation. This refinement, however, appears to be unnecessary.

The general principles of treatment in inflammation admit of being laid down with some accuracy; but they are of course varied by many circumstances, among which the most important are, the period or stage of the disease; the habit of body; the exciting cause; and the structure of the part inflamed.

TREATMENT.

1. The indications of cure in the early periods of internal inflammation are, first, to unload the vessels; secondly, to lessen the *vis a tergo*, the force of the heart's action; thirdly, to excite the vessels to a more healthy action; and, fourthly, to alter, if possible, the inflammatory condition of the blood. These indications are to be fulfilled by the nicely-regulated employment of blood-letting, general and local; purging, refrigerant medicines,

and the local application of cold; occasionally by blisters and warm fomentations; and, in a few cases, by stimulants and tonics. The choice of the particular means best adapted to the different inflammatory affections of the body will be a principal object of inquiry hereafter.

Inflammatory diseases differ from common remittent and intermittent fevers; 1. in being less complicated in their nature; 2. in being more susceptible of relief from bleeding; and requiring the more cautious use of stimuli.

3. In remittent fevers, too much depletion produces the low or typhous state; in inflammatory diseases, gangrene or local chronic diseases are the result, particularly in the weak or the aged.

In some, as angina maligna, gangrene appears rapidly; in others, as pleurisy, suppuration is the more common effect; in rheumatism, the effusion of serum is met with more frequently, and suppuration hardly or ever takes place: whereas, in remittents, though each of these terminations are occasionally met with, yet, generally, particularly in the United States, they are rare, and are not to be considered as consequences to be so regularly expected, as in the phlegmasiæ.

4. Inflammatory diseases are less subject to the intermittent form: The chill at the beginning is shorter and more rarely appears in the course of the disease than in general fevers.

5. They are confined to no climate of the globe; some, however, as those of the lungs, pleurisy, peripneumony, consumption and rheumatism are found only in cold; others, as hepatitis, more generally in hot countries.

6. Like fevers, they are influenced by temperament of body, by the atmosphere, by plethora, by habits of life, by the state of the mind, &c.; but contagion has little to do with their propagation: they do not at first arise from it, with but few exceptions, and with regard to some of these it is doubtful whether even they arise from contagion:

Thus, phrenzy, pleurisy, rheumatism, and some inflammations of the viscera are not even suspected of originating in this manner, though ophthalmia, dysentery and pulmonary consumption, as they are seated in surfaces secreting mucus, have been supposed to be communicated by it, by the highest authorities in medicine.

7. The tendency of inflammatory diseases to a crisis or to health is much less than in common remittent fevers of ordinary intensity; thus, pleurisies end in suppuration, rheumatism becomes chronic, phrenitis ends in effusion, in abscess, gangrene of the brain or death, from the violence of the action; whereas in common fevers nature may do all and the physician sometimes nothing, and the sick recover.

In treating them, a professor of the expectant system of medicine can be tolerated, and will receive patronage; in inflammatory diseases, that system would kill the patient and disgrace the physician: The means in inflammatory diseases must be well appointed, administered with energy and promptitude; if they are not, death or a miserable protracted existence are often the consequences.

It is true, that remittents sometimes exhibit great mortality, as in the plague and yellow fever; the same, also, is true sometimes of inflammatory diseases; we hear of pleurisies in very cold seasons, and of inflammations of the liver in hot climates, which are almost beyond the control of medicine; in these cases the morbific causes have been applied in the highest intensity; but as a general rule, in consequence of the local inflammations attending the phlegmasiæ ending in suppuration, gangrene, ulceration, effusion, &c. which in vital organs are necessarily fatal, remittents are more likely to end in recovery, because they have not so generally these local terminations. These, however, are only general positions, liable to be varied by many exceptions: Thus, the phlegmasiæ are often by the occurrence of hot weather rendered bilious, and remittents in the autumn, on the appearance of cold weather, become pleuritic, rheumatic, &c. so that their tendency to a crisis or recovery will be influenced by these

circumstances, according as the one or the other preponderates. The general principles laid down by the author on the subject of fever will here throw light upon the subject; and a proper consideration of the causes which influence the type will assist in determining the judgment.

8. In the phlegmasiæ, the local affection is considered in the treatment, as the prominent evil to be overcome; in idiopathic fevers, the fever is the principal: thus, in pleurisy, we bleed till the pain in the side disappears, regarding venesection as the polar star of our course; in fever, as for instance, in intermittents combined with apoplexy or coma, the disease must be cured through the fever, for which the bark is the remedy; for large bleedings increase, by the debility they produce, the tendency to the return of the fever; it must, however, be used, but with caution in this complication; whereas, if apoplexy or coma, with high arterial action, proceed from any other cause, the most copious venesection, uncontrolled by any collateral consideration, must be practised as indispensable.

9. The phlegmasiæ do not admit of the application of cold to the surface, as idiopathic fevers; though the temperature of the room must be reduced, yet, as they are often produced by cold, the affusion of water is not practised in these diseases.

10. Bleeding is the principal remedy in these affections; and its quantity is regulated by the hardness of the pulse and the disappearance of pain from the part inflamed; it can be drawn in greater quantities than in common fevers, because simple debility, and not typhus, as in fever, is the result of excessive depletion in this mode.

Sometimes the violence of the inflammation will produce gangrene, in a few hours; blood must then be abstracted at once, and in great quantities; and if the pulse from the first be low and weak, it furnishes no objection to bleeding, more particularly if the inflammation be seated in the brain, the heart, the stomach, or intestines. These remarks, however, apply to persons in full health; to those who are weak, though bleeding is still the principal remedy, yet it must be taken in small quantities, and drawn locally.

11. With regard to the use of the other evacuations of emetics and purgatives it may be observed, in certain inflammations, as that of the brain, emetics are not to be used, from the danger of producing apoplexy; purgatives, on the contrary, in that affection, by unloading the vessels, deplete most successfully that part of the system.

In inflammation of the lungs, fauces, and in the different species of cynanche, emetics are useful; in that of the trachea, indispensable; In general, where they are proper they may be given in nauseating doses, so as to debilitate the arteries effectually, and keep them in that state till the secretions are fairly restored, when the blood-vessels come down to their natural state; for this purpose, small doses of calomel, followed by some resinous purgative, as advised below, are very useful. In inflammation of the stomach emetics are dangerous, and inadmissible in all cases; of the bowels, liver, bladder, from the agitation they produce, they are also hurtful: When they excite only nausea they may, by debilitating the sanguiferous system, be useful in the three last cases. Purgatives are beneficial in all the phlegmasiæ; even to unload the bowels by mild diluents of a cathartic tendency in enteritis would be valuable, where the active purgative of jalap, &c. might be dangerous: Venesection must be our sheet anchor here: Sometimes it is combined successfully with opium in this variety: of this, more will be said hereafter. In general, in other inflammations, calomel at night, followed by senna and salts, or calomel and jalap, given in the dose of 10 grs. of each, so as to excite the secretions of the liver and skin by the former, and evacuate the bowels by the latter, has a fine effect; the withdrawal of the blood to the bowels from the inflamed part by the irritation of the purge, and the evacuation of fluid from the surface of the intestines, depletes in the most decided and beneficial manner: Astley Cooper recommends to fulfil these indications, one grain of calomel, with four of cathartic extract; or two grs. of blue pill, with three of compound extract of colo-

cynth; or infusion of senna with sulphate of magnesia: In children, he recommends calomel and rhubarb, glysters and the warm bath.

12. By keeping the bowels free by the above plan, the sudorific effect of medicine can easily be secured; Six grains of tartar emetic dissolved in a quart of water, and given in the dose of a wine glass full every two hours is an excellent sudorific: It vomits, given in the same dose every ten or fifteen minutes, and it purges when given every hour. Combined with calomel in the dose of four or five grains at night, followed by this solution next day, or after the calomel operates, it has an excellent effect: The compound powder of ipecacuanha is also valuable: The warm bath or pediluvium assists the operation: The Dover's powder with calomel often quiets the irritable, hard, jumping pulsation of the arteries after bleeding and aperients.*

With regard to the usual means of controlling the blood-vessels, we proceed to make a few remarks:

The local means are cupping glasses or leeches, promoting the flow of blood by the application of cloths wrung out of warm water; Leeches can be applied when the parts, whether internal or external, are so painful, that cups cannot be borne. The cupping glasses are often applied without scarifying the skin; they divert the blood from internal parts in a state of inflammation; a common tea cup, or tumbler answers very well: The copiousness of the discharge of blood, after applying leeches, is an objection to their use, as also the uncertainty of the quantity lost: A little lint applied on the surface will generally be sufficient to arrest any flow of blood: The inflammation if seated in the head may be abated by bleeding from the temporal artery or the jugular vein, or finally from the arm; It should be continued till the vis a tergo is much diminished, and in order to effect this it is necessary to take it rapidly, and in an erect position, as syncope then takes place more suddenly, and the inflammation is often completely suspended: It may be repeated and combined with local bleeding, if the case require it; Parts essential to life, of course demand a more energetic treatment. With regard to the time, &c. quantity to be taken, &c., the directions given in p. 92. et seq. should be attended to. In general 20 oz. will be enough for a first bleeding in a stout and strong man; at the second, less.

The hardness and tensity of the pulse, and not its frequency, furnish the indications for bleeding in the phlegmasiæ; the hardest pulse is that, which occurs in inflammation of the heart; in that of the brain, next; in that of the stomach and intestines, it is so small as scarcely to be discernible. This is subject to great exceptions. The oppressed pulse often occurs in both: The same, it is stated, has also been observed in peritoneal inflammation: Quickness of pulse is a sign of irritability, which will be increased by bleeding; therefore, this sign alone in inflammatory diseases is not sufficient to justify bleeding; with hardness, it is: On the subject of the buffy and cupped state of the blood, Cooper states he found it in a case of scurvy; it, therefore, is not always a sign of the necessity of bleeding.†

If the inflammation is merely local, of course such extensive depletion will not be necessary. If the inflammation is kept up by extraneous irritation it will be necessary to remove the foreign body; then the above depletion will be more effectual: clysters of tobacco may be used with success to lessen arterial action: they operate by producing great weakness. A half a pint of boiling water to ℥i. of tobacco is the proper proportion. Dr. Parry of Bath has proposed to cure inflammation by suppressing the flow of blood by pressure on the arteries going to a part: and he thinks he has succeeded in lessening it by this means. Inflammation on the same principle when it occurs in the larger joints has been cured by tying up the principal artery going to the limb; This plan was proposed by Dr. Mott of New York; and Dr. Rogers of that city has succeeded in curing a case of inflammation of the knee joint by it. C.

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* A. Cooper's Lectures, vol. i. p. 69. Lond. 1827.

† A. Cooper's Lectures, p. 60-1. vol. i. Lond. 1824.

1. When suppuration is established, moderate evacuations may sometimes be proper, and even rendered necessary by the urgency of a particular symptom; but the mischief being now done, the object of the practitioner is rather to support the strength of the patient, than to risk, by further depletion, its complete exhaustion. A nourishing diet, therefore, and tonic medicines will often be requisite, in conjunction with such means as diminish local action, and lessen the quantity of purulent secretion. Internal gangrene being so rarely an object of treatment by the physician, it is only necessary to remark in this place, that it requires the exhibition of wine and other cordials. For the treatment of external gangrene, and for the treatment of external inflammation generally, I must refer to works on surgery, where this subject is fully treated; it being the most important of all those which occupy the attention of the surgeon.

2. The treatment of internal inflammation is to be regulated, in some degree, by a consideration of the habit of body in which it occurs. *Entonic* inflammation demands blood-letting from the general system, full purging, and active measures of depletion. Inflammation occurring in *weakened* habits is, in many cases, more effectually relieved by the *local* abstraction of blood, by blisters and such other means as lessen the action of the part, without impairing that strength of the general system which is so indispensable for the repair of injury.

3. The treatment of internal inflammation is modified in the third place by the nature of the exciting cause. Scrofulous inflammation of the absorbent glands, and inflammation of the periosteum or fauces from the venereal virus, require a peculiar treatment, adapted to the circumstances of each case. Tonics in the one, and mercury in the other, must be superadded to the general system of management already alluded to.

4. To a certain degree, the structure of the part inflamed affects the treatment. Inflammation of a serous membrane demands the copious and rapid abstraction of blood. That of mucous membrane does not bear the same extent of evacuation, nor does it so often require it. Erysipelatous inflammation is often successfully treated by bark and acids. Rheumatic inflammation is under the control of certain drugs, which have comparatively but little effect upon common inflammation; colchicum, for instance, mercury, and opium.

The convalescence from all the severer kinds of inflammation, such as inflammation of the brain, lungs, larynx, or bowels, is very tedious, being often protracted for three or four months, and this, whether bleeding has been largely or sparingly employed. The system receives a shock from the occurrence of inflammation in any organ necessary to life, from which it recovers with great difficulty; nor does it appear that these subse-

quent efforts of nature can be at all assisted (as in the case of fever) by the employment of bitter or other tonic remedies.

Such are the general outlines of the management of acute inflammation, under its several modifications. The subject is as important as it is extensive; for in inflammatory diseases the value of medical treatment is more unequivocally manifested than in any other class of disorders, and the skill and resources of the physician are here put to their severest trial.

CHAPTER III.

CHRONIC INFLAMMATION.

Diversity of Structures affected by Chronic Inflammation.—Chronic Inflammation, primary and secondary.—State of the Constitution in this Affection.—Causes of primary Chronic Inflammation.—Its Nature and Seat.—Effects of Chronic Inflammation.—Thickening of Structure, Schirrus, Tumors, and Tubercle.—Chronic Suppuration.—Prevention and Treatment of Chronic Inflammation.

Chronic inflammation is a term frequently made use of; but I am not acquainted with any work in our language which may serve to point out the pathological considerations which it involves. On this account, though the subject is perhaps too obscure for investigation in an elementary work, I have thought it advisable to offer a few remarks concerning it; rather, indeed, with the idea of attracting the attention, than of satisfying the inquiries of the student.

DIVERSITY OF STRUCTURES AFFECTED BY CHRONIC INFLAMMATION.

Chronic inflammation occurs frequently, and in almost every variety of structure: in the lungs, where it lays the foundation of consumption; in the brain, liver, spleen, and kidney. All the serous and mucous membranes of the body are subject to it; and in many cases this proves a most formidable affection, as in chronic dysentery, and catarrhus senilis. The substance of muscle, and the different species of fibrous membrane, appear to be the seat of chronic inflammation in some forms of rheumatism. The skin is of all textures the least liable to chronic inflammation, unless, indeed, with some pathologists, we place in this class, lepra, psoriasis, and other varieties of chronic cutaneous disease. The same affection falls also within the observation of the surgeon. Gleet, inflammation of the prostate gland, scrofulous enlargements of absorbent glands, chronic ophthalmia, and ozæna (or the chronic inflammation and ulceration of the Schneiderian membrane), may be taken as instances.

PRIMARY AND SECONDARY.

Chronic inflammation is sometimes a primary, and at other times a secondary affection; that is to say, it succeeds acute inflammation; and this is the most common form in which it appears, witness gleet and dysentery. In other cases it begins almost imperceptibly, and its advances are slow, often exceedingly insidious, being unaccompanied by any symptoms which could betray, even to the experienced practitioner, the existence of such a disease. Nowhere is this better exemplified than in some forms of chronic peritonæal inflammation; but the same thing has been observed also in cases of chronic inflammation of the membranes of the brain, and even of the heart itself. In these instances, not only are there wanting all local symptoms of inflammatory action, but there are not even any constitutional symptoms; at least none of sufficient importance to attract attention. This, however, is rare; and chronic inflammation, both primary and secondary, exhibits for the most part local and constitutional symptoms, less indeed in degree, but the same in kind, with those which accompany acute inflammation. These vary, of course, with the part affected. Sometimes, as in chronic laryngitis, there are local symptoms, but no sensible affection of the constitution. When the general system is implicated, the symptoms are usually those of fever. The pulse is quickened; there is a white tongue, thirst, and some degree of restlessness. Occasionally, however, in a state of chronic inflammation, the tongue is clean, there is no thirst, but the pulse is feeble and languid, the extremities are cold, and the slightest exertion occasions fatigue, general uneasiness, and pain across the loins. All these symptoms mark a state, not of fever, but of atony and debility. The term *asthenia* has been applied with much propriety, by some pathologists, to express this state of the general system. Many of the protracted cases of bronchial inflammation, particularly those which occur in old people, exhibit, in the greatest perfection, the characters of *asthenic inflammation.*

CAUSES OF PRIMARY CHRONIC INFLAMMATION.

The causes of *primary* chronic inflammation are involved in great obscurity. There is reason to suspect that cold has sometimes induced it; or the long continuance of some mechanical irritation, as in the case of chronic inflammation of the brain, from spicula of bone; but it is seldom that we can attribute the disease to so obvious a cause. A scrofulous habit of body appears to favour the disposition to chronic inflammation, but it often occurs where it would be mere hypothesis to attribute it even to that obscure source.

NATURE AND SEAT.

The nature of that action of vessels in which chronic inflammation consists, has been long an object of research. By some, it has been defined to be that state of increased action of vessels, which is neither so far subdued as to tend to resolution, nor so violent as to form abscess; but this goes only a little way in explaining the difficulty. From the appearance of the eye in some cases of chronic ophthalmia, and from the effects of the *juvantia* and *lædentia* in this and many other instances of chronic inflammation, it would seem probable that a *relaxation* of vessels prevails, rather than any increase of their action. It must be confessed, however, that this object of inquiry is obscure; and perhaps the truth, if it could be obtained, of no practical application. In France, a doctrine obtains, that chronic inflammation has its seat in two distinct orders of vessels, *sanguiferous* and *lymphatic capillaries;* but as this piece of pathology has never been received in this country, it will not be necessary to inquire into its merits.

EFFECTS OF CHRONIC INFLAMMATION.

The effects of chronic inflammation vary with the texture of the part affected. A simple thickening of structure is a common appearance, both in serous, mucous, and cellular membranes. Sometimes the thickening assumes the form which has been called *tuberculated accretion.* At other times the part inflamed is converted into cartilage and bone. Instances of ossific deposition taking place in consequence of chronic inflammation occur in chronic laryngitis, chronic pleurisy, and chronic pericarditis. A further effect of chronic inflammation (confined however to serous membranes) is the extensive union of opposite surfaces. *Scirrhus* is generally accounted the effect of chronic inflammation in a glandular organ.

The origin of *tumours* in different structures, is a subject that has excited much attention among pathologists. In many cases it is presumed that their growth is referable to the same action of vessels by which all parts of the body are formed; but in other cases, there is reason to believe that they may have had their origin in a state of chronic inflammation of vessels. Closely allied to tumours are *tubercles;* but the views which are entertained by pathologists of the origin and nature of tubercle, will come better under discussion hereafter, when treating of pulmonary consumption.

The last effect of chronic inflammation which I shall notice is *suppuration*, and it is one of those which we have most frequent occasion to witness in practice. The fact of the formation of

purulent matter in cysts and other structures, without any evidences of previous inflammation, was well known to John Hunter, who had particular views of his own regarding it. But they are very unsatisfactory; and until further light is thrown upon the subject, it may not be improper to consider these collections of matter as the result of chronic inflammation.

To some, the subjects which have now been discussed may appear too indefinite and obscure to be legitimate objects of investigation, particularly in an elementary work. To this I would reply, in the energetic language of Bichat,* "that in explaining the animal œconomy, it is doing much to indicate analogies; to show the uniformity of an unknown phenomenon with another about which all the world are agreed." "In every branch of science," adds this author, "it would be well if the principle was thoroughly appreciated—that nature, greedy of her means, is prodigal of results; that a small number of causes everywhere preside over a multitude of effects, and that the greater part of those about which we are doubtful, are referable to the same principles with others which appear to us evident."

TREATMENT.

The treatment of chronic inflammation is very little understood. It is often said, that parts which have been much weakened, especially by large bleeding during the acute stage, are liable afterwards to fall into the state of chronic inflammation. The remark, however, is not of general application, and this form of disease is oftener attributable to a neglect of those vigorous measures which would have cut short the acute stage of inflammation at its commencement. Chronic inflammation is almost as much out of the control of medicine as acute inflammation is under it. Nature sometimes works a cure; but in many cases, more particularly of primary chronic inflammation, nothing is found effectual in checking the disease. The general system of treatment must depend upon the state of the constitution. Four plans of treatment have been advised, and each has been found serviceable under different circumstances.

1. Where fever is present, blood-letting, purging, and saline medicines, with a low diet, are to be recommended.

2. Where the pulse is feeble, and there is a decided loss of tone in the system, myrrh, benzoin, the balsam of copaiba, steel, and bark, are unquestionably useful.

3. Where the disease is purely local, it is best treated by leeches, blisters, and issues, upon the principle of counter-irritation.

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* Traité des Membranes, page 189.

4. Where these means fail, an *alterative* plan of treatment may be resorted to. This is done under the idea of giving a new action to the vessels. Upon this principle mercury is employed in the treatment of chronic hepatitis, alkalies in the scrofulous inflammation of absorbent glands, and sarsaparilla and guiacum in chronic rheumatism.

The plan of treating chronic inflammations by a slow and gradual action on the secretions, deserves more particular consideration than any other. Sir Astley Cooper considers, that in chronic diseases some of the secretions are suppressed, and upon their restoration depends our success: Whether the reappearance of the secretions is the cause or the effect of the cure, it is difficult to say. In chronic inflammation, he advises calomel and opium; the pilul. hydrargyr. comp. has in his opinion a more general action on the liver, intestines, and skin; and if the secretion of these organs be restored the local disease will disappear. This practice, which is nothing more nor less than the mercurial, so strenuously and generally recommended in this country, and more particularly by that excellent and great man, Dr. Rush, deserves to stand pre-eminent in all the curative processes in these diseases; it is however, particularly strengthened by the experience and practice of such a man as Sir Astley Cooper, as his attention has been confined more to diseases of a local bearing upon the system. Confirmed thus by ample experience, drawn from local and general sources, it cannot be too much prized: The forms in which it is given by Sir Astley Cooper are the oxymuriate of mercury, dissolved in nitrous ether, and combined with the tincture of bark or rhubarb or sarsaparilla, taking care that the mercury be not given to excess, as it tends to increase rather than diminish irritability: In children, Sir Astley recommends, in chronic diseases, the hydrargyr. cum creta and rhubarb, or one grain of the oxymuriate of mercury dissolved in an oz. of tincture of bark, and given in doses of from half a drachm to one drachm, twice a day, in water, according to the age of the patient: Calomel and rhubarb and the hydrargyrus cum creta and soda, are also considered as medicines of much value in the chronic disease of children:

If mercury be not advisable, rhubarb and carbonate of soda, or rhubarb, soda and columbo, given often, and in small doses, he recommends very much; they operate as aperients, improve the digestion and appetite without exciting great irritation.

CHAPTER IV.

LOCAL INFLAMMATION.

Phlegmonous Inflammation—Treatment—Abscess—Mortification, from a high grade of action—Carbuncle or Anthrax—Treatment—General Remarks on the Treatment of Mortification—Mortification from defect of Action—Treatment—Mortification from Cold—Hospital Gangrene—Treatment—Burns—Treatment—Chilblains—Treatment—Cancer or Scirrhus—Treatment—Scirrhus in the Testicle—of the Prostate Gland—Cancer of the lips, nose, &c., with their treatment—Paronychia—Periostitis—Inflamed Breast—Dentition.

PHLEGMONOUS INFLAMMATION.

This variety may be produced by any chemical or mechanical irritation, wounding, contusing or destroying the skin or cellular membrane, in which it is seated; increased action of the blood-vessels, as in plethora, is also a cause of it: The most common form is the boil, which is a conical, pointed, circumscribed red swelling, with heat and pain, and a whitish or livid pustule on the top, which is very sensible: It involves the skin and cellular membrane, and ends in the formation of pus, which is generally mixed with blood, is small in quantity, and seldom healthy: It is contained in a small cavity, formed by the agglutination of the plates of the cellular substance, when it is seated as low as that membrane; and which gradually tends to the surface and is discharged by a small opening.

Boils appear most commonly in children or young people, in whom they are sometimes attended with loss of appetite, spasms, and fever; they follow the small pox, or take place on the surfaces where blisters have been applied, and then evince an inflammatory state of the system, which may occur even in a debilitated state, and require the use of very active means to relieve them This frequently happens after small-pox, in which the continued use of mild but gentle cathartics is required to subdue this affection:

They are attended with fever when they are numerous, and more particularly when seated on the buttocks or in the arm pits, where they grow to a considerable size; In healthy and strong people, boils are regarded as of no consequence; but, as they vary in degree, from the most insignificant pustule to the most malignant carbuncle, it is of importance to notice them particularly; and as the same kind of inflammation, both in progress and result, takes place on the injuries occasioned by both mechanical and chemical irritants, as bullets, splinters, caustics, &c. it is necessary to consider particularly the qualities of system which they evolve.

When matter is formed in a phlegmon, which has been so large as to affect the system with fever, the throbbing pain in the tumor ceases; a constant numb coldness and weight of the part takes the place of the pain, and the swelling

instead of being tense is attended with fluctuation, on applying the fingers to it, shewing the presence of matter below; where the parts are soft, as in the abdomen, even though they should be deep seated, the existence of an abscess can be determined by a skilful touch; the symptoms of chills, night sweats, &c. are the most certain indications of the formation of matter, where the fluctuation cannot be felt:

In general, however, the tumor is small, does not affect the system with fever, and the suppuration is seldom complete, being generally mixed with blood and surrounded by a substance of a sloughy nature, which must be thrown off before the part heals up: The boil is an encysted tumor, and the bag containing the matter must be discharged before the part will heal.

TREATMENT.

With regard to its treatment, I have seen a leech applied in the forming stage, completely arrest it; and I have no doubt that by a sufficient number, as five or six, applied on the part, even when pretty far advanced and before the sac and the matter are formed completely, the disease might be generally stopped.

Cold succeeds sometimes in resolving local inflammation; one of the best lotions for producing it is an oz. of rectified spirits of wine and five ounces of water, as recommended by Astley Cooper. It should be applied by fine linen laid over the part, so that the evaporation may go on with facility:

Ice applied to the inflamed surface also answers well; it should not be permitted to touch it, as it irritates and is apt to produce gangrene.* The following applications also may be used for this purpose; linen dipped in a solution of sugar of lead, ℈ii. to the pint of water; or in ℥ss of muriate of ammonia, a gill of vinegar and as much water; or in the liquor of acetate of ammonia ℥ii. and brandy four ounces; or in camphorated spirits ℥i., vinegar ℥iii., and sugar of lead ℈i.; or in a simple solution of vinegar and salt, applied to it, and frequently renewed: Simple cold water, a solution of nitre, applied by linen cloths, or ether dropped upon the part, will also have a tendency to arrest its progress:

Some interesting facts are recorded on the subject of the prevention of suppuration, by the application of ice to an extensive wound of the brain and dura mater, and in a compound fracture of the leg, occurring in the practice of Drs. Johnson and Harrison, of Louisville:† Though the dura mater was extensively wounded, the process of healing went on in the most favourable manner, the undue action being kept down, preventing, it is probable, hernia cerebri in the wound of the brain, till the patient completely recovered.

An indolent hardness often remains behind, when it is resolved, and prevents a cure; for it frequently suppurates several times before this hardness is removed, which at last is effected by a free discharge of the matter.

When a boil appears on the face, to prevent the scar, it is important to discuss it: The above mentioned means are proper for this purpose, as also general bleeding, (which of course can only be advisable when the boil is large,) a low diet of whey and vegetables, without meat, fish or flesh of any kind, butter or eggs:

If there be fever, nitre in the dose of 15 grs. with one-sixth of a grain of tartar emetic in two table spoonfuls of water are to be taken every hour, or spiritus mindereri ℥i. with the one-eighth of a grain of tartrite of antimony, or the salt of tartar ℈i. taken in two tea spoonfuls of lemon juice or a table spoonful of vinegar in an effervescent state, and repeated every hour, promoting the perspiration at the same time by vinegar whey: The Dover's powder answers also a very good purpose: This depleting plan is more particularly

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* A. Cooper's Lectures, vol. i. p. 78. Lond. 1824.

† Phil. Month. Journal of Medicine and Surgery, for 1828.

valuable, when the suppuration threatens to be extensive and the inflammation runs high; the matter is always more healthy, if resolution cannot be effected, when the general action of the system is kept down.

The following applications, honey strongly acidulated with sulphuric acid, camphorated oil and alcohol, are also recommended, to promote resolution; they cannot be made after the leeches are applied, because they would irritate and inflame the tumor, and thus promote the suppuration.

When suppuration is inevitable, a bread and milk or linseed poultice, covered with lard, should be applied; a linseed poultice is made by pouring a pint and a half of warm water upon half a pound of linseed, till it becomes of the proper consistence, and adding a small quantity of sweet oil, to prevent it from hardening; A poultice of yest and oatmeal, or vinegar and oatmeal, is also recommended: Sir Astley Cooper recommends the poultice to be wet with a solution of a table spoonful of common salt to the pint of water, as the best application for promoting suppuration: If the suppuration is slow, from general debility, a compound plaster of galbanum, the emplast. thuris composit; adhesive plaster, the emplast. ammon. cum. hydrargyr; a poultice of onions, of garlic, or the soap cerate, may be used; the plasters just mentioned are more convenient, as they permit people to attend to their business:

Where the suppuration is slow, and evidently from the general system being below par, ammonia, bark, wine, a diet of mutton, beef and fowls, without gravies, pastry, or any indigestible food, should be given to support the action of the heart and arteries:

As soon as the tumor points sufficiently open it with a lancet, feel and press out the sloughs; and as soon as it begins to heal it should be dressed with simple cerate or fresh hog's lard spread upon linen: Mercurial plaster spread upon leather and applied to the part, removes the remaining hardness:

Sometimes, in debilitated subjects, after small-pox, measles, scrofula, lues venerea and other chronic diseases, indolent boils appear, which discharge a thin and badly maturated matter, and which on being fairly opened, throw off many sloughs before healing; they are treated in the same way as above, only with this difference, that gentle cathartics must be administered,* in order to rid the system of the disposition to form these inflammations.

TOOTH-ACHE.

Tooth-ache is almost always owing to an inflammation produced by caries of the tooth; as it aggravates other diseases and is always very painful, it becomes necessary to know how to stop it: Dropping alcohol, brandy or laudanum into the ear of the affected side, does it like a charm; also a few drops of oil of cloves applied to the hollow tooth by a small piece of cotton; the smoke of tobacco blown into the ear; a solution of alum in nitrous ether applied to the decayed surface of the tooth. These are palliatives. Extraction is the only certain remedy.

EAR-ACHE.

Ear-ache generally proceeds from inflammation, and is common in children: Leeches near the ear, a blister afterwards applied behind it, a poultice of onions put over it, or a clove of garlic put into it, will generally succeed in relieving it: Underwood describes it as sometimes spasmodic; it then returns at intervals, ceasing for a time between them. He recommends the juice of rue, or a little laudanum dropped into the ear:

ABSCESS.

Abscesses may be divided into such as are formed rapidly, and into those which are produced more slowly; the former has been called acute; the latter

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* Cooper.

chronic: in the first, about eighteen or twenty days is required for the formation of matter; in the second or chronic, it may be months; as, in the psoas abscess:

Acute abscesses are best treated by purgatives, to prevent costiveness; by opium, to keep down the pain and irritability, and sudorifics to lessen the general fever;* Epsom salts in small doses three or four times a day, as a tea spoonful; or six grs. of tartar emetic may be dissolved in a quart of water, and if the bowels are costive, a wine glassfull may be given every two hours; if a sudorific is required, the same every four hours; and if the stomach is out of order, the same quantity every ten or fifteen minutes will operate as an emetic. A table spoonful of the spiritus mindereri may be given with it, or the spirit. mind. alone may be taken.

Sometimes abscesses form after fevers in different parts of the body; it is necessary to determine their existence early, by feeling for them, and open them, either by an incision made directly into the abscess, or by a seton run through it; the last mode has the advantage of discharging the matter slowly; excessive debility, from the inflammation of the sac, or fainting, from the rapid discharge of its contents, is thus avoided; the latter is sometimes followed by death, in low fevers:

When an abscess forms of any considerable extent, it is proper to open it by drawing the skin to one side and keeping it in this situation, and then plunging in the lancet; keeping it open till a sufficient quantity is drawn off, to prevent debility: by letting go the skin the aperture is covered and the further discharge of the matter is prevented: or a flat trocar, with a canula concealed in it, may be run in below the skin, and then plunged into the abscess, and thus the matter may be drawn off through the valvular incision, without endangering the access of air to the cavity, which might, if emptied entirely, endanger life by inflaming its sides: The strength must be supported by a diet of mutton, beef and fowls, avoiding diluents, taking the bark or other bitters with wine, porter or brandy, as they may suit the system. In dressing the abscess, after opening it in this way, all that is necessary is to draw the edges of the wound close by adhesive plaster, to apply a compress wet with lead water over the wounded part, and surround it with a roller; the skin heals up without leaving a scar; an abscess may be cured in a very short time in this manner, which, without it, would have endangered life, or occupied months in its restoration. This plan is practised, particularly, with regard to the abscess of the psoas muscle, in which, from the size of the collection of matter, the danger of inflammation of the sides of the cavity is particularly great. The state of the system is to be learnt, partly from the qualities of the healthy pus, which are to be found in page 267, and also from the debility, the night sweats, &c.

Abscesses become dangerous, if seated in vital parts, as on the surface or in the brain; a very small portion of matter on the surface of this organ will produce death: in the heart, they are also dangerous; in the liver, also, from the danger of their bursting internally; in the lungs, they often kill by suffocation, when they burst: Abscesses in the pharynx, also often produce death by pressure on the glottis and epiglottis; also, when they form between the prostate gland and rectum; they obstruct the urethra, and the patient dies of suppression of urine.†

The size of abscesses, also, frequently makes them dangerous; the system is exhausted by the inflammation which comes on in their sides after opening them; or if this does not take place, the discharge of matter exhausts, and the cavity becomes so large, that the system cannot fill it up.

Sometimes, the matter of an abscess is removed by absorption, the cavity gradually filling up by the formation on its sides of granulations, which consist of the growth of blood-vessels, in the form of small red conical eminences; by their contraction they diminish the abscess, till at last it is completely obliterated.

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* A. Cooper.

† A. Cooper's Lectures, vol. i. p. 143-4.

In general, common boils should not be opened, as they do not heal so readily as when left to nature, particularly if punctured unnecessarily or prematurely.*

When an abscess appears in the liver or any part of the abdomen, in the thorax, over the large joints, in the eye, under the cranium, under the fasciæ, the spreading of the matter, or the destruction of the functions of important organs by its detention, of course, renders it expedient to let it out immediately: the penetration of matter into the cavities of the abdomen, thorax, or of the larger joints, is often fatal. The same is true of abscesses near a bone, except when they appear between the cranium and pericranium from severe courses of mercury; if unattended by any blush on the skin, they must not be opened; purging and sarsaparilla will then cure it; but if there is a blush on the skin, it must be opened, as exfoliation will take place.†

Abscesses are best opened with the lancet or bistoury; the use of caustic is tedious, more unmanageable, more painful, and leaves a scar: It is entirely inadmissible in the face and neck of women: To prevent them, Astley Cooper gives the following directions: Keep the bowels open with calomel and rhubarb; apply evaporating lotions to the part; low, but nutritious diet; The abscess must be opened before the skin over it is much affected; open the abscess with a knife the eighth of an inch wide; it appears like a needle to the patient; the opening must be small; after opening it, all the solid flakes of matter found in the abscess must be squeezed out; if they are not removed, sloughing is the consequence, and if they are, adhesion will take place:

The abscess must not be opened if it be of the colour of a grape, as it will certainly slough; The direction of the incision must be across the neck, so as to be concealed, if possible, by the creases or folds of the skin: if any part of the abscess does not heal, a small injection of sulphate of zinc or copper is recommended.‡

When caustic is used to open an abscess, it is applied by dipping the end of the caustic in water and rubbing it upon the part, previously covered with a piece of adhesive plaster, with a hole cut into it of the size of the intended eschar: When the skin becomes brown, we desist, the surface being washed off with some wet tow; the plaster is then removed, and a poultice of bread and milk or flaxseed meal applied over the part:

Abscesses should be opened in their lowest part, to give a free vent to the matter; as the greatest pressure, from the weight of its contents, is there, of course the absorption is there more likely to take place, and the matter to escape more easily; besides, if the abscess be opened on the upper instead of its most depending part, the pressure of the matter upon the lowest part will be sufficient to prevent the formation of granulations to fill it up, and the abscess healing from the top downwards, will be more likely to form a fistula.

When, however, the abscess happens in the foot, or on the inside of the mamma, and points on the upper parts of either, it would be absurd for the sake of opening it at its lower part, to cut through from the bottom upwards: the place of pointing must, of course, be opened:§ Sometimes, as in the abscesses which form below the fasciæ of the fore-arm and thigh, and always point at the most attenuated points of these coverings, it is necessary to cut through a considerable thickness of flesh, in order to let out the matter, so that it may have a dependent opening: The abscess of the sheath of the rectus abdominis must always be opened in its lowest point.

To prevent the opening from healing, some lint spread with some simple cerate must be insinuated between the lips of the wound, and the matter drawn off twice a-day, and the whole covered with a poultice.‖

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* Hunter.

† Ast. Cooper's Lectures, vol. i. p. 151. Lond. 1827.

‡ Cooper's Lectures, p. 154–5. § Cooper. ‖ Ibid.

ABSCESS IN THE HYPOCHONDRIUM OF INFANTS.

Falls, blows on the part, lying on the grass, produce this disease. Complaints of the bowels, or cholera, frequently precede it; A tumor accompanied by symptoms of inflammation, appears early about the regio pubis; as it takes place between the muscles and the peritoneum, it should be met by V. S., low diet, castor-oil, salts, clysters and other opening medicines; leeches also should be applied to the part, followed by a blister to resolve it; if this is impossible, a poultice may be put upon the part and an opening made into it as soon as possible, lest the matter should penetrate the cavity of the abdomen.*

ABSCESSES IN THE EAR.

Abscesses often form in the ear; cleanliness by injecting milk and water, and if the discharge is fœtid, some stimulating injections, as weak brandy and water, will be advisable: Underwood advises, in the fœtid discharges from the ears of children, that fumigations with cinnabar, and the œthiops mineral (hydrargyrus cum sulphure) should be made round the ear morning and evening; a blister to the nape of the neck, and a few purges of calomel repeated every other day.

ABSCESS IN THE LABIUM.

This is produced by the usual causes of phlegmon before discussed, as contusions, &c.; this cause often produces it during labour; it often, however, arises apparently spontaneously, and resembles in its progress and treatment all other abscesses: As soon as inflammation appears, resolution must be attempted by lead water, cold applications, &c. and after the matter forms, it must be opened, poulticed, &c. as directed under the head of phlegmon.

MORTIFICATION.

When inflammation threatens mortification, the general fever diminishes, the pulse becomes weak, fluttering and irregular, the patient has a death-like, wild look, a cold clammy sweat, delirium, diarrhœa and hiccup, the last of which is characteristic of gangrene.

The parts affected become soft, brown, livid, blistered, black, cold, and dead; the fluid contained in the vesicles, being clear, coloured or turbid; When these symptoms exist in a slight degree, or in their forming stage, it is called gangrene; when cold, black, and dead, sphacelus or mortification; The dead part, which separates, is called the slough.

CARBUNCLE, OR ANTHRAX.

Its causes are various; thus, in a common boil, it may rise from a great increase of action, though this is rare in phlegmonous inflammation in healthy subjects, whose powers of resistance to disease are unimpaired; but, when intemperance, gluttony, and age have debilitated the patient, the tendency to inflammation being still preserved, phlegmon, then, is frequently followed by mortification; it is then termed carbuncle or anthrax, and occurs most commonly on the back. It appears sometimes in low typhoid fevers, in malignant bilious fever, and is a common symptom of the plague.

It resembles at first the common boil, appearing as a pimple, which gradually enlarges into a hard tumor, in the skin, of a dark red, or livid colour, sometimes with a blister on its apex, painful, itchy, and when excoriated, discharging a thin brown sanies. It is often attended with fever, delirium, pulse small and frequent, other symptoms of a low grade: When it occurs in low typhous fever, it is attended with great stiffness and hardness of the parts surrounding it; pale and restless, with a white or deep red tongue, low pulse, clear or

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* Underwood, vol. ii. p. 53. Lond. 1819.

turbid urine, the patient exhibits the symptoms of this form of fever, always in an aggravated degree, the carbuncle passing on to mortification rapidly.

Several apertures appear in the tumor in its ordinary form, from which is discharged an irritating, fœtid, and bloody sanies, with great internal sloughing of the cellular membrane: Sometimes the carbuncle is as large as a plate; exhausting the system and producing death speedily.*

TREATMENT.

It is treated by the application of a blister to the surface of the tumor, with the view of arresting its progress, when the tendency to mortification is first perceived. This practice was suggested to Dr. Physick from its success in mortification from erysipelas, as observed by Dr. Pfeiffer. Other stimulating applications may be made; as poultices of bark and yest with brandy; If the system is highly phlogistic, the pulse full, hard, &c., and signs of high fever and inflammation appear, blood is to be taken from the arm, or locally by leeches, as the symptoms may justify; it must, however, be recollected that the subjects, in which carbuncle occurs, either do not bear venesection at all, or badly: they, on the contrary require high and stimulating treatment: After mortification has taken place, free and deep incisions should be made into the cellular membrane, so as to discharge freely the sanies, supporting the system by bark, wine, tonics, and nourishing food and drinks: Elixir vitriol will be found to be useful. Opium also gives great relief, as the pain is intolerable.

The bowels must also be attended to, and the stools corrected if black, or in any way unnatural, by purges of soda and rhubarb, in the dose of ten grains of the former to five of the latter every hour till they operate, combined with some of the sudorifics, mentioned above, if fever and general irritation prevail; if, however, typhous symptoms have commenced, purging to any considerable extent will be dangerous. Opium, bark, and elixir of vitriol, with cordial and nourishing diet, and drinks, are then the best remedies: The state of the general system must be watched in all cases of mortification, for, as this result is serious, it is evident that it must always be more or less implicated: The maxims, principles, precepts, and plans, given under the head of fever, must also be recollected.

A cataplasm of charcoal and yest† which may be united with bark, should be applied over the tumor; the charcoal corrects the sanies and the smell after mortification has taken place; and the bark strengthens and stimulates the part to a more healthy action previous to its complete death: If there is great pain, a strong infusion of poppy heads, or of opium, may be added.

Erysipelas is often united with phlegmon, and has a great disposition to gangrene; this combination is treated in the same manner by blisters as advised by Dr. Pfeiffer, applied on the inflamed surface, and by incisions freely made into the cellular membrane when it appears that gangrene is taking place and resolution is impossible: We thus give vent to the matter, and are enabled to remove the sloughs, which form extensively beneath the skin: The fever and local inflammation in this case are to be treated by the general means formerly advised, the fever by bleeding and sudorifics, &c. the local symptoms by cooling washes; if there is any hope of resolution, previous to resorting to the blister, or the incisions.

GENERAL REMARKS ON THE TREATMENT OF MORTIFICATION.

Mortification, in general, proceeding from increased action, must be cured by general and local bleeding, proportioning it to the strength of the system.

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* Cooper.

† It is thus prepared; Wheat flour, yest, of each half a pound: charcoal powdered ℥iv: These are to be mixed together, and put into a moderate heat till the fermentation begins, and applied when the part is disposed to slough. The bark is added according to the discretion of the practitioner.

The signs of fever, in the hardness and tensity of the pulse, &c., formerly mentioned, will be sufficient evidences of the necessity of this evacuation.

Purgatives have generally a bad effect, from the debility they produce; the bowels must be kept in a natural state: Emetics, on the contrary, have a good one, when there is general fever: Bleeding, however, must be principally depended upon; and if the sphacelation does not stop, when the system has been sufficiently reduced, a blister must be applied to the part; wine, bark, musk, volatile alkali, with the various plans formerly advised under the head of typhous fever, must be used with the utmost energy: These remedies suit all cases, and are attended with the happiest effects, where the heart and arteries are debilitated; but they are improper, in its inflammatory states; and it is for this reason, that the bark and other excellent medicines, prescribed at improper times, have lost their character. Sometimes the bark excites purging; a few drops of laudanum then are proper: Sometimes it vomits, Richter then advises it to be given in a very fine powder; or camphor in the dose of 2 grs. or spirits of turpentine in the dose of ℥ss. may be given. The nitric and oxymuriatic acids have also done good taken with the bark: The elixir vitriol is likewise useful. All those means enumerated under the head of typhous fever, which are successful in keeping up the arterial action, must in the low state of mortification be resorted to: The bark, however, must be stopped, as soon as the mortification has ceased to spread, if its margin is inflamed, without the debility of the system requires it.

If the abdominal viscera be out of order, as is evinced by bilious and furred tongue, bitter eructations, indigestion, flatulency, nausea, an emetic is the best medicine, the bark will then do harm: Sometimes, though an inflammatory state of the system may be present, still from the danger of sinking after mortification takes place, it will be proper to give wine whey, camphor and opium combined, with small doses of the bark to prevent excessive debility, when the system sinks: Calomel in small doses to encourage the secretions, will be proper:

The gastric fluid of graminivorous animals, has been recommended, as a good local application in gangrene, when the parts are about to separate: Any gently stimulating application to excite the blood-vessels to suppuration will also have a good effect: Benjamin Bell advises ʒi. of muriate of ammonia, ℥ii. of vinegar, and six of water to be applied to the part.

The object of applying the blister is to stimulate the vessels, to penetrate with more vigour into those parts, which are nearly gangrenous, and thus to prevent the extension of the mortification; also to separate the dead from the living parts, by encouraging suppuration in those which are completely alive: The charcoal poultice, made by mixing ℥ii. of powdered charcoal with ℥ii. of linseed meal, and ℥viii. of hot water, or the beer poultice made by stirring into the grounds of strong beer as much oatmeal as will render it consistent; or the effervescing poultice, made by stirring into an infusion of malt, as much oatmeal as will give it consistence, and then adding a spoonful of yeast, will be found, when the sloughs are formed, proper to abate the smell and stimulate the vessels to suppuration.

With regard to the application of the actual cautery and of caustic substances; also the use of deep scarifications and the injection of stimulating gums, and other substances of the same nature into the mortified parts, they are now obsolete: Scarifications or incisions are made into the dead parts, only with the view of permitting the passage of matter to the surface; or of removing some parts of the slough to diminish the fœtor: The separation of the mortified parts, in a general way, is best left to nature.

MORTIFICATION FROM DEFECT OF ACTION.

Mortification often proceeds from a defect of action in the vessels of a part: As, in the mortification of the toes of old persons: Uneasiness through the whole foot and ancle, particularly at night, a small part on one of the toes be-

coming discoloured, either black or blue, are its first symptoms: Sometimes it is slow, at others, rapid and painful: Swelling, lividity, and vesication occur as it advances; it appears more frequently among high livers, particularly great eaters, and often in old men; but it is by no means peculiar to them; ossification of the arteries, as has been alleged, is not always the cause of it.*

TREATMENT.

Opium, given so as stimulate the system gently, is the proper remedy: Mr. Pott gave generally three or four grains in twenty-four hours; two grains being administered night and morning: It must be given in such doses as not to excite delirium, affections of the heart, fever, nor to take away the appetite: The linseed or bread and milk poultices are the best local applications:† Camphor has been recommended also in union with the opium.

MORTIFICATION FROM COLD.

When a part is exposed to very intense cold, it becomes white, bloodless, and without feeling, so that the person is not sensible that any change has taken place, till he is informed of it by some of his friends: the application of snow, of ice, or water near the temperature of 32°, is the most convenient and best remedy: This injury often happens to sailors in winter; the feet and hands often slough off, and leave the patient a cripple for life.

When first seen, the sugar of lead dissolved in water, applied cold, I have seen to have a beneficial effect: If heat be applied to the parts thus exposed, they slough off and die: the temperature of the water must be raised in the most gradual manner, to that of the room, and it must appear evident that the parts have regained their vitality before this change is made to any great degree; at the same time taking care to avoid inflammation in the parts already restored by the long application of the cold.

HOSPITAL GANGRENE.

When a number of persons with bad sores are crowded together in a hospital, from the effects of bad air, the ulcers suddenly slough; the disease is called hospital gangrene: it kills, and is the result of a typhous state of the general system.

This species of gangrene is said to be contagious from the dressings, blankets, clothes, &c. of the sick; it is probable that there is nothing specific in the poison; it operates as the poison of typhus does in other instances; it is the product of animal filth, and depends upon the number of people crowded together.

TREATMENT.

The actual cautery applied to the sore, or the liquor arsenicalis diluted with an equal quantity of water and applied to it by lint; and a solution of potash, as a wash, after its application, are among the most prominent local remedies: the wound as soon as the slough separates becomes a common sore.‡

The plans for purifying the air and strengthening the general system, used in typhous fever, here become necessary, and are more to be relied upon when they can be procured than any application whatever.

BURNS.

Redness, smarting, and small blisters, are the effects of hot water or vapor applied to the skin; if the heat be more intense, the skin blisters, suppurates,

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* Pott. † Cooper. ‡ Thomas.

and general fever follows; or if still more so, it becomes dead and black, according to the depth to which the heat extended, also to its duration and the sensibility of the part.

Besides the general fever, burns produce the inflammation of some organ, as the lungs: The affection of this organ is shewn by the remarkable dyspnœa and oppression, amounting in some instances to asthma, as also by examination after death: Coma shews that the brain is also affected.

TREATMENT.

The treatment has varied at different times; the most valuable local applications are those of Mr. Kentish, such as spirits of turpentine, alcohol, ether, and the fluid volatile alkali, so applied as to prevent evaporation; they are preferable to cold applications, as they do not endanger the general health in delicate and debilitated habits by catarrhs, croup, colic, &c. The turpentine heated in hot water, is applied by bathing the parts with it two or three times; an ointment composed of basilicon, softened with the turpentine, is then to be applied over it, by linen, and to be renewed in twenty-four hours, washing the burn with alcohol diluted, or laudanum made warm; as soon as suppuration takes place, milder applications must be made: In dressing it a second time the plasters should be spread so as to be put on immediately on removing the others, which is to be done piece by piece: On the second dressing it will be found that the inflammation has abated; other less stimulating articles, as diluted alcohol, or laudanum, must then be applied at every dressing, till the inflammation is entirely gone.

If alcohol or laudanum should be too stimulating, Goulard's cerate, or that of lapis calaminaris should be advised, applying very finely powdered chalk between the sloughs and the living parts to keep down the granulations, and absorb the pus; afterwards a plaster, and then a poultice over it: At the same time the patient must take æther, alcohol, or opium, internally, repeating it once or twice within the first twelve hours, and afterwards ale or wine, till it be no longer necessary from the return of the system to health.

When the burn is moderate, the application of the turpentine once will generally be enough: the lapis calaminaris or the Goulard's cerate after it will then be sufficient.* The danger of exciting ordinary inflammation by the application of the turpentine, renders it particularly necessary to avoid applying it to the sound parts: Simple cerate, applied by linen and covered with a poultice, will, however, soon allay any inflammation excited by the dressings. With regard to Mr. Kentish's plan of stimulation, there is considerable difference of opinion among practical men; bleeding and low diet have been advised by some, and the stimulating practice by others. There can be no question, inflammation of the viscera has been discovered after extensive burns, though previous to the knowledge of this fact, it was the practice of the most eminent men to draw blood from the arm, and to pursue most rigidly the antiphlogistic regimen.

The differences, perhaps, can be reconciled: When the burn is sufficient to excite the system into fever, with a hot and dry skin, furred tongue, and hard pulse, it operates as the inflammation of the pleura, or that of any other part; the fever runs high, and bleeding, &c. is necessary. But when it is very extensive or deep, with death of the parts, the system becomes prostrated; as evinced by great weakness, cold extremities, pulse quick, fluttering and feeble, vomiting, hiccup, and coma; stimulants, such as bark and wine, from the debility produced by the local affection, then become indispensably necessary, in proportion to the prostration: opium in particular relieves the coma very successfully: The general symptoms and state of the system will sufficiently determine the propriety of the means to be pursued.

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* Kentish.

In general, in burns, Mr. Cleghorn advises a moderate diet of animal food, wine, and porter; he found it seldom necessary to let blood: he kept the bowels open with prunes; and never gave purgatives, from the pain resulting from rising on their operation, and from the weakness they produced, which he thought prevented the healing of the sores: In common cases this plan, where there was no great reaction or prostration, would answer well.

It is best not to open the blisters till the pain is removed, and then the openings should be small, made with a needle, and those parts which are contiguous, and excoriated, should be separated till perfectly healed by dressings of simple cerate, to prevent their growing together: The eyelids, fingers, and nostrils are most liable to adhere; and, as in other sores, the use of the red precipitate ointment, the nitrate of silver, or burnt alum, or a plaster or ointment of white lead, should be applied to keep down the granulations: strips of adhesive plaster, a roller and compresses will assist in the same object by proper pressure.

If the burn has arisen from the explosion of gun-powder, the particles of powder should be picked out with the end of a knife to prevent discolouration of the skin.

Strong vinegar, gently warmed; ice, or very cold water; a liniment composed of equal parts of lime water and sweet oil, applied by means of a soft pencil or feather; common ink applied by cotton dipped in it, a weak solution of sugar of lead; all succeed in abating the pain, heat, &c. They must be used as long as these symptoms continue; and then the part must be covered with powdered chalk, and a poultice laid over it.

The oil of turpentine and alcohol will be found to be the best remedies; cold water the next best, when these or stimuli of the same kind cannot be procured.

CHILBLAINS.

Redness, itching, and heat of skin on the feet, nose, ears, lips, face, but more rarely on the hands constitute the first grade of chilblain; greater swelling, with lividness, and an increase of the other symptoms, the second; the same, with vesicles and at last sores or sloughing, form the third species. Sudden exposure to a warm fire, after being excessively cold, or to cold after being very warm, produces it.

TREATMENT.

The clothing should be moderate, the feet, hands, &c. should not be kept too warm; they should be often rubbed; the constitution should be inured to vicissitudes; at the same time avoiding sudden and excessive changes of temperature:* Apply water at the temperature of 32°, to the part inflamed; if that is impracticable, pour it over it at the temperature of 50° in a stream; it will soon remove the itching and heat: ether dropped upon it; spirit of wine also; vinegar; heat almost to scorching; soap liniment; a mixture of oil of turpentine and soap liniment; oil of turpentine and spirits of rosemary warmed; or ℞. alum ʒii. acetic acid diluted, and brandy, of each, ℥vi. m.: or ℞. Tinct. cantharid. ʒiiss. sapon. comp. liniment ℥ii. m.; or ℞. Liq. ammon. acetat. et lin. sapon. comp. āā ℥ii. m.; or hot salt and water; or a decoction of turnip peels; or marine acid diluted with water; or hot wine; or butter of cacao; or balsam of Peru; or balsam copaiba; or pitch ointment; or squills applied with hot oil or turpentine; or strong infusion of mustard; or hot vinegar. The local use of ice is often dangerous, when the patient is subject to croup, colic, cough, pleurisy, rheumatism, or any inflammatory disease: The stimulating remedies may then be used: In order to restore the parts to their original soundness, frictions, warm

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* Cooper.

clothing, frequent exposure to the air, &c. as above advised, will be found to be at last the most effectual remedies.

When vesication has taken place, the preparations of lead, as the Goulard's cerate, the lead water poultice, made thus: R. Aq. lithargyr. acet. ℥i. aq. distillat. ℔i. micæ panis q. suf. misce, may be used, till the inflammation is abated.

Spirituous applications; as, the tincture of myrrh, alcohol, oil of turpentine, water of ammonia properly diluted with water, or with the liniment made of equal parts of lime water and linseed oil, if they should be too stimulating, will be found to be useful, if mortification has taken place:*

When suppuration and ulceration have supervened, tincture of myrrh, warm vinegar, lead water, red precipitate ointment, lunar caustic, ether in solution, half grain to the oz. of water, or by touching with it in substance the surface of the sore, when the parts are fungous, will be proper, and a poultice if sloughing should have taken place; afterwards the sores must be dressed with basilicon; first pure, and in a few days slightly reddened with red precipitate; when the parts become insensible to the basilicon, increasing cautiously the strength of the application, otherwise sloughing will be the consequence.

SCIRRHUS OR CANCER.

Scirrhus is a substance, resembling gristle or cartilage in texture and consistence; it forms most commonly in glandular parts, as the uterus, the female breast, and in the testicle; when a scirrhous tumor is opened, in the centre is found a part, which is of the consistence of gristle, from which narrow irregular lines, of a white colour, diverge into the surrounding gland, the substance of these lines becoming less compact towards the edge of the gland; these lines are then crossed by others of the same colour and texture:

When suppuration has taken place, sometimes a bloody sanies forms in the centre of the tumor, the cavity containing it having an ulcerated, jagged, and spongy surface: Sometimes no ulcer forms in the centre, the whole tumor consists of a sac, filled with a transparent fluid, and a fungous excrescence projecting into the cavity, the lining of which is smooth and polished.†

Schirrus, however, presents many varieties: It usually begins with a hard, small tumor in one of the glands without pain, sometimes remaining for years without advancing in the least, at others coming on rapidly.

When it forms near the surface of the breast, the skin becomes of a dull, leaden colour, and puckered, so as sometimes to conceal the nipple entirely, the tumor to the touch is knotty, hard and uneven, fixed to the skin above, and to the muscles below, with pains darting now and then through it: As the disease advances the skin becomes red, the whole lump purple and shining; fever then appears. The cancerous ulcer is gradually formed in part by the sloughing, in part by the ulceration of the skin; when the cells are laid open they form a pulpy surface, discharging rapidly and in great quantities an ichor, of a peculiar smell; New flesh forms, of a fungous character and peculiarly hard, which occasionally cicatrizes:

The edges of the cancerous ulcer are painful, reversed or inverted, ragged, uneven and hard; the surface of the sore is also unequal, with considerable risings and depressions, and excavations, in different parts of it; the discharge sanious, ichorous and fœtid, excoriating the neighbouring parts; The ulcerated surface burns, and the shooting lancinating pains, which at first were so painful, increase;‡

When the ulceration is going on, the disease extends through the glands and lymphatic vessels, from those of the armpit, to those in the lower part of the neck and upper part of the chest: Small tumors, of a similar structure, form at some distance from the original disease, making an irregular circle round it: The pain and irritation undermine the constitution, emaciation, difficulty of breathing and cough appear, and the patient gradually dies.§

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* Thomson. † Home's Obs. on Cancer.
‡ B. Bell. § Abernethy.

Blows, bruises and the ordinary causes and states of inflammation produce cancer;* grief and anxiety are also its causes: Astley Cooper states, that he has often observed it to appear in the breast of a mother, who had been suffering under long continued anxiety for the illness of a child: Sorrow for the loss of relatives, also, often produces it. It is favored by age and by the unmarried state in women; when it occurs in the married, the menses almost always cease first, shewing a connection between them; it also appears very commonly at the period when this secretion disappears. It occurs even in subjects as young as five years, but is most common in advanced life.* In cold countries, it is more common and more intractable than in warm latitudes: Cancer occurs more commonly on the lips and in the breasts of women than in any other parts; the organ next to the breast, most frequently affected, is the womb;

In some families it is hereditary, and scrofula appears to predispose to it: It is not communicated by inoculation, with the matter of cancer, as has been proved by repeated experiments by Mr. Alibert.† The opinion that it arises from hydatids has no foundation.

Cancer has the power of affecting with the same disease, the neighbouring lymphatics and their glands and other structures; The glans penis, the sides of the nose, the lips, and the os tineæ, however, are subject to an affection, which by some is considered cancerous, but which has not this power; it differs from cancer, in being an uniformly progressive eating sore, whereas cancer has hardened edges, which does not extend itself on the surface, after the hardened ridge which appears soon after ulceration is fully formed: This affection also differs from cancer in being sometimes curable.‡

TREATMENT.

With regard to the treatment of genuine cancer, it is in almost every case incurable: But as the system may be more or less involved, the local disease may be more or less malignant; and as for its different degrees, we have no positive discriminating tests, we cannot positively determine, how far it is certainly curable: we must therefore approach it with all the energy and well applied means which the profession furnishes.

In its early stages, when a hardened tumour first appears in the breast, leeches frequently applied, are praised by the French surgeons, as sometimes successful; they consider it as inflammatory, which the darting pains certainly would induce us to believe: At the same time, the diet must be excessively low; vegetable entirely, whey, summer fruits, &c., abstaining from all animal and oily food, fish, butter and eggs: The leeches should be applied near the tumor, but not immediately over it, as they may accelerate ulceration; purgatives should be given at the same time, and if the patient is plethoric, general bleeding; and after the sores have healed, we may apply a solution of sugar of lead to the tumor.

A mercurial plaster applied over the tumor sometimes is useful. Blisters which are recommended to resolve the swelling hasten the ulceration, if not applied very early before the skin adheres to the tumor. After the skin has begun to adhere to it, extirpation either by the knife or by caustic is the only remedy: At different times various plans have been pursued, we shall merely notice them; Cicuta (conium maculatum) in the dose of two grs. of the extract or of four of the powder recently prepared, given twice a-day, and gradually increased till it produces vertigo, has been highly praised; it is a remedy of little power. Cancer sometimes remains in a dormant state; in cases of this kind, it may appear to do good: and as it enables the system to do without nourishment, probably in these cases it may sometimes be useful; but they are very rare; the remedy is, therefore, very doubtful, even in these cases; in general,

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* Cooper. † Alibert's description des malad. de la peau ‡ Home

certainly it never cures: It has been used as a bath; in this form it is too disagreeable to be tolerated, and it is equally useless: Mercury aggravates ulcerated cancer; the decoction of the woods has also been of no use. Corrosive sublimate and arsenic, which last was thought by Mr. Justamond to be a specific in cancer, have been prescribed, but without greater success than other plans: The Fowler's solution (8 drops thrice a day) has also been given, also the muriated barytes; when scrofula is united with this disease, the last remedy may be of use:

Opium would answer as well as any other narcotic; it however, promises nothing; the same may be said of belladonna, it is given in the dose of a gr. of the dried leaves; of hyosciamus, also, which is given in the dose of two grs. of the extract. The laurus cerasus, the hepatized ammonia, the solanum dulcamara, the digitalis, paris quadrifolia, phytolacca decandra, are all equally useless: Tonics have been recommended, as the carbonate of iron, in the dose of five grs. every four or five hours, with aloes in the dose of half a gr. three or four times a day, to keep the bowels free: Sulphate of iron in the proportion of an oz. to a pint of water, applied by linen to the cancerous sore; also the acetate of iron diluted with eight or ten times its weight of water, are praised; the phosphate, acetate, carbonate, and arseniate of iron, applied externally have been highly beneficial in the opinion of Mr. Carmichael: It is said, that the first effect of iron is a speedy alleviation of pain, the smell is corrected, the discharge is diminished, and the sore looks better. Dr. Denman also states, that in his experience iron has done more good than any other medicine in this complaint; like all others in genuine cancer, it will fail: In cancers of the face, penis and uterus, which have not the malignity of those of the breast, these remedies, or others, may have been useful; experience, however, confirms the general mortality of the disease in its genuine form.

Of all other plans, a diet of whey or other mild diluent substances, such as sago, tapioca, just sufficient to support nature, promises more than any other plan. Cancer is a slow inflammation of a part advancing through its different stages in a protracted manner, from the hardness and want of vascularity of its structure: This inflammation may be rendered slower by a diet, so low as just to enable the patient to live, or the tumour may be removed. This last is the most effectual plan:

Extirpation should always be performed by the knife; because every part of the cancer can be seen, and in that mode be removed; the pain is more tolerable and the operation is less protracted: The operation should, if possible, be performed before the tumour is attached to the bone, or other solids below, removing all the diseased parts, and the hardened glands in the neighbourhood. But as some patients will not submit to extirpation, certain caustics are resorted to for this purpose; of which arsenic is the most celebrated: It has the property of not acting on the skin, unless it is abraded, and when applied to the bared cutis, it produces an escar, deep in proportion to the strength of which it is applied; it is therefore not necessary that it should be in contact with the parts intended to be removed.

The following formulæ have been advised: Take of arsenic powdered, ℥ss. powdered antimony ℥ss. flux them in a crucible, and reduce them to powder, and apply it to the sore: The addition of opium renders it milder:* Seventy parts of cinnabar, twenty-two of sanguis draconis, and eight of the oxide of arsenic made into powder, and formed into a paste with a little water or mucilage of gum arabic, forms the paste arsenicale of the French surgeons.

Equal parts of white arsenic and sulphur, also, are used for this purpose; or two or three grains may be mixed with powdered calamine and strewed on the cancer, daily, till it sloughs off: Anodynes given by the mouth and by fomenta

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* Thomas.

tions, are necessary to alleviate the pain; or opium in powder may be mixed with the caustics.

Plunket's powder is composed of the fresh gathered leaves of the ranunculus acris, (crow-foot) of the flammula vulgaris, (dog-fennel) of each an ounce, levigated white arsenic ʒi. washed sulphur ℈v. mixed together; after first bruising the vegetable substances, the whole is to be beaten into a paste, formed into balls and dried in the sun. When used, they are powdered, and applied on a piece of pig's bladder to the sore; it must remain till the caustic separate spontaneously: When applied to the nose or lips, it must be used with the greatest caution,* lest the arsenic gain admission into the system. Arsenic when applied extensively is proved to produce inflammation of the stomach, and death; it must be used, if at all, much reduced, and with the greatest caution.

The external applications, recommended in case ulceration has already taken place, are the carrot poultice made by bruising the recent carrot root either raw, or what is better, boiled into a pulp, in a mortar; it has the effect of correcting the fetor, improving the appearance of the sore and giving ease to the patient: The hemlock (conium maculatum) poultice has also the same effects: It is made by boiling two ounces of the leaves of the plant, in two pounds of water, till only a pint remains; then, as much linseed meal is to be added, as is sufficient; or the fresh leaves of the plant may be bruised and applied in that state: The fermenting poultice made by adding lb.ss. of yest, and the same quantity of wheat flour, and exposing them to a moderate heat till effervescence begins, and then adding four ounces of fresh made charcoal in powder; or by mixing half a pound of the common linseed meal, and four ozs. of charcoal powder, and as much water as will make them into a paste, and applying it to the surface of the breast, are useful to correct the fetor. The fermenting poultice must be changed every three or four hours, otherwise the smell becomes intolerable: The charcoal and flour poultice can be applied longer.

The oxymuriatic acid diluted with three times its weight of water, or more, according to the pain it occasions, has been recommended by Dr. Crawford; also carbonic acid gas, applied by confining it on the sore by a pig's bladder drawn over it, and fixed to it by adhesive plaster; the fixed air is thrown into it by a pipe introduced into the bladder; it improves the appearance of the sore, lessens the fetor, but does no permanent good.

Cleanliness should be observed; to prevent excoriation of the parts round the sore, the breast should be suspended, and kept in a moderate temperature:

A solution of ʒiiss. of borax, and ℥viii. of distilled water with ʒiiss. of laudanum, may be used to abate pain and heal the parts.

Absorbent powders have been applied to the sore without effect. The gastric juice of animals has also been recommended for the same objects:

Digitalis is also advised; it may be prepared as the hemlock poultice, and is about as valuable:

Adhesive plaster drawn across the sore, shields of lead laid over it, and compresses, and bandages applied so as to produce pressure, which must be gradually increased, beginning with long adhesive straps only, first in single, then in double layers; filling up the sore if ulcerated with chalk, and avoiding all wrinkles in applying the plaster; then making pressure with the shields of lead, are among the latest projects, for the cure of this terrible malady: like the others, they are now thought useless.

SCIRRHUS OF THE TESTICLE.

Scirrhus appears in the testicle, as a hard, rough, tuberculated swelling, extending up the spermatic cord with darting and lancinating pains to the loins and abdomen; the testicle loses its original shape, becomes heavy and excessively

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* Thomas.

hard; the indurated, thickened, knotty, and tuberculated feel is extended to the spermatic cord: It ulcerates and runs through the changes mentioned above, the glands in the neighbourhood partaking of the affection, and gradually destroying the patient.

SCIRRHUS OF THE PROSTATE.

An uneasy sensation about the rectum after going to stool, an occasional discharge of mucus, darting pains, dysury, entire suppression, great thickening of the coats of the bladder, and tenesmus, distinguish the scirrhus of the prostate: Astley Cooper mentions, that a pain in the inside of the thigh is characteristic of it. It is produced by frequent natural or unnatural venereal excitement, by gonorrhœa, strictures, and the use of the bougie. It ends in open cancer, communicating by fistulous openings with the rectum: The enlargement of the prostate, consequent on scirrhus, may be felt by introducing the finger into the rectum. It is like the other forms of cancer incurable; the patient often dies of suppression of urine. Mr. Home mentions that suppositories of opium and hemlock passed into the rectum and allowed to dissolve there, did more good, in his experience, in lessening the size of the gland, and the irritation consequent on the disease, than any other plan: Sometimes strictures of the urethra produce abscesses of this part: by removing the strictures, they soon get well.*

CANCER OF THE LIPS, NOSE, &c.

When the disease affects the skin, as the lips, eyes, nose and penis, it occurs either under the form of a small discoloured pimple, wart, horny protuberance covered by a scale, preternatural enlargement or tubercular elevation of the skin; the shooting pain and hardness about the tumor are also characteristics of this form; the glands do not enlarge from its effects, till ulceration has continued for some time; the affection at first is purely local; The surface of the sore, however, presents the same characters as those already described. It is the opinion of Mr. Hey, that phymosis is the most common cause of cancer of the penis. When the disease affects the face, it is called noli me tangere: some forms of which, are curable; Cooper mentions, that in a case which destroyed the alæ of the nose, palate, &c., a poultice made of bread and the aqua lythargyr. acetat. applied twice a-day to the sore, a sudorific draught, and a pill composed of one grain of calomel and one grain of golden sulphur of antimony, taken every day were quite successful: in about three weeks the suppuration and appearance of the sores altered; on the thirty-seventh day the ulcer being well cleaned by washing it with a solution of six grains of corrosive sublimate and the same quantity of verdigris in a pint of water, began to heal upon the fortieth, and was cured completely by the sixtieth day:

He also speaks favourably of the following lotion, ℞. Kali arsenicati gr. iv. aq. menth. sativ. ℥iv.: spirit. vin. tenuior. ℥i. Misce et cola; it is applied by dipping pieces of lint in it,* and applying them to the part:

The carduus tomentosus (or woolly headed thistle or friar's crown) has been used in the form of the expressed juice applied to the ulcer in a case of cancer of the face: it is put on six or eight times a day; it is of no use in cancers of the breast:

Sir A. Cooper recommends the nitric acid diluted according to the irritability of the part, and the liquor calc. cum hadrargyr. oxymuriat. as producing a good effect; Dr. Whytt succeeded, in several cases of noli me tangere, by giving corrosive sublimate in minute doses internally, and washing the sore with it externally; it requires time, three or four months in some cases are necessary: The plan of Sir Astley Cooper, of giving mercury, mentioned under the head of chronic inflammation, may be also used. The wash of corrosive sublimate

* Cooper.

may be made of the strength of half a grain to the oz.. and the solution may be given in the dose of one-tenth or the eighth of a grain thrice a day.

Mr. Home recommends a solution of arsenic, made by boiling white arsenic in water several hours: The dose taken internally, is three to ten drops, and when used for external applications, a drachm is to be diluted with ℔ii. of water, making it stronger as the parts become accustomed to it. He prefers, however, the use of the formula of St. Bartholomew's Hospital; R. Kali arsenicati. gr. ii. aq. menth. sativ. ℥iv. spirit. vin. tenuior. ℥i. misce and cola: The dose is ʒii. three or four times a day. Arsenic appears to be the remedy best calculated for success in this disease: Cooper praises a scruple of the nitrate of silver dissolved in half an ounce of distilled water applied externally, as valuable in some cases. The ointments of nitrate of mercury, of tar, of sulphur are the next most successful: Lotions are generally preferable to ointments; and the disease requires a different dressing every day, sometimes a lotion, sometimes an ointment: The small scaly scabs should be removed after softening them with spermaceti ointment, with as much tenderness as possible:* The Plummer's or compound calomel pill, is also recommended; of which the following is the formula:

R. Calomel, sulphur. antimon. precipitat. āā gr. xii. guaiac. gummi resin. gr. xxiv. saponis quant. suf. m. f. pil. xii. Take one twice a day; Cooper praises the decoction of the elm, and of sarsaparilla with one of the following pills thrice a day; Calomel gr. vi. succ. spissat. cicutæ ʒi. m. f. pil. xii.†

In cancer of the lips, the treatment is entirely surgical; A case is related in the London Med. Journal, in which nitric acid given internally, and an opiate at night, with a lotion of extract of conium, rectified spirit and water, cured a cancer of the tongue.

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* Cooper. † Ibid.

CHAPTER V.

Paronychia—Causes—Treatment—Acute Periostitis—Causes—Chronic—Dentition—Treatment—Sore ears in children—Ulcerations of the mouth in children—Gangrene of the cheek, &c. in children—Induration of the breasts—Ulceration of the navel—Inflammation of the mamma.

PARONYCHIA.

Paronychia is an inflammation of the fingers, which may take place either below the cuticle in the cellular membrane, below the cutis vera, in the thecæ of the tendons, and on the tendons themselves, or between the periosteum and bone. That which takes place below the cuticle often occurs near the nail, a vesicle of matter forming and running round its whole root: The fingers are sometimes affected in succession in this way; sometimes the abscess forms under the nail, where from the difficulty of giving exit to the matter the pain is very great:

The variety which occurs below the cutis vera is attended with excessive pain, confined to the point of the finger. When it occurs in the periosteum, there is no swelling in the affected finger, but there is great pain; it is also confined to the part without extending beyond it, either to the arm or hand: If not soon opened, caries of the bone below must take place:

Inflammation sometimes appears in the fingers and is attended with pain darting and violent near the nail, ceasing for a few minutes and recurring immediately, but lasting for weeks and months; This kind, described by Richter, is called the dry whitlow; the pain at last becomes intolerable and unremitting; extends up the arm, and lasts for weeks and months; it is attended with no secretion, but with a degeneration of the substance of the finger into a fatty substance; I have seen one of the toes completely converted into a structure somewhat between fat and scirrhus: The patient, however, at the time the toe was removed complained of no pain: Its previous history showed also that the change must have been slow and insensible, as no inconvenience was complained of.

When it is seated along the tendons or in their sheaths, neither the pain nor swelling are confined to the end of the finger, the pain shoots into the hand and up the arm, the power of which is lost; the hand is also swelled, and if it continue, the fluctuation of the matter can be felt in the wrist and even in the fore arm; There is nothing peculiar in the character of the inflammation in these varieties; seated on the tendons, the pain is great from their being bound firmly down by their thecæ, and there can be no ease till the parts are completely liberated: It is, therefore, important to distinguish and pay attention to the signs of that variety, which occurs in the thecæ and tendons, of which the difficulty of motion of the finger is the most prominent sign: The same remark applies to the variety, in the periosteum, when it occurs in that part of it seated below the tendons; the pressure produced by the swelling and by every motion of the tendons above it is characteristic of this variety; and as the pain of the inflamed tendon and periosteum is very acute, the general system is most commonly affected, particularly at night with fever, and throbbing, abating considerably, so as to be tolerable in the morning and through the day.

CAUSES.

Sometimes the cause is not very evident: Contusions, wounds with needles, pins, &c.; splinters, warmth applied suddenly to the hand when it is very cold, most frequently produce it.

TREATMENT.

When it occurs below the cuticle, a free opening must be made into it, and the matter completely discharged, otherwise, it runs round the nail, is very painful, and the nail is sometimes lost from the extension of the inflammation round its root: The whole cuticle, as far as can be done conveniently, had better be removed from its surface, and thus its progress will be arrested.

If it forms below the nail, it must be scraped thin with a piece of glass, and then opened freely with a bistoury, so as effectually to discharge the matter; in the early stages of whitlow, it should be treated by all the local and general means, which we employ to reduce inflammation; leeches to the part, holding up the hand to arrest the flow of blood to it, cold applications, a small blister to cover the part, rolling a bandage round the finger and arm, and wetting it with cold water, or a solution of sugar of lead in water; if this does not succeed in two days, a free incision should be made to the bottom of the seat of inflammation, so as to relieve the pressure and tension of the parts: If the symptoms are violent, as high fever with great throbbing in the finger at night, the patient plethoric and vigorous, the opening may be made at once on the occurrence of the symptoms as the most effectual means of allaying the inflammation: This plan of treatment applies to the disease when it occurs below the skin, and in the thecæ of the tendons: When it occurs in the last situation, a free division of the integuments should be made early, indeed as soon as the surgeon is called, as the pain, particularly at night, from the inflammation, is nearly as great as that produced by the operation, which produces instant relief: Ulceration of the surface by caustic applied over the inflamed part often puts a stop to it; nitric acid may be employed for this purpose, limiting its extension by salt of tartar: This last plan answers well, when it arises from a punctured wound; it also relieves the wandering pain, twitches, spasms, &c., produced by a puncture before inflammation has taken place; A blister is also very effectual: as soon as it draws they cease: The peculiarity of this inflammation results simply from its taking place in a situation, where the parts cannot dilate easily, and the matter be discharged as soon as it forms; therefore, if this inflammation should take place in any part of the hand or foot, free opening of the parts is all that is necessary: In all its varieties, therefore, this is the plan; if delayed, extensive suppuration throughout the arm and hand, exfoliation of the bone, or finally, the loss of the use of several joints of the arm are the consequence.

ACUTE PERIOSTITIS.

Periostitis may be either acute or chronic; Intolerable pain, a smooth, hard swelling, heat, erysipelas on the surface; œdema, sphacelus, involving parts adjacent to the swelling, and ending in suppuration; thickening of the periosteum to cartilage, absorption of the bone, or an undue deposition of bony matter on the surface of the part, are its symptoms;* the pulse is frequent, quick, and febrile, and the pain greatest at night.

CAUSES.

A long residence in hot climates, frequent salivations, a scrofulous habit, external injuries predispose to it:

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* Crampton on Periostitis, Dub. Hosp. Rep. p. 333 et seq. vol. i.

Dr. Crampton describes cases of this disease which occurred on the tibia, ossa nasi, &c. In one case which began in a small angry tumor on the right side of the nose, and ended in erysipelas, affecting the face, and finally the brain, it appeared on dissection, that the pericranium on the same side of the os frontis was thicker than natural, in some places of a dark red, with pus below it: This state of things extended to the nose; the dura mater was also covered with pus.

He relates a case, in which the inflammation on the left side of the head was chronic, with a wasted and paralytic state of the left arm; contracted fingers, feeble lower extremities, pale countenance, and incessant pain of the head preventing sleep, and costive bowels. On examination a small tumor was found over the middle of the left parietal bone, soft in the centre, but firm at the circumference, with an opening down to the bone; it was originally produced by a blow upon the part, which was soon followed by severe headach, sickness at stomach, and want of rest, with a rapid decline of health; epileptic fits, and afterwards the loss of the use of the right arm followed; the tumor was opened, its contents were hard, and fibrous, composed of the pericranium, unusually vascular, highly sensible and adherent to the bone below; a circular piece of the bone was removed, exposing the dura mater, which bled freely; the pain abated immediately, and after some irregular symptoms, vomiting, fits, &c., the patient recovered in every respect.

CHRONIC PERIOSTITIS.

Chronic periostitis may exist for a long time, without disturbing the general health; it is often connected with internal causes, as disease of the stomach and bowels; it is then well treated by the administration of the blue pill three or four grains every night, with 4 oz. of chamomile, quassia, or gentian tea every morning, and the compound decoction of sarsaparilla through the day; with a diet of digestible food, as rice, mutton, tapioca, sago, if there be fever, and beef and fowls if there be none; and if the pain does not abate, a division of the part down to the bone.

DENTITION.

The passage of the teeth through the gums produces in children troublesome and dangerous symptoms. Weak and delicate children commonly cut their teeth easily; those that are robust and healthy are more liable to fever and the other diseases peculiar to this state: The weak and the lean are of all others least susceptible of them:

Dentition generally commences about the fourth or fifth month, or even as late as the tenth, and continues till the fifteenth or sixteenth: The teeth appear in the following order; first, the two incisors of the lower jaw, and next the two corresponding in the upper jaw, then the four molars, canini, and last of all their antagonists, or the eye teeth, making in all sixteen:

In this order there are some irregularities; thus, sometimes a child cuts twenty-four teeth at the first teething: Sometimes they cut four double teeth in each jaw, instead of only two:

The progress of dentition in healthy children, is early, regular, and steady; in the sickly, on the contrary, it is slow, and irregular.* The symptoms produced by teething are thus given by Underwood; viz. a great discharge of saliva, swelling, and heat of the gums, "with a circumscribed redness of the cheeks, and eruptions on the skin, especially on the face and scalp; a looseness, gripings; green or pale stools, or of a leaden-blue colour, sometimes mucous, often thick and pastey; watchings, startings in the sleep, and spasms of

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* Underwood.

particular parts; a diminution, or increased secretion of the urine, sometimes of a milky colour, at others, staining the cloths in patches, as if it deposited a brown powder; a discharge of matter, with a pain in making water, (imitating exactly a virulent gonorrhœa) which often mitigates the fever: in almost all cases, the child shrieks often, and thrusts its fingers into its mouth. The difficulty in micturition, however, is sometimes very troublesome, and the pain apparently very great, attended with long and vehement shrieks, for some time before the urine has passed.

"A symptom less common than any of the foregoing, and appearing only in certain habits, is a swelling of the tops of the feet and hands: it is seldom, however, of much importance, and goes away upon the appearance of the teeth. I have never met with it but in infants who cut them painfully; and being seldom accompanied with a purging, it is likely may (in its stead) prevent that fever which is otherwise so apt to attend. In some instances, however, this symptom has been accompanied with considerable fever, but such children have either been costive, or the stools been fœtid and clayey, and the swelling of the extremities very considerable."

TREATMENT.

The principal indication in the treatment of dentition is to keep the child in as good health as possible; its bowels should be kept constantly open by encouraging the diarrhœa, which is naturally present in this process; this may be done by small doses of calomel, a grain every two hours, till the bowels are freely moved: The child should have a healthy nurse, pure air, cleanliness, and a proper temperature, and if the symptoms of any other disease have developed themselves before dentition commences, or if the parents are subject to scrofula, &c. it is necessary to have a regard to it, as this process will invariably aggravate it.

The maxim of Hippocrates, that children cut their teeth more readily in winter than in summer; that such as are inclined to be lean, cut them more easily than those that are fat, should always be kept in view; In fact the whole secret of the medical treatment of children during this period is contained or may be inferred from this axiom; The first part of it, that children cut their teeth more easily in winter than they do in summer, points to the circumstance that all stimuli must be avoided, which will keep the system in an irritable state: The medium degree, with regard to diet, temperature, exercise, &c. must direct us; the temperature of Greece in winter, the place of the above observation, approaches more or less towards 60°, a degree the most propitious to human life; yet, in summer, from the proximity of the great African desert, it is too far removed from it not to have a decided effect in rendering irritable and susceptible of the most violent nervous forms of disease, epilepsy, &c. the delicate frames of children passing through this state: The second part of the axiom gives us a salutary caution with regard to food; the lean pass though it more easily than the fat: The food should be moderate: Nature, in fact, in the salivation, and the bowel complaint, which invariably attend this disease, points out the necessity of keeping children under par with regard to health and strength in treating it; It is, in fact, nothing more nor less than an inflammation of the lining membrane of the tooth, which excites the whole system, and of which the salivation and diarrhœa are attendants, and it is to be relieved by the means which abate inflammation and fever in other parts: The food in the first place, must be very moderate in quantity; the nurse herself must be abstemious; she must not take much meat, fish, flesh, butter, eggs, or any thing alcoholic, acid, or oily; abstain from all indigestible food; keep her mind in a state of tranquillity; exercise in the open air; rise early; take a moderate quantity of sleep; in fact attend in every respect to all those circumstances, which lead to the promotion of her health and strength: If the child is costive, which it will not probably be if these directions with regard to the system of

the nurse be attended to, a dose or two of calomel, as above directed, should be given to it, and afterwards an occasional purge to her by herself will most probably dispose the child to that free state of bowels, which is essential to its health in this state.

When any violent symptoms have come on, as epilepsy, they are to be treated according to the directions laid down in vol. ii. p. 85, in the chapter on epilepsy: If there be fever, it must be treated accordingly; V. S. sudorifics, vin. antimonial, nitre, &c. and purges, clysters, and the warm bath: In order to prevent these most general affections during dentition, a blister behind the neck, or the ears, kept constantly open, will have that effect, or a tartar emetic plaster applied to some part of the surface, as behind the ear, till it irritates it; taking care to keep up the irritation by frequently renewing it, applying volatile liniment on a piece of muslin, as nothing is so safe in preventing the aggravation of this disease, as eruptions on the skin: The bowels also should be kept in a free state of purging; for as long as they are so, there is little danger. Both these evacuations show the importance of keeping the nourishment of the system within bounds, as if the child be lean all these means will be unnecessary: Underwood mentions that he has known a child have fifty stools in one night: he recommends to correct acidity the use of some absorbent as the cretaceous mixture; he gives them with nitre at bed time; and he recommends highly the compound spirit of ammonia in a spoonful of water every four hours, for four or five times after proper evacuations: If the symptoms become dysenteric, then the stools are to be promoted by castor oil, at the same time using means which will allay the pain, as laudanum, &c. but taking care not to suppress the discharge; and always recollecting that proper attention to the diet of the nurse will assist in abating irritation in the system of the child. The practice in this country, where the evil of drinking spirituous liquors affects all classes of the community, of taking great quantities of porter, milk punch, &c. under the plea of supporting the strength of the nurse, must be discouraged, as there can be no question, that it is one source of the great irritability of the system of the child.

This caution is essentially important: Indeed the child, from the excessive inflammatory and irritable state produced by the passage of the teeth, is liable to every form of fever and nervous affection, and on that account the physician must be upon his guard, with regard to every thing which can increase this feverish state. Three or four teeth may be cutting at once; this case must be particularly examined into; and, as Underwood states, in some instances, the fact that more than the usual number of molar teeth occur, must always be kept in view, as symptoms of the most alarming kind may result from the irritation of the additional number, which occasionally appear; thus, he mentions that after the usual period of the first teething, he has met with peripneumonic symptoms, as soreness of the chest, great difficulty of breathing, with loss of appetite, continual fever, and the appearance of general decay, which by lancing the gums, and purging for three or four days, have been completely removed.

With regard to lancing the gums, it should be done frequently when they begin to swell, as the discharge of blood from them often relieves the pain and irritation, even if the teeth should not be near the surface; and as in the molar teeth, the division of the strained periosteum over one of its points, may be succeeded next day by the protrusion of another point, it becomes necessary to repeat it often: the incision should be crucial, and extend quite down to the teeth, which will be known by the grating feel on their surface; in case of convulsions in young children, it should always be had recourse to; Sometimes the irritation is produced when the teeth are very low down in the sockets, and lancing does no good; it is, notwithstanding, an experiment which should always be tried, as there is no other remedy if dentition be the cause: this last remark, shows the weakness, not to say the cruelty, of those who speak of the cutting the gums as useless; the bad effect of hardening them by the formation of scars, &c.

As to the danger of producing caries by the contact of the knife, this is an idle objection; the enamel is too hard to be affected by the best steel, applied with more force than is usually exerted in making the incision. Sometimes, when the teeth are passing, ulcers form on the gums; these are best treated by attending to the general system of the nurse and child.

SORE-EARS IN CHILDREN.

This species of ulcer generally arises either from bad food, bad air, or other causes, operating through the system of the nurse, or directly on that of the child: too much nourishment most frequently produces it; it relieves the symptoms of teething, and if repressed, often produces dangerous bowel complaints: Abstinence to a proper degree, cleanliness, pure air, purges so as to deplete the system, but not abate the strength, are the proper plans; clean dressings of simple cerate, or, as Underwood advises, the following ointment: R. Calomel. ʒi. ad ʒii. Unguent. Sambuci ℥i., m. ft. liniment. The common simple cerate will answer equally well instead of the elder ointment: Tonics may be necessary, as bark, columbo, with carbonate of soda, to correct the bowels, if the habit is in a weakly and bad state.

ULCERATIONS OF THE MOUTH IN CHILDREN.

Inflammation, followed by ulceration of the gums or the parts below the tongue, commencing most usually by salivation, fever, and costiveness, is best treated by general remedies to abate the fever, as sudorifics and saline purges; and then the application of escharotics occasionally, as the blue vitriol, a strong solution of which should be made, and the ulcer gently touched with it with a camel's hair pencil; the very small quantity which will be swallowed by the patient will not do any harm; Underwood recommends the following paste, with which the gums may be touched several times a day, particularly after meals, and on going to bed, and the mouth washed occasionally with the mixture; R. Bol. armen., Gum myrrhæ, Cort. peruv. pulv. Cremor tartari. āā ʒi., Mel Rosæ q. suf. Misce ft. Pasta. R. Aq. Calc. ℥viii., Tinct. Myrrh. Mel Rosæ āā ℥ss. ft. Mistura.

If there is no change for the better in a few weeks, he recommends a dram of alum to be substituted for one of the astringent powders, and instead of the above mixture, one acidulated with as much of the muriatic acid as the parts will bear, occasionally made stronger, till some amendment be perceived, keeping the bowels at the same time properly open: If there be any necessity for internal remedies, Peruvian bark, sarsaparilla, and the mineral acids, will be most proper, with a diet of milk and vegetables.*

The gangrenous erosion of the cheeks, commences with signs of general debility, coldness of the surface, and a black spot appearing upon one cheek or upon the lips, without any marks of inflammation, the whole side of the cheek gradually dropping off, so that the jaw is left quite bare and falls down upon the breast; the child dying by a colliquative diarrhœa, from the putrid discharges which are swallowed: The remedies are bark, nourishing diet, wine, and the use of magnesia and rhubarb, to discharge the impure matter taken into the stomach from the sores. The parts also should be freely washed with muriatic acid, honey and water, and over the whole a carrot poultice: This plan was so successful in the hands of Mr. Dease, that he did not lose a single case but one, after its adoption.†

Gangrene is said to occur in the pudendum, which also begins with a dark coloured spot, without pain, heat, swelling or any mark of inflammation, or fever; it soon destroys the part and the patient dies in a few days; A fermenting poultice,‡ saturnine washes, opium and wine taken internally with bark or other bitters, as the stomach will bear it, are the proper plans; the bowels must at the same time be kept open.§

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* Underwood. † Ibid. ‡ See p. 296 of this vol. § Burns.

This variety of sphacelus arises generally from bad air, or from bad food, and shews a defective state of the general system, which falls upon these parts, because their structure is more tender: It is best treated by the removal of these causes, and the appropriate remedies for a typhous state of the system.

Burns describes a state of the lips, side of the nose and pudendum, which is followed by gangrene: It begins with an itching, swelling and redness of the mons veneris and labia, which are covered with minute blisters or little scabs, or they secrete a serous fluid; paleness, disordered bowels, bad appetite, pulse small and frequent, also distinguish it: Burns recommends a solution of sugar of lead, to which vinegar has been added in small quantities, or Goulard's cerate, and a careful attention to the bowels;

He describes also an inflammation of the labia after scarlatina and measles, with a muco-purulent discharge, the parts being inflamed and livid, and with great pain in passing the urine: the labia, nymphæ soon become covered with small ulcers; the general system is debilitated, with a small and frequent pulse, and depraved action of the bowels: As the disease advances the weakness increases; the sloughs and ulcers spread, and the patient gradually dies: It is at times joined with the disease of the cheek already described, and is very fatal: Cleanliness, the use of mild laxatives, wine and laudanum, to allay irritation; the fermenting poultice, if there is great sloughing, and if it merely amounts to inflammation, lead water, or the ointment of the acetate of lead, or of the oxyde of zinc, are the remedies: Sometimes this disease is also preceded by fever; it is treated in the same way as the above, requiring the use of bark, wine, and other strengthening medicines, attending to the state of the bowels, by keeping them gently open: The symptoms and plans of treatment already laid down under the head of mortification will be sufficient to conduct the patient safely through these local affections, as they are expressions of the state of the general system, and are to be cured principally through it; the use of cleanliness, fermenting poultices to correct the fœtor will be proper, but our main reliance must be upon the plans which correct the health generally as just stated.

INDURATION OF THE BREASTS.

A hardness, pain and swelling occur in the breasts of both males and females, at the age of puberty: In the female breast, sharp points, which are painful on pressure, are felt: The hardness is situated in both sexes around the nipple and behind it: These affections, if they should become excessively painful, may be allayed by leeches and lead water; they in general require no treatment: They are sometimes mistaken for scirrhus or scrofula: Purges occasionally, and a moderate diet also may be tried: In new-born children also indurations occur, which are said to contain milk, and are often injured by attempts to press it out: When this is the case they must be treated by lead water, or a poultice of bread and milk wet with it.

ULCERATION OF THE NAVEL IN CHILDREN.

Sometimes a fungus, which resembles in appearance a cherry, shoots up from the navel, after the separation of the cord, which should come away in from five to sixteen days; the fungus may be removed by applying a ligature round it, and then touching it with lunar caustic; or if it do not protrude considerably, the ligature will be unnecessary; the caustic alone will, by successive applications at the intervals of two or three days, remove it: Sometimes the cord hangs by a slender thread for some days, irritating the part and exciting a serous discharge; it should be divided, and the surface dressed with simple cerate, with a slight pressure by a bandage round the belly: If the navel should again break out after being completely healed, it may be concluded that the general system of the child is in an unhealthy state; and that either the nurse takes improper food, is exposed to the influence of impure air, or is uneasy in her mind, or the child's bowels are out of order and require some gen-

tle purgative, with small doses of salt of tartar, or carbonate of soda; rhubarb in union with these substances will be found to be valuable; it should be gently toasted by laying upon the point of a knife, and exposing over a stove or near a fire till it becomes of a slight brown colour, and then given in doses of two grains every two hours with two grains of salt of tartar, till the stools become natural; or the alkali may be given in the form of castile soap with advantage: This matter, however, has been amply discussed under the head of diarrhœa in the second volume: If, however, there should be excessive discharges, and the debility of constitution be increased by them, astringents will be necessary: The proper state of the mother or nurse must, in all these cases, be ascertained, and the defects of her health properly corrected: Underwood mentions cases in which the ulceration extended over the belly and produced death: The sore must be assisted by the application of caustics, when fungus appears; for this purpose burnt alum made weaker by adding to it an equal quantity of flour, may be sprinkled over the sore every day; if it be not extensive, nitrate of silver will also answer; there is danger, however, of it affecting the system, if the sore be large; in these cases the alum will answer well: The bark, cordial diet, and if the sore be in an irritable state, poultices, as the carrot, or bread and milk, should be applied. If the practitioner recollects that generally a sore is an expression of weakness of the system more frequently than of a part, he will find no difficulty in treating it.

INFLAMMATION OF THE MAMMA.

Cold; moving the arms too much; bruises; disturbance of mind, as fright, &c.; early repression or retention of the milk, are its most frequent causes: The gland, cellular substance, either in a small circumscribed part or more extensively may be affected with redness, heaviness, tension, heat, pain and throbbing, the pain extending to the axillary glands; the milk in some cases continuing to be produced; it most generally attacks pregnant women within three months after child bed; it also occurs in unmarried women, and sometimes in men: The induration may cause it to be confounded with scrofulous and other indolent tumors of the breast; the intensity of the pain, the sudden swelling are all sufficient indications of its nature:

If the system be not plethoric, and the cause has not been violent, as a severe contusion, the inflammation may be repressed, even if two or three weeks have elapsed, but this is a rare case; the stimuli taken too often by women, heated chambers, warm drinks, as coffee, tea, &c., all of which increase the irritability of the system, often give the inflammation a very active character; like pleurisy, it must in its highest degree, be either arrested in four or five days or matter will form: When called early, drawing the milk, suspension of the breast; low diet, as of whey and bread; bleeding from the arm, leeches to the breast till the pain is nearly abated, with saline purges, and then a blister to the surface of the part inflamed, which will sometimes suspend the symptoms, and give the patient a quiet night's rest:

Instead of this active practice, a cold poultice made of bread wetted with lead water or sal ammoniac dissolved in water, has been advised; a blister, however, will be much more effectual, particularly if the inflammation be deep seated: When the inflammation is superficial, warm oil applied by frictions is useful: If, however, it is impossible to resolve the inflammation, then a bread and milk poultice is the best application; the abscess may then be left till it break of itself; if slow in coming to a point, it may be opened at the most depending part, where the matter appears to fluctuate: Sometimes, if opened early some of the large vessels of the breast are wounded; the blood oozes out slowly and the patient dies of hemorrhage;* to stop it, pressure with dry lint must be used: The full discharge of matter in the breast is followed by complete ease; which

* Burns, vol. i. p. 572. Phil. 1823.

is increased by the poultice, continued for several days; if the surface of the breast should be irritable and break out into sores, then mild dressings had better be substituted. The opening when it is made should be free to permit the matter to escape, and to prevent the formation of sinuses; if these form, they should be laid open so as to permit their healing from the bottom: In general, after opening an abscess, when it begins to fill with granulations, the poultice may be left off, and the part dressed with simple cerate:

The milk does not always return; if it does not, the child may be nourished sufficiently from one breast only; Burns describes a variety of this affection, which is owing to scrofula, troubled mind, or neglect of the proper treatment early in the disease: It is known by the following symptoms; repeated and daily shivering fits, followed by heat and perspiration, and accompanied with hardness of the breast; the suppuration is slow, and after the bursting of the abscess, it is again renewed; at some distance from the place of opening œdema forms, indicating the existence of matter deep in the breast, which on pressure is discovered to be there, by the fluctuation: It must be examined once a day as it may become distinct rapidly, and it must be opened as soon as it does; other collections always form, which must also be opened, every sinus being freely dilated: and as soon as matter appears it must be discharged. If this be neglected, Burns states, that other sinuses form, and the patient is seized with daily shivering fits, with sickness and vomiting of bile, diarrhœa, cold perspiration, a dry or scaly state of the skin, with an affection of the glands of the mesentery, uterus, and a discharge of matter from the vagina: the pulse is frequent, becomes feebler, and the patient at last suffers under a variety of afflictions and dies: Burns states that these abscesses heal rapidly, and as soon as one is well another begins to suppurate. The plan he recommends, is a nourishing diet, with wine, of such a kind and in such quantities as will best agree with the stomach and general system; A blister to the surface of the breast, in this case is indispensable: it will prevent the formation of new abscesses and arrest the irritation: he recommends opium to arrest the diarrhœa; the nervous feelings and debility produced by opium, though it may form a part of the treatment, must prevent us from relying wholly upon it; on the contrary, by the use of solid food, such as rice, tapioca, avoiding liquids and oily food, at the same time taking care that it be not too stimulating, assuming digestible vegetable articles and omitting animal matters, when fever appears to be present; in general, it will be found, that when the blister has drawn completely the fever will subside: the irritation must be accordingly kept up, so as to prevent the formation of new abscesses within; As soon as the patient will take a sufficiency of nourishing food, with the above precautions, to translate the disease to the surface, he will grow better: The free opening of the sinuses must not be forgotten: in those cases where there is little constitutional affection, and the sinuses are indolent, if deep seated, a seton should be passed, and if they are superficial, they should be laid freely open:

To remove indurations gently stimulating liniments, as the volatile liniment; camphorated spirits of wine; camphorated mercurial ointment; cicuta poultices: all of which have a tendency to bring the inflammation to the surface, and thus remove the cause on which it depends:

Mr. Hey describes an abscess of the breast, which is deep seated, and occurs in men as well as women; the formation of matter is tedious, and when it finds its way outward, the discharge still continues, with intervals of schirrous hardness between the openings; and when the sinuses are opened, a purple fungus rises from them, hectic comes on, in consequence of their not healing, and continues a long time: The only successful plan of treating these sinuses is to lay them fairly open, and where they run into each other to remove the piece of breast insulated by any two of them; the wounds heal up directly, preserving the form of the breast completely.* After recovery, it is necessary to

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* Hey, quoted by Cooper.

protect the breast from the cold, as relapses are likely to take place; as it recovers it swells generally at night and becomes œdematous: When a relapse takes place, the tumor is deep seated and indolent, with little pain from the preceding debility; it, however, at last comes to more active inflammation, poultices are necessary and the abscess bursts;* It is to be treated according to the above directions.

Sometimes inflammation of the breast is confined to the surface on and about the nipple; it is much irritated by frequent sucking, and arises often from an aphthous state of the child's mouth; it may in some instances be prevented by washing the nipple and surface around it with spirits of wine for some time before delivery; after it has taken place, the breast should be irritated as little as possible by suckling the child by a nurse through the night, or nourishing it by the spoon, drawing from the breast only as much as will prevent it from inflaming: Lotions of lead water, of sulphate of zinc (one gr. to the oz. of water), of nitrate of silver (one-fourth of a gr. to the oz.), diluting it to such a degree as to excite a small degree of smarting; borax and water will also be useful: Simple cerate, spermaceti ointment, or simply sweet oil, or fresh hogslard, will be valuable applications: Sometimes the citrine ointment largely diluted, red precipitate ointment, are also good:†

An artificial nipple made of gum elastic, put over the natural one, or a tin case to cover or to defend it; broad rings of lead or ivory put over it; if the child cannot use the nipple made of gum elastic, then a small polished case made of wood, and covered with any soft substance to defend the gum, will answer the purpose.‡

FŒTID DISCHARGE FROM THE NOSE.

This complaint generally appears in children, and does not get well till puberty: it is sometimes an affection of the soft parts, and sometimes the bones are involved; in the latter case, it is more difficult to cure; it is to be treated on the same principle with all other ulcers; a blister should be applied behind the ears, to translate the morbid disposition to that part; the quality and quantity of food should be reduced, as it originates frequently in a plethora, any error with regard to air, exercise, &c., both in the child and nurse, should also be corrected, and in case of debility in the child, the use of tonics, as bark properly combined with salt of tartar, (in the dose of eight or ten grains of the former to two or three of the latter) repeated three times a day, and purgatives occasionally if it should still be too plethoric, should be advised.

Stimulating injections, as a weak solution of burnt alum; or simple water to keep the parts perfectly clean; lime water and common water in equal parts, and if the ulcer is near the surface it may be touched with equal parts of citrine ointment and simple cerate melted together; recollecting always, that when an ulcer takes place in any part of the body, if there be no foreign body present to keep up the irritation, as diseased bone, &c., it most probably originates in some defect of the constitution produced either by improper diet, or some error in the mode of life.

ULCERATION OF THE LABIA.

This is the result of uncleanliness; the surface is excoriated, and the labia often adhere: this is prevented by putting between the sides of the vagina a pledgit of lint smeared with simple cerate; if they adhere completely, they may be separated by gently pulling the parts asunder, and dressing them as above, and if this be not practicable, they may be divided by the knife, and dressed as before directed: When violent itching is complained of in these parts, washing with lead water or a weak solution of corrosive sublimate in water (as half of a grain to ℥viii. of water,) after thoroughly cleansing them with soap and

* Burns, vol. i. p. 574-5. † Ibid. ‡ Ibid. p. 576.

water, will generally remove it: Mr. Burns describes several species of ulcer on these parts, which deserve to be attentively studied.

"Sometimes, says he, we meet with deeper ulcerations, which it is of great importance to the domestic happiness of individuals to distinguish from chancre. Nothing seems easier in a book, than to make the diagnosis, but in practice it is often very difficult. A well-marked chancre begins with circumscribed inflammation of the part; then a small vesicle forms, which bursts, or is removed by slough, and displays a hollow ulcer, as if the skin had been scooped away or nibbled by a small animal; its surface is not polished, but rough, and covered with pus, which is generally of a buff or dusky hue; the margins are red, and the general aspect of the sore is angry. But the most distinguishing character of the chancre is considered to be a thickening or hardness of the base and edges of the ulcer. The progress of the sore is generally slow either towards recovery or augmentation. When remedies are used, the first effect produced is removing the thickening by degrees, and lessening the discharge, or changing its nature, so that the surface of the sore can be seen; it has then in general a dark fiery look, which continues until all the diseased substance be removed, and the action of the part be completely changed. Now, from this description, we should, it may be supposed, be at no loss in saying, whether a sore were venereal; but in practice, we find many deviations from this description. The thickening may be less in one case than another, and may not be easily discovered, yet the sore may be certainly venereal. Peculiarity of constitution, or of the part affected, can modify greatly the effects of the virus. There may be extensive inflammation, or phagedænic ulceration; and yet the action may be venereal. It is, however, satisfactory to know in these cases, that in a little time, unless extensive sloughing have taken place, the appearance of the sore becomes more decided, the proper character of chancre appears, and the usual remedy cures the patient.

Phagedæna is a very troublesome, and sometimes a formidable disease, especially to infants. I shall here only notice that form which appears in adults, and which, as it is infectious, may be mistaken for syphilis. It commences with a livid redness of the part, succeeded speedily by vesication and ulceration, which extends laterally, and sometimes penetrates deep. The ulcer has an eating appearance, is painful, discharges a great quantity of matter, and very often is attended with fever. A variety of this disease is attended with superficial sloughing, which may be frequently repeated; and is generally preceded by a peculiar appearance of cleanness in the sore. This is not to be confounded with sloughing, produced by simple inflammation or irritation of the parts, which is similar in its nature and treatment to common gangrene. We must foment the sore with decoction of camomile flowers, mixed with a little tincture of opium, and then apply mild dressings. Rest is essential to the cure: and if a febrile state exist, it is to be obviated by laxatives, acids, mild diaphoretics, and decoction of bark. If there be no fever, mercury, or the nitrous acid, often effectually change the action of the parts.

Sometimes irritable sores appear on different parts of the labia, or orifice of the vagina, in succession, healing slowly one after another. These have an inflamed appearance, the margins are sometimes tumid, and the surface is at first irregular and depressed, but afterwards it forms luxuriant granulations. There is another sore met with on the inside of the labium, and which generally spreads to the size of a sixpence. The surface is quite flat, and sunk a little below the level of the surrounding parts. The margins are thickened, and sometimes callous, the discharge thin, and the ulcer not in general painful, the surface soft and spongy without a hard base. These sores generally agree best with stimulants, especially caustic and escharotics. When they do not yield to this treatment, it will be proper to have recourse to a cautious course of mercury. Some of these, like the phagedæna, are infectious.

Some of these sores are occasionally productive of secondary symptoms, such as ulcers in the throat. When these succeed a sore which has run its course differently from chancre, and been healed without the use of mercury,

it is allowable to suppose, that they also may be cured, merely by attending to the general health, and perhaps by local applications. But if they continue without amendment, or threaten danger to any important part, we must not delay making trial of mercury."

ON ULCERATIONS OF THE OS UTERI.

When a simple sore occurs in the organs of generation, which is attended with pain on pressure by the finger or in coitu, mild injections and keeping the parts perfectly clean soon relieve it.

ON THE CORRODING ULCER OF THE OS UTERI.

Dr. Clarke describes an ulcer of the os uteri, which usually appears about the period at which the menses cease; the uterus at this time is generally larger, owing to the cessation of the secretion: This ulcer commences with extraordinary heat, more particularly in the upper part of the vagina; a yellowish discharge in small quantities takes place, which is sometimes streaked with blood; the sensation of heat becomes glowing, and the patient feels as if there was a coal of fire in her inside; the discharge increases; the face is pale with great weakness: there is no lancinating pain in this disease as there is in cancer of the womb; the pain of the corroding ulcer of the womb is by no means of an intense and acute kind; the patient does not complain of it, even when the finger is passed over the sore, as is invariably the case in carcinoma of the womb: the part feels simply sore in the corroding ulcer: The patient does not die so soon with the latter disease as with cancer.*

TREATMENT.

Bleeding by cupping or leeches should be prescribed as soon as the patient feels the burning heat in the womb, or parts adjacent to it: it should be repeated every week or ten days till the heat is removed, and if not sufficient, no blood should be taken from the arm, as it will generally only increase the debility without relieving the patient: the hip bath should be used, heated to a degree not exceeding 94 degrees of Fahrt.; the temperature should not be so low as to excite chilliness; the water may at the same time be thrown into the vagina, which should be practised also in the ulcerated stage: If the hip bath be not convenient, spunges wrung out of warm water will answer: Solutions of glauber or epsom salts in the dose of 20, 30, or 40 grains twice in 24 hours, made up with small doses of the extract of hemlock or of hyoscyamus, and rendered agreeable by the addition of some aromatic water, may be taken; if nausea be produced, it may be checked by the addition of four or five drops of laudanum to each dose: The diet must be strictly antiphlogistic; and anything that can excite the local action of the parts must be avoided: When the ulceration is advancing, mild astringent fluids to abate the discharge must be thrown up, and if hæmorrhage arise in its progress, solutions of sulphate of copper, or nitrate of silver, (a grain to the ounce, or weaker if painful,) may be injected: The horizontal posture must be preserved; the bark, with the sulphuric acid may be given to support the strength, and such diet as is most nourishing and will best agree with the patient.†

There is another ulcer, which is hollow, glossy, and smooth, with hard margins, and the parts of the cervix around it indurated and somewhat enlarged, whilst the other parts of the uterus are healthy. The discharge is serous and sometime purulent; the pain is constant but not acute, the disease advances slowly and kills by hectic.‡

Local bleeding, the hip bath, saline purges, and spare diet, have been tried, but they are of little use.

The warm salt water bath has been used with more success; leeches to the groin, with gentle laxatives, have succeeded better. When the ulcer is small and the parts simply indurated, these remedies also succeed well. In this stage, there is generally leucorrhœa, and pain in the region of the uterus. A salivation is sometimes useful, but it must be watched, as it may hasten ulceration.

* Clarke, p. 274-80. † Ibid, 274-9. ‡ Burns.

CHAPTER VI.

OF ULCERS IN GENERAL.

Ulcers occurring in a Healthy System—with an Action weaker than Health—with an Action Stronger than Health—with a Specific Action.

An ulcer is a surface deprived of its natural covering, secreting matter: The word sore expresses its meaning: It is produced either by the system causing an absorption of a particular part, as in the case of a piece of dead bone making its way to the surface; a tubercle in the lungs irritating them; or by external violence, as in contusions, splinters, wounds, &c. The state of a sore is varied, first by that of the system; secondly by the nature of the irritant, which acts locally upon it; or thirdly, by both combined.

Sores may present either the action of health, the system being in an excellent state, and there being no local cause to prevent their healing; or they may be below the standard of health, the parts being too weak to carry on the necessary process of restoration, or they may be above par, be in a state of inflammation, or they may be under the influence, either of a specific poison, acting locally, as in the case of a wound from dissection, or through the general system, as in the venereal.

ULCERS OCCURRING IN A HEALTHY STATE OF THE SYSTEM.

An ulcer occurring in a healthy system, has the following appearances: the surface of the sore presents a number of granulations, or small conical protuberances, of an equal height, and rising a little above the edge; with a discharge of cream coloured pus covering the bottom of the sore; the expression of the face is that of health, generally that of good nature, or contentment, and the sore grows smaller every day; all that is necessary in this case is to leave nature to herself, taking care to prevent any local or general disturbance to the system; the application of dry lint upon the surface to absorb the matter, and over it a pledgit of simple cerate, or fresh hogs lard, to keep the air from it, is all that is necessary, taking care to avoid pressure by tight ligatures of any kind about the limb: Sometimes, if a bandage is applied too tightly, it destroys the healthiness of the sore; any thing in fact, which weakens the actions of the part, lessens the propelling power of the arteries, or of the veins, must alter its healthy appearance: In some patients the arteries are more disposed to act too strongly, in others the veins are defective and do not carry on the blood with sufficient rapidity, and in particular those upon the surface, which has the effect of distending the vessels of the sore, and of preventing its healing. In men who live too freely, the arteries are excitable when they are under the influence of stimulus, and when it has ceased they are more languid: the last is true of old people: Other assistants in such cases are required: When the arteries are too excitable, from any cause, rest with the limb raised; and when the veins do not perform their functions, the support of a bandage regularly rolled from the foot upwards to the knee; the idiosyncracies of the parts must

also be studied; If the patient has got well before under a particular dressing, that should be first tried; if greasy dressings irritate the skin, they must be changed, and the sore exposed to the air.*

Mr. Home recommends as the best application to healthy sores, the simple ointment made of white wax and sweet oil; it must not be rancid; he objects to applications in the form of vapor, and fomentations. If it be intended to form a scab on the ulcer, the use of some dry powder, as chalk, lapis calaminaris, or what is better, dry lint, must be preferred; the lint or powder must be protected by laying two little bolsters on each side of the sore, fastening them on with a bandage so as to prevent the scab from being rubbed off: lint, however, Mr. Home says, is to be preferred: After laying in bed for some time both the arteries and veins become weak, and require the support of a bandage; this is the case particularly in the aged and intemperate.

OF ULCERS WITH AN ACTION WEAKER THAN THAT OF HEALTH.

The granulations in this kind of sore are glassy, flabby, bloodless, semitransparent, and disposed to rise above the surrounding skin; suddenly after filling up the ulcer, they are absorbed, and leave it just as before; or if they still keep their level, they are found to want the power of forming skin; this last is always a sign of this kind of ulcer. This state of things may arise from causes affecting the mind, as grief or despondency; or the bowels may be out of order; frequently the stools become black, like tar, and the ulcer does not heal till they are corrected: for this purpose, purgatives of rhubarb and carbonate of soda will be found the most effectual; R. Rhei. ʒii. carbon. sod. ʒiiss. aq. fluvial. ℥vi. m.—Dose, a table spoonful every two hours till the stools become natural: or the patient may take of ℥ss. of rhubarb and charcoal in fine powder, and mixed, a tea spoonful every two hours till his bowels become natural, attending at the same time to his diet, which should be mutton, beef, and fowls, broiled; and if he has been accustomed to stimuli, he may take a pint of beer, in the day, or some wine and bark; but if this diet should be too stimulating, as will appear from the surface of the sore becoming inflamed, he must substitute the farinacea for the above plan, and confine himself to bed with his leg raised.

In general, this state of ulcer occurs in delicate and weakly people. The weather has great effect upon the appearance of this kind of sore; moist weather makes the granulations flabby and weak, whilst dry restores them; in persons of robust habits the changes are not so easily perceived.* The patient should strengthen his system by every means in his power; his mind must be kept easy; he should take gentle exercise, the limb being covered with a bandage, nicely put on from the toes to the knee, avoiding wrinkles: sores that heal under this plan do not break out so easily as those which get well when the patient is confined to bed; the best plan therefore is to correct the state of the general system, and when that is in proper order the sore will generally heal with but little difficulty. Certain applications have a direct effect in weakening the granulations in sores of this character; as poultices, washing with hot water, fomentations, and generally all ointments; the latter, however, are sometimes very useful.

A solution of nitrate of silver, half a gr. to the oz. may be applied often with good effect; or of blue vitriol in about the same proportions; a small piece of lint may be wet with it, first cutting it to a size smaller than the sore, and laying it over its surface, and over that a small plaster of simple ointment. If the granulations are flabby, and rise above the sore, they may be touched round the edge with a little lunar caustic, cautiously avoiding to touch the edge of the skin newly formed; a piece of lint may then be laid over the centre of the

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* Home. † Ibid.

sore, and the whole covered with a bandage, beginning from the toes and extending up to the knee.

Mr. Home recommends the use of spirits of wine and the decoction of poppies, in equal proportions, to be applied cold to these sores; plaster of paris, chalk, lapis calaminaris, powdered bark, recommended highly to be sprinkled over these sores, Mr. Home thinks of no use; powdered rhubarb he thought more valuable than any other powder: when it was too stimulating he mixed it with a fourth part of crude opium in powder; a piece of lint a little less than the sore is to be put over the powder, then a plaster of simple cerate and after it a bandage as before directed.

The red precipitate ointment is one of the best applications, which can be made to a sore; it may be made by mixing the common red precipitate ointment in the proportion of two parts to eight of fresh hog's lard, or simple cerate; Astley Cooper says, that there is but one objection to its use, which is that it thickens the cuticle just formed on the edges of the sore, and prevents the healing process; the edges of the sore look white after its use; the strong mercurial ointment applied upon the edges corrects this defect: Solutions of the sulphate of zinc, in the proportion of two grs. to the oz. of water; or the sulphate of copper (one grain to the oz.) are proper; corrosive sublimate (one grain, to an oz. of lime water) is also recommended by Cooper for the same objects: lotions are more cleanly, agree better, and are applied more completely to the surface of a sore, than ointments. The adhesive strips applied so as to draw the edges of the sore together, have an excellent effect in healing ulcers; by drawing the sides of the sore together, as if it were a recent wound, they supply the place of the skin which is wanting, by stretching the old over the sore: The emplast. galbani composit. Cooper proposes as a substitute, when the sores are very languid. The adhesive plaster as above mentioned has the effect of stimulating the surface of the sore, and succeeds in almost all ulcers of an indolent character.

INDOLENT ULCERS.

These ulcers properly fall under the same head with those which have an action weaker than that of health. Thick, prominent, smooth and rounded edges; the surface of the sore smooth, level and glossy; pus thin and watery or mixed with coagulating lymph, in flakes, not easily separated from the sore, are the characters ascribed to this variety: It may be considered more properly as a chronic state of the ulcerative process, for all sores end, if they continue long enough, in this variety: Like the first variety of ulcers with weak action, the granulations are suddenly absorbed, after the sore has appeared to be doing well, from the effects of despondency, fatigue, of the weather, or any cause, which weakens the powers of life: This form of ulcer generally results from excesses; poultices, as the bread and milk, and that of linseed meal, are the best dressings; they stimulate the surface, make the granulations grow and fill up the sore; this growth is, however, weak, and requires the application of certain stimuli, in order to strengthen and render the cure durable; the poultices should be applied twice a day; the mode of making them has been already described in p. 292 of this volume, and in the intervals of their application the sore may be fomented with the decoction of chamomile, or warm water.

A solution of nitrate of silver (one-fourth of a grain to the ounce of water) may be applied to such ulcers, and the strength of it may be gradually increased with good effect; or the surface may be touched simply with a piece of lunar caustic; Mr. Home recommends a scruple of nitrous acid mixed with eight ounces of water to be applied upon the surface of the sore; it gives pain at first, which lasts about half an hour and then ceases; it cicatrizes the sore more rapidly than when other caustics are used:

When a piece of bone is exposed, which is not removed by the absorbents, Mr. Home states, that the nitric acid removes its earthy particles and permits the vessels to effect its absorption more easily: Any caustic, which can conve-

niently be applied, will answer equally well, as the blue vitriol, the red nitrate of mercury, or lunar caustic; they require to be changed frequently, for it will be found, that after one has been applied successfully for some time, it will lose its virtue; another will then afterwards succeed well: The use of these medicines is to stimulate the blood-vessels to act with more vigor on the surface of the sore; far removed from the heart the small vessels do not partake of its impetus; it is, therefore, necessary to excite them, either by a local stimulus or by means which affect the general system. Ointments agree well with these sores; one part of the red precipitate ointment with three of hogs-lard, is said to be an excellent application to them: it removes the thickened edges and brown colour of the skin surrounding them; under its use the granulations become small, firm and healthy: like all other applications, however, it requires to be changed, or increased in strength: Dressings made of the other metallic preparations, as the unguent. citrinum, may also be tried: the unguentum resin. flav. unguent. elemi. are also used: Home recommends the copaiba, and balsam of turpentine; they all act in the same way, though some, as the red precipitate, are more useful. As the ulcer is weak in its powers of restoration, principally from the defect of the general system, we must try to strengthen it as much as possible by exercise, by attending to the bowels, by the administration of calomel in small doses, to stimulate but not to excite salivation; by the use of bitters; by living in a pure air, and keeping the mind easy:

In order to exercise with safety, it will be necessary to apply a bandage from the foot to the knee to support the blood-vessels, but more particularly the cutaneous veins, which not being able to carry on the blood, cause the skin about the sore to be of a brown colour; with this support, exercise forces the blood through the arteries, and the sore heals rapidly: The bandage used is recommended by Mr. Whately to be of flannel, of about six yards long and four inches wide, to allow for shrinking in washing, for those who have large legs, and three inches for those who are more slender; the flannel should be fine, soft and open; it should not be washed in very hot water, to prevent it from shrinking, and when it is washed it should be hung up immediately; the roller thus prepared must surround the limb from the toes up to the knee, compresses being laid over the sore, after the proper dressings, in such a manner as not to press upon the skin in creases, so as to produce blisters on its surface: With a bandage properly applied the sore will be found to heal rapidly. The plan proposed by Baynton of drawing together the edges of the sore with adhesive straps, answers the same purpose.

ULCERS WITH AN ACTION STRONGER THAN HEALTH.

These ulcers include those termed irritable and inflamed. The surface of an ulcer with an action stronger than health is covered generally with a brown or whitish spongy incrustation; the discharge is serous and tinged with blood; the surrounding parts are highly inflamed; the ulcer also is made up of concavities of different sizes; the margin is rough, jagged and irregular, with an undermined and sharp edge; the surface is excessively painful, and easily bleeds on touching it; the pain sometimes returns in fits, with spasms of the leg, more particularly in the evening and at night: Ulcers seated over ligamentous or tendinous parts most frequently have this character, as over the patella on the anterior surface of the tibia, or malleolus externus; here the nature of the parts give a character to the sore:

If the system be in a very irritable and inflammatory state, bleed at the arm to 10 or 12 ozs.; purge freely with salts, and take away some blood with leeches from the surrounding surface, if highly inflamed, with the use of vegetable food, as rice, tapioca, mush and milk; the limb also must be kept perfectly at rest, with the foot raised a little above the level; but if the patient has been accustomed to stimuli, they must not be entirely kept from him: a dose of laudanum occasionally will be proper to allay irritation; By this plan, the sore will soon have a healthy aspect; it may be assisted by the following local applications.

Mr. Home speaks highly of the vapour of spirits and water directed on the sore: fomentations containing opium, as the tincture of opium applied by dipping it in flannel, wrung out of warm water; or flannels wet with a warm solution of the extract of opium, or with a decoction of poppy heads, hemlock leaves, chamomile flowers, or the tops of wormwood, treated in the same way also answer well: These preparations weaken the inflammation; opium allays the pain, and thus the effect of the sore upon the system is lessened, and the healing process advanced: Most physicians rely upon the local applications as the principal means; a sore is as much a disease which arises out of, and is connected with all the changes of the general system, as a pleurisy or any other phlegmasia, and is to be treated by addressing our remedies to the general system: In general, surgeons treat them, as if they had no connection with the system at large: If the system is treated properly, there will be little occasion for local means beyond rest, seclusion of the sore from the air, or other irritants.

The poultice of bread and milk, of lintseed meal with a little oil, or a decoction of poppy heads; a poultice made by grating carrots into flour and wetting them with warm water, are useful in inflamed sores: Astley Cooper recommends the following ointment as useful; R. Unguent. cetacei, unguent. hydrargyr. mit. āā ℥ss. pulv. opii ʒi. m. f. unguent. It must be spread on lint and applied to the sores twice a-day; or a lotion composed of lime water, mucilage and opium in preference to the ointment: "It is applied on lint or soft linen to the ulcerated surface and a portion of oiled silk or a light poultice is placed over it to prevent the lint from drying: In preparing the lotion, the opium must be dissolved in the lime water, and the solution is then to be filtered, after which the mucilage is added; the proportions are as follows: R. Liq. calc. ℔i. extract. opii ʒi. mucil. acac. ℥ii. m. f. lot."*

Lotions and ointments are preferable to poultices, from the weight of the latter; if the limb could be so placed, that it would rest upon the poultice and not the poultice upon the limb, it would be better; Mr. Home describes a variety of the inflamed ulcer, with which poultices do not at all agree, attended with a mottled, discoloured state of the limb, for some distance from the sore, a coldness of the lower part of the leg; they are often disposed to mortify, a circumstance which is much favoured by hot poultices:

Lint dipt in a decoction of cicuta, of opium, of the compound water of acetated litharge; or a diluted solution of nitrate of silver, (one-fourth of a grain to the ounce) do good in this case. Colica pictonum has sometimes resulted from the long continued application of lead water to the surface: The pressure of bandages is generally hurtful to irritable sores, as also are powders sprinkled on their surface. Opium applied on the surface of these sores has sometimes excited violent inflammation, and even mortification:

In general I think it will be found that rest, the foot and leg raised; the recumbent posture; bleeding locally and generally if indicated by the state of the pulse; a mild dressing, as a lintseed poultice, or, as Mr. Home recommends, the application of cream to the surface of the sore, or some other mild dressing, will cure almost any inflamed ulcer; or, in other words, one whose action is stronger than that of health: Astley Cooper strongly recommends calomel and opium, in the dose of a grain and a half of calomel every night, and a grain of opium every morning and evening: it must not be carried so far as to excite salivation, but only to alter the secretions: The compound decoction of sarsaparilla is also recommended· Cooper does not think much of it in ulcers:

The use of mercury as an alterative cannot certainly be too highly praised in all local inflammations, which, like this, are always connected with a state of constitution highly phlogistic, the result of intemperance or some other ex-

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* A. Cooper's Lect. p. 194.

cess: The depleting plan, however, before advised, should be previously resorted to:

When the edges of a sore become thickened and hard, the plan of Mr. Baynton, of approximating them by adhesive plaster, will answer well; it will not be possible, however, to apply it, if there exists any inflammation in the sides of the sore; scarifications of the edges with the lancet, or the application of strong mercurial ointment, or the ointment of cantharides, or a common blister over the sore will then be useful.* The plan above recommended being practised before, will secure the advantages of this application: When the edges of a sore are everted, poultices are the best remedy, and the bad state of the system should be corrected: When they are inverted, the application of nitrate of silver to the edges, and the black mercurial wash, one drachm to six ounces, to the surface of the wound, have a good effect.†

ULCERS WITH A SPECIFIC ACTION EITHER GENERAL OR LOCAL.

Very often indolent ulcers get well speedily by the action of mercury, when no other plan will do them any good; it is impossible to say what these are from any symptom they may present; in a general way, when ulcers do not improve, it is proper to give mercury or some stimulus, which will excite the system and bring about a change in them. Ulcers often are not made better during the operation of mercury, but get well as soon as its effects are over; mercurial frictions are then the best means as they do not disturb the stomach.‡ Mr. Home describes ulcers on the instep and foot as deriving benefit from mercury: they have a very thickened edge, and are attended with a diseased state of the surrounding skin, resembling elephantiasis; they affect servants, who live in opulent families, in indolence and luxury: fumigations with hydrargyrus sulphuratus ruber cure these ulcers; in some cases, an ointment of calomel and hog's lard also does good; in others, the camphorated mercurial ointment; or a solution of one grain of the corrosive sublimate to an ounce of water, with a little spirit: Mr. Home describes many ulcers which are benefitted by particular remedies; like the peculiarities of constitution they are, however, endless; it is only sufficient to state, that after trying the usual modes addressed to the general system, they may be used as a last resource: Fowler's solution, hemlock internally and externally applied; sea water as a poultice; the narcotics, hyosciamus, and atropa belladonna are praised.

Varicose veins, from the retardation of the blood in them, prevent the healing of ulcers; ulcers affected from this cause, have the look of an indolent sore, are oval, seldom deep, and spread along the surface, with a pain extending along the veins, which is increased by keeping the leg long in an erect posture. Pressure and support on the veins by a tight roller will succeed in this kind of ulcer.

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* Cooper. † Cooper's Lectures, p. 211. ‡ Home.

CHAPTER VII.

PHRENITIS AND HYDROCEPHALUS.

Acute Idiopathic Phrenitis of Adults—Chronic Phrenitis—Symptomatic Phrenitis—Delirium Tremens—Its Symptoms, Nature, and Treatment—First Notices of Hydrocephalus, or Infantine Phrenitis—Its several Stages described—Variety in the Symptoms—Disease of the Ear, with inflamed brain—Disease of the Nose, bones of the head, &c. with inflamed brain—Duration of the Disease—Prognosis—Diagnosis—Appearances on Dissection—Pathology—Treatment of Hydrocephalus—Remarks on the Chronic and Congenital Hydrocephalus.

ACUTE PHRENITIS OF ADULTS.

Phrenitis, or acute idiopathic inflammation of the brain or its membranes, is a disease so singularly modified in its principal features by the circumstance of age, as to require that it should be considered separately as it occurs in adults and in children. The distinction between *phrenzy* and *water in the head* is acknowledged by sound pathology as well as by the world at large; but the former teaches that the two diseases run into each other by insensible degrees, and that the generic term phrenitis is strictly applicable to both. The former is an acute, the latter a subacute inflammation.

The acute idiopathic inflammation of the brain in adults first engages our attention. This formidable disease is characterized by the following symptoms: violent inflammatory fever, redness of the eyes and face, intolerance of light and sound, great headache, with extreme restlessness, and, above all, early and fierce delirium. A very peculiar disposition to *self-injury* may be remarked in the progress of this disease. The patient obstinately shuts his teeth, and refuses both sustenance and medicine. If a penknife or razor be at hand, he frequently, and often too successfully, attempts his own life. Acute phrenitis, as it occurs idiopathically in hot climates, has frequently been traced to excessive fatigue, under exposure to the rays of a vertical sun. In this country it is occasionally observed originating in anxiety

of mind, or in a plethoric habit of body from the inordinate use of spirituous liquors. Genuine phrenitic inflammation occurs too as a consequence of erysipelas of the face, and of small pox; but upon the whole, it is much more commonly the result of fractures of the cranium and other violent external injuries; and comes therefore more within the province of the surgeon than of the physician.

It is generally preceded by temporary loss of recollection, uneasy or disturbed sleep, pains in the back of the neck shooting into the head, suppressed urine, and irregular pulse. The eyes sparkle, the pain increases, the ideas become confused, and the inflammation of the brain is thoroughly established: Violent fits of passion, sudden exposure to cold after great heat, excess of venery, suppressed menses or piles, various kinds of poison, want of sleep, exposure to intense light, also produce it. It arises in its sympathetic form, as a consequence of synocha, of worms, and hydrophobia. Sometimes it is epidemic and produced by filth among the poor. Saalman records a history of this kind. It is apt to recur in the predisposed.*

The acute phrenitis of adults is a disease of great danger, and it may commence in any of the textures within the cranium. Some pathologists have recently attempted to distinguish, by the peculiar train of symptoms during life, the structure principally implicated, but I believe without sufficient grounds. Various morbid appearances have been noticed after death, depending for the most part on the character of the affected structure, of which the following are the most important. When the dura mater is inflamed, effusion of coagulable lymph sometimes takes place, and adhesions form. At other times, pus is found covering a portion of the membrane; or the membrane itself is eroded by ulceration; but this latter occurrence is by no means frequent. Inflammation of the pia mater, when it runs high, generally proceeds to suppuration:—that of the arachnoid membrane to thickening of its structure, and serous effusion. Inflammation of the *substance of the brain* seldom extends over any large portion of that viscus. Its usual termination is in abscess.†

We believe that phrenitis is usually under the command of the antiphlogistic means like any other inflammatory disease, provided that means be used commensurate to the exigencies of the case in the first instance. It is nevertheless true, that the probability of recovery depends upon the degree of injury inflicted upon the sensorium.—Inflammation of the brain itself, terminates in abscess, probably for want of sufficient depletion, whatsoever cause may have induced it. We find it in the yellow fever, and occasionally in mania. P.

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* Philip, ii. 112, Lond. 1813.

† The reader should not fail to consult the splendid work of Dr. Hooper, entitled, "The Morbid Anatomy of the Human Brain." The effects of phrenitic inflammation are there exquisitely delineated in a series of coloured engravings.

DIAGNOSIS.

Phrenitis is distinguished from mania by the intensity of its symptoms; the suddenness of the attack, the violence of the fever, by the throbbing of the arteries and beating of the temples, which occur in phrensy; the fulness of the features and eyes, redness of the face are also striking symptoms in phrenitis. In the delirium of low fevers these last symptoms are wanting, for the face is shrunk, sallow, pale, and the eyes are glassy, which sufficiently distinguish it from phrensy. The idiopathic form is distinguished, by the symptoms of phrensy appearing first. In the symptomatic it follows another disease.

PROGNOSIS.

Convulsions, palsy, coma, insensibility, or great prostration of strength are unfavourable symptoms: the disease often terminates by the fourth or eighth day; the abatement of the general fever, of the delirium, of the sparkling fury of the eye, of the dryness of the skin, show that the patient is likely to recover: a diarrhœa, discharge from the nose, from the hemorrhoidal vessels, from the lungs and urinary organs, is often critical, particularly if the pulse abates in frequency, becomes softer, and loses its febrile character. C.

TREATMENT.

The treatment of genuine phrenitic inflammation is to be conducted on the common principles; but the measures of depletion must be prompt and vigorous, proportioned to the violence of the symptoms, and the importance of the organ attacked. Twenty ounces of blood should be taken from the arm in a full stream, and repeated as circumstances may require; or the temporal artery may be opened, which in this violent disorder is occasionally very serviceable. Purging by jalap and calomel is to be steadidly pursued,—R. pulv. jalap. gr. xx. hydrargyr. submur. gr. iv. m. f. pulv.; or by the following mixture, R. infus. senn. comp. ℥v. potassæ tartrat. ℥i. tinct. jalap. et tinct. sennæ ℥ss. syrup. rhamn. ʒiii. m.; take a fourth part for a dose, and repeat it every fourth hour until it operates. The head should be shaved, and kept cool by ice, cold water, or this lotion, R. liq. ammon. acetat. ℥iii. spir. vini ℥i. aq. fontan. ℥xii. m. f. lotio. The strictest quiet is to be enjoined, and the patient closely and uninterruptedly watched.

The blood must be drawn rapidly from a large orifice, and in an erect posture, from the jugular vein or the temporal artery; and when the pulse rises it must be repeated, and in quantities sufficient to keep down the local symptoms; If the patient should be much weakened by the first bleeding then leeches or cups should be applied to the forehead and temples, and thus the symptoms may be arrested:

Sims states, that bleeding to 12 or 14 oz. from the temporal artery he found better than 30 oz. taken from the arm: It may be easily stopped by a cent folded in a compress and tied firmly on the orifice: He also tells us that free livers, especially those who drink spirituous liquors, often die from a very moderate bleeding of 14 or 15 ounces; in this disease; in these, any plan of treatment is generally unsuccessful; the pulse in them is generally contracted.

The free purging must be assisted by injections of salt and water; Some caution and attention to the degree of action is necessary to be observed in the application of cold to the head: Dr. Hosack states, that he has seen it injurious, from the increased flow of blood to the seat of the disease, which follows its use; the diminution of perspiration which it produces and which is so essentially necessary for the removal of inflammatory action, also, he thinks an objection to it. Tepid applications of warm water, or vinegar and water to the head frequently renewed, he says, he has seen very beneficial in this disease; To reconcile these differences we think that in the highest form of phrenitis, the cold water applied to the head is advisable: When the reaction is more moderate, the warm vinegar and water promises more. In common bilious fever, we have seen cold water of the greatest use.

Pringle mentions that phrenitis is often brought on in the army hospitals from a want of perspiration, and of warmth in the extremities; he, therefore, as soon as a soldier was brought into the house, with feverish symptoms, ordered his hands and feet to be wet with vinegar and water, or a fomentation to the feet and legs of warm water and a seventh part of vinegar, and repeated often for an hour or two at a time: it often cures head-ache in domestic practice:

Some recommend the whole body to be immersed in the warm bath, whilst the head is kept cold by ice:

Cullen thinks little of these measures: there can be no doubt that they are useful, if the feet are cold; and if they are not, a continuance of the fomentations, or bath, postponed till the action is reduced sufficiently by bleeding, will then have a good effect, when a short application was of no use;

A mustard bran bath, mustard poultices, blisters, horse radish and poultices of onions to the feet or legs, may all be used to excite the skin of the extremities; they must, however, only be applied after the action is sufficiently reduced not to endanger an increase of excitement from them, but promote a translation of it to the feet. When it proceeds from suppressed discharges they must be restored.

After the general action is abated and the pain and symptoms of local irritation still remain, blisters to the back of the neck will be found useful: The room throughout the disease must be airy, cool, and dark; the diet should be spare, and composed of easily digested articles. Acids form a pleasant drink, and may be indulged in. They are much to be depended on as assistants in this disease. All stimulating substances must be avoided, as opium, hyosciamus, &c., cider, beer, &c.

The necessity of keeping patients perfectly quiet and still is often experienced from the effect of the ringing of bells and other noises in cities: Pringle and Rush speak of the many deaths produced by bringing the sick from one place to another in waggons, and mention that it often produced death in the army, in removing them to the hospitals. C.

CHRONIC PHRENITIS.

Chronic inflammation of the brain and its membranes is a state of disease by no means uncommon. It seems to occur, in some cases, as a consequence of falls and blows on the head; but in most instances, its origin is altogether inscrutable. It generally terminates in abscess. The symptoms which it occasions are singularly diversified, and the skill of the experienced practitioner is often baffled in attempts to determine its existence. Death is usually preceded by a short period of coma. Could the nature of the disease be ascertained during life, a seton in the neck and regular purging would afford the only legitimate hope of relief.

I have already (pages 69 and 92) spoken of the tendency of

common fever, both in this country, and still more in warm climates, to implicate the brain, and give rise to all the symptoms of phrenitic inflammation. Whether these depend on *true* inflammation, or are attributable to a mere state of *congestion* in the vessels and sinuses of the head, is a matter of no great practical importance; but the occurrence of such symptoms demands the serious attention, and their management the utmost skill of the practitioner.

DELIRIUM TREMENS.

There is a very singular affection of the brain and nervous system, called Delirium Tremens, which deserves notice in this place, from the risk which exists of confounding it with true phrenitis.

SYMPTOMS.

It has for its pathognomonic symptoms, delirium (sometimes fierce, but more generally restrainable), delusions of sight, trembling of the hands or whole frame, and complete sleeplessness. Fever is here seldom strongly developed, and the pulse wants the character of true inflammation. A like combination of symptoms, with the addition of damp perspirations, sometimes occurs in the latter stages of fever, and I have witnessed it as a sequel or metastasis of acute rheumatism. Under all circumstances, delirium tremens indicates extreme danger. It arises in a very large proportion of cases from the excessive use of ardent spirits; but a few instances have been traced to other sources, such as the poison of lead, the habitual use of opium, and strong mental emotion. It appears to have for its proximate cause a peculiarly excited state of the nervous system; but the occurrence of such symptoms in cases of extreme inanition would lead to the belief that *exhaustion of nervous power* expresses perhaps more accurately its intimate nature. Delirium tremens usually runs its course in about four or five days. It sometimes terminates in a fatal epileptic fit.

TREATMENT.

It is universally admitted that this complaint does not admit of depletion by blood-letting. Much mischief indeed has followed its employment. Leeches, however, are occasionally useful, and sometimes in its early stage indispensable. The principal aim of the physician should be to calm and support the nervous system, and if possible to procure sleep. Opium answers all these indications, and must be given in full and frequently repeated doses. Where the complaint can be traced distinctly to the excessive use of ardent spirits, the accustomed stimulus must not be too rapidly

withdrawn. Wine or brandy, in moderate quantities, should be administered. Æther, ammonia, camphor, and hyoscyamus, have also been found beneficial. It is unnecessary to add, that moderate purging should also be directed, for in so disordered a state of the nervous system, the secretions can scarcely fail to be greatly vitiated.

HYDROCEPHALUS.

Children are very subject to an affection of the brain, commonly known by the name of hydrocephalus. Different opinions have been entertained of the nature of this complaint. By Dr. Cullen it was called apoplexia hydrocephalica. Some have viewed it as more nearly allied to the class of dropsies; but modern pathologists incline to the belief that it is a subacute inflammation of the membranes of the brain, and therefore, in strict nosological language, *the phrenitis hydrocephalica* or *infantilis.*

The appellation apoplexia applies with as much force to hydrocephalus as the name phrenitis. The former follows congestion which is also chronic, and the latter succeeds to slow inflammation without congestion: hence they both seem to be nosologically correct. Apoplexia hydrocephalica and serous apoplexy are (we think) different names for the same disease. When the serous fluid is found in the ventricles, it will be found that chronic symptoms have existed for some time, although some additional strong exciting cause may have immediately induced the more permanent symptoms. We have seen blood and the serous secretion in the same brain, and sometimes we find them mixed in the same mass. We call this state chronic apoplexy, if we choose to add another name.

Many more adults are subject to both varieties of this disease, than is generally believed. The author attributes the disease to the infantile remittent fever, but we see it as often the consequence of chronic inflammatory catarrh, more especially in such cases as have run into that state for want of blood-letting and other antiphlogistic means. This variety is not uncommon in adults.

P.

The disease, though very common, was not described with any degree of accuracy until about ninety years ago, by Mr. Paisley, in vol. iii, Ed. Med. Essays. In 1768 it was made the subject of an essay by Dr. Whytt. In 1808 a very complete description of the disease appeared from the pen of Dr. Cheyne. Dr. Monro has recently described it with great accuracy in the first volume of his Morbid Anatomy of the Brain.

Hydrocephalus prevails chiefly among children from the third to the sixth year of life. It has been noticed, indeed, as early as the second year, and as late as the fourteenth. After that period it is seldom met with. From the circumstance of its occurring for the most part in children, the symptoms of the disease do not always admit of being very accurately ascertained. This contributes, with some other circumstances which shall hereafter be noticed, to render the diagnosis more difficult in this disease than in any other to which the human body is subject.

It attacks particular families, and appears therefore to depend often upon constitutional causes. It however also originatesf rom irritants without the system: from falls, from blows upon the head, sometimes from tumors within the skull, or in fine any cause which produces inflammation of the brain, whether from a continued irritation communicated to the disease in a distant organ, as of the stomach or bowels irritated by worms, &c. or by general fever: The action producing the disease may be of a highly phlogistic character, or it may be moderately so, or chronic, but in general it is to be regarded as a disease of increased action. By many writers however, it has been considered as owing to debility of the absorbents alone, and it is not improbable that this may sometimes be the case, as in cases where dropsical effusions take place over the whole body attended with weakness. C.

ITS SEVERAL STAGES.

Hydrocephalus may, for the purposes of instruction, be considered as exhibiting four stages or sets of symptoms; but the distinction must be viewed as a very arbitrary one; and it should be thoroughly understood, that, in many cases, the symptoms of different stages will be found blended together, or one or more of them altogether wanting.

1. The symptoms which characterize the first, or premonitory stage of hydrocephalus, are those of common *infantile fever*, such as often accompany the state of dentition, or a foul stomach, or a disordered state of the bowels, more especially when complicated with the presence of worms. The pulse is quick, the skin hot, the sleep disturbed, the tongue white; there is some degree of nausea and vomiting, with thirst, restlessness, and loss of appetite. The child droops. The fauces being very dry, he picks the nose so as often to make it bleed. The body wastes, and the skin is flabby. The symptoms have irregular exacerbations and remissions; so that this state of disease is generally known by the name of *infantile remittent fever.* An exacerbation usually takes place towards evening.

2. The second set of hydrocephalic symptoms are those which more unequivocally direct attention to the head as the seat of disease. They are, head-ache, sometimes diffused, sometimes referred to a particular spot; impatience of light and noise; a flushed countenance; præternatural redness of the conjunctiva; contracted pupil; tossing of the arms to the head, and occasional screaming or shrieking without any obvious cause. With these are joined the common symptoms of infantile fever, and they denote what pathologists consider the state of acute inflammatory action of the vessels of the brain.

3. The train of symptoms which characterize the third stage of the disease are of a different kind. The pulse, before quick, becomes slow, intermitting, or irregular. The pupils are permanently dilated, and cease to contract on the approach of light. There is strabismus, or squinting. Instead of being restless, and tossing about his arms, the child falls into a state of stupor, and

is insensible to things and persons around him. The screaming fits occur more frequently, and there is an almost constant moaning. The child will often vomit on being brought into the erect posture. Any sudden exertion brings on a fit of convulsion, in which the child dies. These symptoms are supposed to mark that water is now poured out by the vessels of the brain, particularly by those of the arachnoid membrane and choroid plexus.

4. If the child survives this stage, it is occasionally found that after a time the pulse again rises, so as to beat 150 or more in a minute, and is withal small and feeble. The child lies perfectly insensible, and takes no nourishment from actual inability to swallow. The stools and urine pass involuntarily. The face is pale; the tongue dry and brown. Subsultus tendinum, convulsions, or partial paralysis (as of the levator palpebræ) occur; occasionally one side becomes perfectly paralytic. Severe pustular ophthalmia is sometimes witnessed. The immediate approach of death is often preceded by gangrenous spots, or ecchymoses, appearing particularly about the neck, hips, or tips of the ears. This combination of symptoms I have several times seen to occur where the child, during the previous stage, had been kept in a state of perfect quietude.

VARIETIES OF ITS SYMPTOMS.

I have already alluded to the great variety which exists in the symptoms of hydrocephalus, and above all, in the order in which they appear; but of some of these it will be proper to take more particular notice. The first stage is sometimes wanting, the attack being *sudden*, and perhaps the first evidence of the disease a strong convulsion fit. In many instances the pulse never becomes slow. In a still larger proportion of cases the disease never exhibits that remarkable change from the slow to the *rapid* pulse, which characterizes the fourth stage. Occasionally there is neither permanent contraction nor dilatation of the pupil, but throughout the *whole* course of the disease an irregularity in the contractions of the iris may be noticed. The pupil dilates on the approach of the candle, and contracts as it recedes. In a few cases I have seen children continue sensible to the last moment. Other, and even more singular varieties in the symptoms of hydrocephalus will be found recorded in the writings of authors.* It is certainly worthy of remark, considering the universality of *delirium* as a symptom of phrenitis in the adult, that aberration of intellect can scarcely be said to occur in this, or indeed in any of the diseases of early life.

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* See Monro on Hydrocephalus, page 96.

Inflammation of the brain, in its slow or chronic form, has many varieties; there are, however, certain characteristic symptoms, which evince the state of the local determination, never to be lost sight of; as heat of the head, giddiness, weight and fulness, headach, throbbing, stupor, delirium, which appears first, when the fever is high, or on awaking from sleep; difficult or indistinct articulation, loss of memory, the use of one word for another, or of one letter for another in writing, remarkable quickness or slowness, and hesitation in speech or stammerings, mistakes with regard to the day of the week, or the time of the day, evincing confusion of thought, incoherence, sleepiness, dozing, muttering, insensibility, ending at last in coma, or followed by a deceitful improvement; the pulse rising again in a few hours or days to 200, after having been slow for some time; it is likewise often unequal and variable; the pulse falling from being rapid to the natural standard: the vomiting and other symptoms, becoming more frequent: a gaping, or shut eye, transient blindness, double vision, a long sighted person suddenly recovering distinct vision, objects seen that do not exist; unusual contraction or dilatation of the pupil, squinting, distortion of the eyes, paralysis of the eyelids; in the ears, tinnitus, transient deafness, noise in the ear, unusual acuteness in hearing:

These symptoms should awaken the attention of the practitioner,* when any of them occur:

With regard to the termination of those cases which end in effusion there are two varieties. Abercrombie considers, that when the symptoms are at first slight, but which, at an advanced stage of the disease, pass into coma, there is found generally serous effusion, but without disease of the brain; but when the symptoms are acute, violent and inflammatory, there is found effusion combined with the destruction of the central parts of the brain: The acute cases are, therefore, most probably, violent inflammation of the brain; and the serous effusion, only a result of that process: Facts show that this is the case in dropsy of other parts, as of the chest, &c.†

In the cases of suppuration, the same author enumerates four varieties: 1. An extensive portion of the brain, broken down in a mixture of brain and pus. 2. A distinct abscess: 3. Matter on the surface or between the membranes: 4. Superficial ulceration of the brain: The first, the sphacelismus of the books, has less coma than the others; in the second, convulsion and palsy are more common; convulsions taking place, whilst the inflammation is going on, and the palsy appearing when the suppuration occurs. The third, the formation of matter on the brain or between its membranes, or in both situations, is characterised by pain corresponding to the part affected with convulsions, ending in death, with or without coma.

DISEASE OF THE EAR WITH INFLAMED BRAIN.

Sometimes this form begins insidiously with a pain in the ear, with a discharge of matter; the patient becomes delirious, oppressed, drowsy, and comatose; Sometimes there is no discharge from the ear; he becomes restless, forgetful, rolling his head about, and at last sinks into coma; Caries of the pars petrosa, and the dura mater above it, thickened, spungy, and ulcerated, are discovered after death: also a small abscess in the brain, with effusion into the ventricles:

Sometimes the disease begins in the deep seated parts of the ear and spreads into the pars petrosa, which speedily becomes carious: An abscess also forms behind the ear, communicating with the mastoid cells, which is frequently followed by inflammation of the brain:‡ I have seen a case of deep ulcer in the meatus auditorius, which discharged a thick pasty pus, and which was often fol-

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* Abercrombie, Edinburgh Med. and Surg. Jour. vol. xiv. p. 266. et seq.

† Ed. Med. and Surgical Journal, vol. xiv. p. 292. et seq.

‡ Ibid. p. 294. et seq.

lowed by great pain in the head, delirium, &c., indicating inflammation of the brain, and which was cured by active depletion, bleeding, &c. during the fits; at last, the whole disease was subdued and the ulcer cured by restricting the patient to a diet of watery vegetables, as water cresses, salad, turnips, &c., keeping the bowels open, and abstaining from all exciting substances or occasions, as crowded rooms, intense light, &c. Sir Astley Cooper describes four cases, in which a small abscess formed on the pars petrosa, in consequence of the same affection: Abercrombie states, that relief sometimes takes place in these cases, by the matter getting vent, by being discharged externally by the ulceration of the bone; Sometimes the passage for the matter closes up, and the case becomes fatal; at others, the running continues and perfect recovery takes place; Coma, paralysis, or convulsions, generally are the final symptoms, when it is fatal.

Sometimes suppuration of the ear and deafness occur, without fever, and the patient dies from the effect of death of the bone, which has been found black, carious and crumbly, with a discharge of fœtid pus, the dura mater being at the same time sloughy and separated from the bone.* Another case is related, in which death took place, after great increase of pain in the ear, accompanied by great debility, exhaustion, giddiness and some vomiting; No stupor or any other remarkable symptoms occurred, till the fatal day, when convulsions and coma preceded: An abscess was found in the middle lobe of the right hemisphere of the brain, and another in the cerebellum, with caries of the pars petrosa and effusion in the ventricles:† Sometimes abscess in the brain follows suppuration in the ear, without any connection existing between the internal disease; the external disease only shewing the tendency to chronic inflammation: In these cases the abscess of the brain is found at some distance, as on the other side from the diseased ear: There exists no caries of the bone in this case: Sometimes, even the spinal chord is affected.‡

DISEASE OF THE NOSE, BONES OF THE HEAD, &C. WITH INFLAMED BRAIN.

Suppuration, ulceration and caries of the bones of the head may take place in different parts, as in the nose, temporal bones, or other parts of the surface of the head; the inflammation may communicate to the brain, and death, preceded by coma, &c., as above, may take place: Blows on the surface of the head, often produce inflammation of a small point of the cranium, followed by all these consequences: The disease may either cease in the external part, the chronic inflammation being translated to the brain, or it may continue and affect the brain immediately, near the seat of inflammation: Sometimes the trephine has removed with success a portion of the bone which was found to be carious, perforated with little holes, through which matter penetrated to the surface of the brain: Though this affection of the bone most frequently arises from blows upon the head, yet it appears without any apparent cause; Sometimes the pericranium is healthy though the bone below is diseased, with pus on the surface of the dura mater: The inflammation in these cases begins on the surface of that membrane;§ it sometimes begins in the pericranium, which has been contused: it remains painful on pressure for a long time, without advancing or mitigating in the least.

Sir Everard Home states the symptoms of this inflammation to be headache with various uneasy feelings in the head, a painful tenderness in the scalp,

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* Transact. of the Coll. of Phys. of Lond. vol. v., quoted by Abercrombie, vol. xiv. of Ed. Med. and Surgical Journal.

† Abercrombie, quoting Parkinson, vol. xiv. Ed. Med. and Surgical Journal, p. 304.

‡ Ibid. § Ibid.

at a particular spot, with some swelling or thickening of the skin at that place; Sometimes impaired sight and hearing, and epileptic fits: Tissot describes an intense pain on a very small spot of the bone; Ponteau mentions the same circumscribed pain connected with intense head-aches, fits, mania, tetanus, paralysis; the fits were produced by pressure on the red spot: Sometimes the hair upon the part becomes coarse, like bristles; Sometimes the pain is periodical, with epilepsy:

An incision down to the bone discovers that the pericranium is inflamed, and cures it completely, without doing any thing further; Sometimes there is intense pain in the part, which no alteratives will relieve; then an incision down to the bone effects the cure.*

Sometimes after a blow on the head a portion of the bone is absorbed, the skin remaining sound: tumors on the surface of the cranium, also, sometimes produce an absorption of the bone:†

Effusion of pus on the internal and external surface of the cranium is the result of inflammation of the pericranium, in an acute and chronic form.‡ C.

HYDROCEPHALUS.

The duration of hydrocephalus is liable to almost as much variation as the symptoms which characterize it. It has been known to prove fatal in a week. Some cases run on even as far as two months, but these are comparatively rare. The average duration of the complaint may be stated to be three weeks.

PROGNOSIS.

The general opinion of the world has sufficiently stamped the *prognosis*. Dr. Whytt did not save more than one out of twenty cases. Many practitioners of great experience have seen only two or three instances of favourable termination, when the symptoms were so strongly marked as to preclude all possibility of being deceived as to the nature of the complaint. The duration and degree of the disease will determine its danger; in the first stage, the patient is sometimes cured; in the second, very rarely; in the third, almost never. It must be confessed that the *diagnosis* is difficult; yet I am equally satisfied that many cases of genuine hydrocephalus have been recovered by judicious treatment, which (on that very account perhaps) were considered to be only disordered states of the primæ viæ. I have witnessed one case of recovery after the occurrence of complete hemiplegia.

Stupor, coma, apoplexy, dyspnœa, a weak intermitting pulse, involuntary evacuations, squinting, deafness, great pain in sitting up, are unfavourable symptoms, after which recovery rarely takes place. The duration and degree of the disease will determine its danger; in the first stage, the patient is sometimes cured; in the second, very rarely; in the third, almost never. C.

To determine what the diseases are, with which hydrocephalus is liable to be confounded, is an object of some importance.

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* Sandfort's Thesaur. † Abercrombie, quoted as above. ‡ Ibid.

DIAGNOSIS.

1. The first is common or typhous fever. The only manner of guarding against this source of fallacy is by bearing steadily in mind, that idiopathic fever is not common in young subjects, and that hydrocephalus is. Unless the evidence therefore be very unequivocal (as where the disease can be *distinctly* traced to contagion,) the symptoms should always be attributed to hydrocephalus, and not to typhus.

2. The second source of difficulty in the diagnosis, arises from the *early* symptoms of hydrocephalus being in every respect the same with those which accompany abdominal irritation; but chiefly from the important pathological principle, that several abdominal diseases, particularly those of children, are liable in their progress to affect the brain and nervous system, and to produce symptoms resembling those of the *latter* stages of hydrocephalus. The exact nature of these abdominal affections has been a frequent subject of dispute. By some it is supposed that derangements in the *hepatic* system have a strong tendency to produce hydrocephalic symptoms; but I do not believe that the liver is more, if even so much concerned in this as the stomach and intestinal tract. A mere functional disturbance of these organs gives rise to remitting fever, head-ache, and vomiting. The presence of worms creates a degree of irritation that in the most striking manner counterfeits hydrocephalus. But of all the states of abdominal disease which are liable to be mistaken for it, by far the most important is inflammation and ulceration of the mucous coat of the small intestines, particularly the ileum. In its latter stages, I have seen this disease attended in children with coma, dilated pupil, and screaming, constituting a secondary affection of the brain and nervous system.

The symptomatic variety often occurs after a disorder of the bowels which has been protracted for weeks; the appetite is impaired; the bowels are costive; the stools are clayey; lastly, depression, listlessness, and unhealthy colour of the skin are some of the symptoms of gastric derangement, which personate this disease; calomel succeeds generally in removing the irregularity of bowels, by free purging.* Besides these symptoms the liver and stomach often give symptoms of pain, when pressed upon, and the liver has exhibited inflammation, tubercles, and adhesions to the peritoneum on examination after death; also inflammation of the bowels† occurs. This form may also supervene upon inflammation of the lungs, or of any injury of the abdomen.‡ When symptomatic, the disease creeps on in an insidious manner; languor, unhealthy expression and colour of the face; dark coloured line under and dulness of the eye, are among its signs; capricious appetite; the bowels torpid or irregular;

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* Medical Recorder, p. 393. 1820.
† Abernethy, Surg. Observ. part second.
‡ Med. Chir. Journal.

occasional thirst; the urine white, or with sediment; stools clayey, yesty, fœtid, or dark green and gelatinous, with an oily surface, of a sickly smell, also characterize it. When these symptoms occur, if the bowels are not operated on, the stools continue unchanged till death.* The head becomes sore, with but little pain; the sleep disturbed; and the mind often more active than usual; the brain gradually becomes affected, and the symptoms of the first acute stage, as above described, appear. C.

3. With reference to the diagnosis of hydrocephalus, it must further be observed, that in children the latter stages of what appears to be *pneumonia* are sometimes attended with coma and screaming,—the early symptoms, that is to say, having been difficult breathing, a hard pulse, and cough. These cases are extremely deceiving. On dissection, the thoracic viscera often appear healthy, while the ventricles of the brain are perhaps loaded with serum. The circumstance is well deserving of notice, as, without some explanation, the practitioner might be exposed to the opprobrium of having misunderstood the case.

The diagnosis of this disease is difficult: Dr. Coindet states that it is characterized by a peculiar moan or cry; and that the urine deposits a white chalky or micaceous sediment; Dr. Whytt has remarked that the urine is furfuraceous till within a few days of death, and also that it deposits a white chalky sediment; Dr. Cheyne thinks, that it is generally easy to distinguish hydrocephalus from fever, the ordinary course of the symptoms being generally sufficient; "The gradual commencement; the more irregular remission; the dyspeptic symptoms; the nature of the excretions; in particular, the glairy, dark, and unnatural stools; the aversion to light, and the whole expression of the disease differing much from that of fever; the nature of the pains, attending hydrocephalus, which are also acute throughout the body, as also in the head; the pain when fixed is oftener dull than acute, but so overpowering, that it does not admit of the head being raised from the pillow: It is sometimes, however, a very acute pain, but is not increased by every throb of the artery, like the phlegmonic pain; generally it is deep seated, like the pain attending some of the visceral inflammations, but it differs in this, that it is not increased or rendered more frequent by any muscular exertions."† As to the diagnostic symptoms, given by other authors, it is useless to state them, since they may all proceed from other causes; the disease is best known by observing narrowly its progress, as above detailed. The drowsiness; the fever with vomiting; costiveness; morbid sensibility to light; inclination to lie down; moving the hands to the head; the pulse from being frequent and regular becoming slow and irregular, with violent pain in the head; screaming and costive state; pupil of the eye dilated; squinting, &c.* are the most certain signs. C.

DISSECTION.

Dissections in hydrocephalus exhibit the ventricles more or less distended with fluid. The quantity varies much, and can never be anticipated from the violence of the preceding symptoms. From one to six or eight ounces are generally found. The effused fluid does not coagulate on the application of heat, like the serum of the blood, or many other dropsical fluids. It

* Cheyne, p. 64.

† Cheyne quoted by Cooke, vol. i. p. 428, et seq. Lond. 1820.

has never happened to me to see any flakes of lymph floating in it. Where the disease occurs at an early period of life, the quantity of effusion has sometimes been such as to cause a tumour on the anterior fontanelle. In a case recorded by Dr. Baillie, the ossa parietalia were separated to a considerable extent, after being to all appearance firmly closed.* Tumours, probably of a scrofulous kind, have been also met with, of different sizes, situate either in the substance of the brain or cerebellum, or attached to the membranes. It has often occurred, that where hydrocephalic symptoms have been the most strongly marked, no morbid appearances have been discovered in the brain on dissection. In these cases it is generally supposed, that the disease has proved fatal during the first stage; but in a certain proportion of them, organic disease sufficient to account for death might possibly be found in some other part of the body, were the dissection fully prosecuted.

Induration or softening of the substance of the brain, distention of the veins; the veins gorged with dark blood; adhesions and thickening of the membranes of the brain; the substance of the brain soft and white; the fornix resembling a soft curd; the liver and other viscera of the abdomen inflamed, also appear on dissection.

The French anatomists describe the brain as if covered with a coat of varnish; in other cases with an exudation of pus: Laennec has seen tuberculous granulations in the substance of the brain.

In the abdomen, we discover as the result of sympathy with the brain, more particularly in the stomach, inflammation, suppuration, engorgement, and softening of its substance: the intestines are also found to be gangrenous, softened, inflamed, and invaginated.

PATHOLOGY.

We have stated, that hydrocephalus is one of the forms of phrenitic inflammation; but it must be admitted that such a view of the disease is not perfectly satisfactory. This may be gathered from the very rare appearance of flakes of lymph, or of suppuration in the brain, as consequences of hydrocephalus; and from the great mortality which attends the disease, in spite of the vigorous measures of depletion which are so constantly practised, and which would not fail to relieve inflammatory affections in other parts. In what circumstances hydrocephalus differs from common phrenitis has never been accurately explained. It is commonly stated, that the first stage of hydrocephalus is one purely of increased excitement of vessels, and that serum is not effused until the pupils are dilated, or strabismus, or the slow pulse come on. This piece of pathology has always appeared to me to be doubtful. I am inclined to think, that the vessels of the brain throw out an undue proportion of water even from the

* Medical Transactions of the College of Physicians, vol. iv. p. 1.

very first, and that the symptoms of *compression* which mark the advanced stages of the disease are owing to the *accumulation* of water in the ventricles, rather than to incipient effusion.

The only predisposing cause of hydrocephalus that is known, is the scrofulous diathesis. Its occurrence in scrofulous families, its alternation with other forms of scrofulous disease, its connection with scrofulous deposits in the brain, and other textures of the body, form the strong grounds on which this opinion is supported. Its most common exciting causes are, teething; cold; suppressions of tinea capitis, or of scrofulous runnings behind the ears; injuries to the head; and previous diseases, especially measles, scarlatina, and hooping cough. We are authorized in laying it down as a general rule, that in all the febrile disorders of children, there is a *tendency* to that form of phrenitic inflammation which terminates in serous effusion. In the treatment of infantile diseases this principle must be steadily kept in view, as it is *practically* of much more consequence than any attempt to discriminate them from hydrocephalus by fine and arbitrary distinctions.*

It is unquestionable, that the disease has arisen in many cases without the slightest assignable cause.

TREATMENT.

The object of treatment in hydrocephalus is to diminish that general inflammatory excitement, and that flow of blood to the head, which exist during its early stages; and afterwards to promote, if possible, the absorption of the effused fluid. In what we have called the first or premonitory stage, reliance is to be placed on purgative medicines, particularly rhubarb and calomel, or the powder of scammony and calomel in doses sufficient to ensure a full action on the bowels: R. Hydrargyr. submur. gr. ii. Pulv. Scammon. gr. iv. Sacchar. purificat. gr. ii. M. f. pulv.

Dr. Cheyne advises cathartics to be freely given, after leeches, or cups to the side, when indicated by the state of the hypochondria, the nature of the stools, of the tongue, and the sickly breath: Calomel, rhubarb, jalap, scammony then answer: When the breath is sickly, mild antimonials are to be added to the cathartics; and if the urine is deficient, squills may also be given. As opening the bowels is at first difficult, the purges should be given in the largest doses.

The use of purges of calomel and jalap, frequently repeated, of jalap and cream of tartar in large doses, have a beneficial effect: The late Dr. Lawrance of Philadelphia gave to young children doses of these medicines, which were

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* It is stated by Dr. Rush to have been produced by the common intermitting fevers and by rheumatism; by Dr. Percival, to have proceeded from consumption; by Dr. Odier to have followed small-pox, and according to Lieutaud and others, the colic, palsy, melancholy, insolation, dentition, scrofula and the healing of old sores. C.

sufficient for grown persons, and from the characteristic torpidity of the bowels with little effect. The degree to which the dose can be increased is truly surprising. C.

When the symptoms of phrenitic inflammation, or as some would rather say, of cerebral excitement, develop themselves, the jugular vein must be opened, or a vein in the arm, and from four to six ounces of blood taken away. I have opened the temporal artery under these circumstances with the best effect. Of the indispensable necessity of blood-letting in hydrocephalus, I can hardly express myself too strongly.* Much of the danger commonly imputed to this disease may be referred to the neglect of this necessary evacuation.† If bleeding in the jugular vein, or arm, should unfortunately be found impracticable, or considered decidedly inadvisable, leeches or cupping may be substituted, and their operation assisted by purging with calomel and jalap, or this strong aperient mixture: R. Infus. senn. compos. ℥v. Potass. tartrat. ℥i. Tinctur. jalap. Tinctur. senn. āā ℥ ss. Syrup. rhamni. ʒiii. m. take a fourth part for a dose and repeat it every quarter of an hour till the bowels are freely opened; and by the application of cold to the head. In a few instances I have had recourse to the cold affusion.‡ The child may further be directed to take every three hours a saline draught, with antimonial wine and the tincture of digitalis, as in the following formula: R. Potass. nitrat. gr. v. Aq. menth. pulv. ʒiv. Vin. tartrit. antim. gtt. v. Tinct. digital. gtt. v. Syrup. ʒ i. m. ft. haust. tert. quaq. hor. sumend.

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* Some excellent observations on blood-letting, as applicable to the diseases of infantile life, may be found in Dr. Clarke's Commentaries on the Diseases of Children, chap. vi, pages 148–160.

† It should be prompt, decided and in sufficient quantities. In consequence of failure in 25 cases of hydrocephalus by the usual modes, Dr. Maxwell of Dumfries, Scotland, adopted the practice of bleeding from the jugular vein till fainting was produced, the patient being laid in a recumbent posture: Of ninety cases treated in this way Dr. Maxwell states sixty have recovered: The bleeding was continued till syncope had taken place; and after taking a little wine and water when the pulse revived, some more was abstracted, till it could no longer be felt; the patient then generally remained without signs of life for 10 minutes, when he revived gradually and in the evening the symptoms became more favourable: The mind and strength were remarkably improved; he rested tolerably through the night, on the next day the bleeding was repeated from the left jugular vein and the child completely recovered.

During the whole inflammatory stage the patient should be kept in an erect posture; in a cool and airy situation, tranquil and free from all disturbance. C.

‡ Iced water, æther and water, (the patient being placed in a draught of air so that the vapour will not be inhaled,) applied frequently and renewed whenever they become dry, may be used with advantage; a stream of cold water poured upon the head has had a most decided effect upon the symptoms.

In acute hydrocephalus Dr. Jadelot of Paris considers the disease at first as gastro-intestinal, which he treats by emollient applications over the abdomen, with topical bleedings from the liver, stomach, &c., and as soon as the cerebral or second stage has commenced, the treatment is directed to this part, without, however, losing sight of the abdominal irritation: Ice is put upon the head, and after free local bleeding, from its surface, the patient is put at the same time into the warm bath; blisters to the head, with mercurial ointment applied to its surface, calomel in large doses by the mouth, form the remaining items of this treatment. C.

When the symptoms lead to the notion that water is effused, bleeding is for the most part ineffectual, and even sometimes absolutely prejudicial. It ought not however to be forgotten, that the symptoms of effusion are equivocal, and that an inflammatory condition of the cerebral vessels does not always subside, even when effusion has actually taken place. Blisters should now be applied, either to the crown of the head, or to the arm, or better perhaps to the back of the neck.* At an earlier period of the disease, they appear rather to increase irritation. At all times considerable caution is requisite in applying blisters to children. Their skins are generally very delicate and irritable, and in feverish states of the body (when the skin is *hot* and *dry*) they occasionally produce very high local inflammation, ending in sloughing or gangrene, or such a degree of nervous irritation, as terminates the life of the child by a convulsive fit.† Occasional purgatives and the exhibition of digitalis may be continued, with a view of directing the fluids upon the bowels of the kidney. Under the idea of stimulating the absorbents, mercury is nearly always resorted to. Calomel, in large and frequent doses, is recommended by some even from the very first, but the propriety of this practice is very questionable. Mercurial inunction is preferred by others; and towards the latter stages of the disease, this method of treatment has certainly proved effectual in some cases. The medicine frequently shows its influence upon the system, by affecting the bowels. Salivation is not easily excited in children, but it sometimes occurs, and has even occasioned considerable inconvenience.

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* They may also be applied over the whole head, in the form of a cap, and they should be kept running by the application of a fresh blister, or the ointment of cantharides, or the savin cerate: or an escar may be formed by wetting a small portion of the blistered surface with a strong solution of lunar caustic, just before it is going to heal up: When the inflammatory state is nearly subsided but still exists, the blisters should be applied to the neck, in order that the iced water may be used to the head at the same time: a blister after the inflammation has been subdued often relieves the part greatly. C.

† Carmichael Smyth recommends instead of blisters the application of powdered lunar caustic put on the surface of adhesive plaster spread on leather and of the shape of an elongated half crown; it must be renewed every twelve hours until a sufficient escar is produced; simple cerate as soon as the escar separates may then be applied, and the issue kept open by savin ointment. C.

It has been held by some distinguished physicians, that the effused fluid is never absorbed, and consequently that none recover from this state. We cannot subscribe to this opinion. We think, that if the secretion can be arrested by the antiphlogistic means, the absorbents may, and do remove the secreted fluid. We have seen several recoveries, after all the strongest marks of hydrocephalus had been clearly manifested. If we cannot demonstrate lymphatics in the brain, we are bound to admit their existence, because we know that considerable portions of the brain itself have been removed in disease without any other possible exit, except the agency of the lymphatics.

Mercury is usually too sparingly used, more especially as it regards doses of calomel; as friction does not succeed so well in an emaciated condition of the body. The application of water (to the head) at that temperature which will most effectually conduct heat, is amongst the most effectual agents we can employ in this disease; provided blood-letting and mercury shall have been employed to a proper extent, more especially the former. The digitalis is useless and sometimes hurtful. It excites too highly in its primary operation, and at last only diminishes sensibility at the expense of morbid excitement. P.

Salivation succeeded in the practice of Dr. Dobson, and Dr. Percival: The relief was decided as soon as the mercury produced its effects. The mercury is applied in the form of ointment to the surface of the head, and at the same time extensively rubbed over the body. Calomel given internally with fresh squills is highly recommended by Carmichael Smyth: The same medicine administered with the antimonial powder is also extremely beneficial in this disease. Dr. Rush, however, states that he succeeded with it but in two cases. Dr. Crampton praises highly digitalis, calomel and opium, in the last stage. Dr. William Hunter (Med. Comment. 1782) relates a case in which the symptoms of effusion had taken place, and were completely relieved by the vapour bath. When the patient is convalescent, he should be supported by jellies, light broths, as chicken water, by arrow-root, sago, tapioca, &c. use moderate exercise in the open air, and as the strength is established, wine, porter and other nourishing and stimulating drinks should be given, in moderate quantities with proper tonics.

Dr. Coindet advocates the use of tartar emetic, as having a specific agency in the premonitory and early stages of this disease: A large quantity of the medicine is necessary to produce its usual effect; He recommends it, even as a prophylactic: Dr. Cheyne also praises James' powder in this disease, as having peculiar virtues.

CHRONIC FORM.

It remains for me to notice the chronic form of hydrocephalus, or that which is accompanied by enlargement of the skull.* Sometimes this disease is congenital, but more usually it begins during the first month. In consequence of the bones of the cranium giving way, the usual symptoms of compression do not come on. The size which the head attains in this disease is often enormous.† On dissection, the brain appears flattened out, but it will be found to weigh about as much as a healthy brain would

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* This complaint has been frequently, but very improperly termed *hydrocephalus externus.*

† I made the following measurements of the head of a child eleven months old, who died of chronic hydrocephalus under my care, December 28, 1818.—Greatest circumference of the head twenty-three inches,—smaller circumference twenty-two and a quarter inches; distance of the parietal bones from each other, seven inches. Four pints of fluid were contained within the brain.

have done at the same age. In the progress of the disease, the functions of the body generally are very little, often not at all impaired till a short time before death. It is almost incredible how little the powers of the mind are affected by this disorder. Dr. Monro states, that in no instance seen by him could it be said that the intellect was deranged. In one remarkable case, of twenty-six years duration, in which the head measured forty-four inches in circumference, the patient displayed a very affectionate disposition towards his parents, entered into the amusements of his brothers and sisters, and enjoyed a tolerably retentive memory. Attempts have been made to afford relief to this apparently hopeless state of disease by tapping, and a case, successful for a time, is recorded in the Medico-Chirurgical Transactions (vol. ix. page 354.) More recent observations have shown, that the risk from this operation is great, and that it is not generally to be recommended. Bandaging of the head has been tried, but without material benefit. The complaint does not necessarily prove fatal at an early age, a few cases being on record of its continuance to an advanced period of life.

CHAPTER VIII.

OPHTHALMIA.

Structures primarily affected—Inflammation of the Conjunctiva—The Purulent Ophthalmia—Consequences of Purulent Ophthalmia—Interstitial Ulcer of the Cornea—Acute—Chronic—Gangrene of the Cornea—Sclerotitis—Choroiditis—Iritis—Inflammation of the Retina—Ectropium—Entropium—Procidentia Iridis—Onyx and Unguis—Elongations and Excrescences—Frena—Coadhering Tarsi—Scrofulous Ophthalmia—Nebula and Pustule of the Cornea—Rheumatic Ophthalmia—Of Syphilitic Iritis—Treatment of Common Ophthalmia—Treatment of the Purulent Variety—Of the Œdematous—Of the Atonic—Of the Irritable—Of the Scrofulous—Of the Variolous—Of the Venereal—Of the Rheumatic—Of the Intermittent—Treatment of the Acute Interstitial Ulcer of the Cornea—Of the Chronic Variety—Treatment of Sclerotitis—Of Choroiditis—Of Iritis—Of Frena—Of Nebula—Collyria—Inflammation of the Lachrymal Gland.

The attention of medical authors has been strongly directed to the subject of ophthalmia during the last twenty-years, chiefly in consequence of the general introduction into the army of the purulent or Egyptian ophthalmia. This happened in the year 1800; previous to which time, neither the seat of the disease, nor the precise character of its consequences, had been described with any degree of accuracy. The circumstances that render the study of this disease so difficult, are the varieties of structure which we meet with in the complicated organ of vision, where membranes, cartilages, humours, ducts, glands, and hairs, are all intimately connected together. It will not be necessary however here, to enter with any degree of minuteness into the consideration of ophthalmia, because it has latterly been almost wholly taken out of the hands of the physician. Still the outlines at least of the pathology of ophthalmia should be understood by every student of physic; and further, a brief notice of them will be necessary to complete our view of the inflammatory affections of the body.

STRUCTURES PRIMARILY AFFECTED.

Inflammation may begin in almost every one of the structures of which the eye is composed; but the principal primary seats of ophthalmia are, the tunica conjunctiva, the sclerotica, the iris, and the meibomian glands. The phenomena of the disease are remarkably modified by diversities of exciting cause, more so perhaps in this than in any other instance which could be brought forward. This principle therefore it will be necessary to bear in mind, in the short sketch which will be offered of the symptoms and progress of the disease.

INFLAMMATION OF THE CONJUNCTIVA.

The structure most frequently affected is the conjunctiva, in function resembling a mucous membrane, though in appearance more nearly allied to those of the serous class. The inflammation of this membrane is characterized in mild cases, and where the disease arises from common causes, by pain, intolerance of light, a sensation of sand in the eye, head-ache, redness of the eye, and an *increased flow of tears.* The general febrile symptoms are slight, or perhaps altogether wanting. The disease gradually goes off without leaving any permanent bad effects.

THE PURULENT FORM.

In the severer forms of ophthalmia, the invasion is often sudden, the progress of the disease rapid, and its result disorganization of all or some of the structures necessary to vision. Besides the symptoms already enumerated, there occur in this form of ophthalmia, swelling of the eyelids, and secretion of purulent matter by the inflamed membrane, often in enormous quantity, and from a very early period of the disease. The conjunctiva quickly loses all traces of transparency, and exhibits instead, a mass of spongy red granulations, in which the transparent cornea may sometimes be observed as at the bottom of a well. This inflammatory thickening of the membrane, from the increase of its vessels, is called *chemosis.* The other symptoms are in a proportionate degree of violence. The head-ache is excruciating. The smallest ray of light gives intense pain. The febrile symptoms which accompany this state of disease run high, and are for the most part aggravated towards evening.

This is the disease known by the name of the purulent or Egyptian ophthalmia.* Its further progress depends in a great

* There seems to be no good reason to conclude, that the form of ophthalmia which has lately received this exotic appellation differs in any respect from ordinary cases. It is well known, that the internal surface of the eye-lids takes on the purulent secretion from many causes, that slight degrees of inflammation will not produce it, and hence it is probable, that the propensity of this membrane to secrete pus is owing to its organization, rather than to any particular cause. P.

degree upon the measures of treatment which may be adopted in its early stage. If these are judicious, the symptoms begin to yield about the third day, and in the course of some weeks the eye is restored to its natural state. But if the disease be unusually violent, or its early stages neglected, disorganization of the eye follows to a greater or less extent.

CONSEQUENCES OF PURULENT OPHTHALMIA.

Sometimes the inflammation spreads to such a degree, that every part of the ball of the eye becomes involved in one uniform mass of suppuration, and the eye is totally lost. This however is rare. The disorganization is generally confined to one or other of its different structures. The inflammation, for instance, spreads from the conjunctiva covering the sclerotic coat, to that more delicate part of the membrane which extends over the cornea, and the consequence is either opacity or thickening of the cornea, occasioning total or partial blindness;*—or open ulceration of the cornea, a state of disease attended with a remarkable degree of

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* OPACITY OF THE CORNEA.

Mr. Travers describes opacity of the cornea as of three kinds:

"1. Thickening of the conjunctiva and effusion of adhesive matter between it and the cornea, or between the lamellæ of the latter. This is commonly the product of acute strumous ophthalmia. The corneal surface loses its smoothness and polish as well as its transparency, when the conjunctiva is affected; when the opacity is in the cornea this is not the case. This is that form of opacity which, while recent, admits of removal by excitement of the absorbents more or less completely, and especially by that which mercury produces, the corneal texture being sound. It is what I have been accustomed to call nebula, and though presenting great varieties of shade, it has a soft, diffused, semi-transparent character.

2. A slow change of texture without breach, similar to that by which the pleura, or choroid, or capsule of the lens is converted into bone. The yellow pearly opacity, resembling the inside of an oyster-shell, is of this kind. It is the result of continued, or frequently relapsing (strumous) rather than violent inflammation, and is deep seated. In this case the layers of the cornea become opaque, indurated, and condensed, so as not to admit of separation by the knife or maceration; and if such opacities are in any degree relieved, it is by an absorption of the interlamellar deposit in their vicinity.

3. New matter, supplying an absolute loss of substance of the cornea, from ulceration or gangrene. This differs from the second chiefly in its figure being more abruptly circumscribed, and bearing more resemblance to a cicatrix. In point of density the second often exceeds it, as when the cicatrix does not penetrate the cornea. Both these species of opacity are white in the recent state, and in general the more conspicuously their color is contrasted with this appearance, as yellow or brown, the less is the probability of reducing them." *

* Travers, p. 117–19.

pain;—or lastly, *interstitial* ulceration of the cornea.* This last affection is, correctly speaking, ulceration of the proper membrane of the cornea, the delicate layer of conjunctiva which covers it remaining entire. This kind of ulcerated cornea occurs often in debilitated states of the system, and is accompanied by a deficiency, or total absence, of that action in the vessels which is necessary to repair the loss of substance. It is therefore often relieved by bark, and other tonic medicines, and by stimulant applications to the eye itself.

GANGRENE OF THE CORNEA.

Mr. Travers describes gangrene as taking place in suppurative inflammation of the cornea, preceded by a deposition of adhesive matter, between its layers: He states that the transparency of the cornea is susceptible of restoration, though upon the verge of gangrene: He mentions a case, in which gangrene of this description was cured; the inflammation ran high and the patient was extensively depleted; immediately after the stimulating plan was adopted, the gangrene was stopped, and by touching the mouth, absorption of the deposited lymph took place; the figure of the cornea and also the sight were perfectly restored. The appearance of the cornea in this state is designated as exhibiting a loss of tension and lustre, described by Mr. Saunders as cindery, ragged and flocculent; the first change produced by the inflammation is to render the cornea nebulous by the deposition of adhesive matter. He states that the opacity produced by lime or other substances destroying its texture is sometimes superficial and defined in extent, attended with a process resembling exfoliation; Sometimes the disorganization is total; acids render the cornea instantly opaque, and of a yellow color resembling wash leather:

Those, in which the nebula is diffused and semitransparent, admit of absorption; but where the interstitial deposit has been abundant and of long standing, and the lamellæ are compacted, owing to the destruction of the cellular texture, or in cases where a new cornea is formed, the opacity can never be removed.† Stimuli applied to the cornea to be effectual must be properly apportioned to the state of the part; if they excite too much action they increase the deposition instead of lessening it.

"Opaque specks, even cicatrices, are obliterated during the period of growth, and, as is observed of cicatrices in other parts of the body, change their relative position remarkably in the years of growth. Thus a conspicuous speck, encroaching upon the pupil in the infant, becomes a small and scarce discernible speck in the grown child, situated near the verge of the cornea. In other

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* INTERSTITIAL ULCER OF THE CORNEA.

This ulcer is of two kinds: the acute and chronic; The acute interstitial ulcer is described by Travers as being frequently of the figure of a crescent, and passing over the greater part of the cornea; its extent is determined by a deposit of adhesive matter on the surface; The movements of the upper eye-lid are excessively painful, in consequence of the part of the conjunctiva immediately opposite to the ulcer, being absorbed.

The chronic interstitial ulcer is the species described in the text, as appearing in debilitated subjects: it often follows long-continued inflammation of the eye; appearing as a dent on the cornea, which retains its transparency.*

* Travers, p. 114–17. † Ibid. p. 119–20.

instances, if originally small, it has disappeared altogether. Like cicatrices of other parts, they are always considerably smaller than the ulcers of which they are the vestiges." *

SCLEROTITIS.

Inflammation of the sclerotica is always present when depositions of lymph are formed between the layers of the cornea, or when these layers are ulcerated; the straight vessels which run over the muscles of the eye form a vascular zone round the cornea; they can be seen on its surface and are always turgid: Sometimes sclerotitis exists as a primary inflammation; Travers describes it as more obstinate than acute; as being very painful, when the ball is moved; its continuance renders the cornea nebulous and the surface roughened from effusion beneath the conjunctiva.†

"The inflammation of the sclerotic sometimes accompanies, and is sometimes vicarious with rheumatic inflammation. This is not surprising, as its texture is of the same class with the ligaments of the joints. The rheumatic ophthalmia presents the zonular arrangement of the vessels, more or less cloudiness of the aqueous humor, and a pupil displaced or drawn a little to one side. It is often seen in company with, or following gonorrhœa, eruptions, or sore throat of a pseudo-syphilitic character; and the pains to which, in my experience, it is generally allied, are those which succeed to the exhibition of mercury." ‡

The sclerotica is sometimes absorbed near its junction with the cornea, so as to shew the choroid coat below it; this occurs most commonly in amaurosis, induced by inflammation. Sometimes near the cornea, it has a sacculated or pouched appearance.§

CHOROIDITIS.

The appearance of the vascular zone round the cornea, taken by itself, is, according to Travers, a sign of the inflammation having extended to the sclerotic coat; but he mentions that if it be accompanied by dullness of the humors, a spastic contraction, or a very sluggish and limited motion of the pupil, an impatience of light and a considerable dimness of vision, the choroid and the iris participate in the inflammation.‖

Pustular ophthalmia, as this is called, sometimes spreads to the deep-seated membranes. The iris in particular is frequently so affected, and the consequences are various. Lymph or pus may be effused into the anterior chamber of the eye. If pus is effused to any extent, the cornea is pushed forward, presenting the appearance called hypopion, or poached eye; or it may be ruptured and the iris protruded, constituting that painful and nearly incurable condition called *staphyloma.* Another effect of the inflammation spreading inwards is, that the iris contracts adhesions, particularly with the capsule of the crystalline lens, and with the posterior layer of the cornea, whereby the motions of that membrane are lost, and blindness, to a greater or less degree, produced.

IRITIS.

"The indications mentioned under choroiditis, are still further confirmed by the presence of an habitual aching pain affecting the globe of the eye, forehead, and region of the orbit: and by certain appearances of inflammation

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* Travers, p. 122. † Ibid. p. 128–29. ‡ Ibid. § Ibid. ‖ Ibid. 131.

upon the iris, as hair-like red vessels and specks of extravasated blood in its substance. Adhesive inflammation takes place between the fibres of this muscle; the pupil loses its thin flowing edge, and becomes thick, stunted, and gibbous. Iritis of moderate acuteness is often unaccompanied by any other appearance of inflammation; there is no distinct deposit of lymph, and it is rather inferred from the fixedness or slight change of figure of the pupil, than demonstrated. The adhesive matter, in this case, is deposited on the posterior surface, formerly called uvea, for in the course of a few days, the opacity of the capsule of the crystalline, and the co-adhesion with it of the pupillary margin, becomes evident, provided the inflammation be unchecked. In this form of inflammation the pain is often augmented in the evening, or at an early hour of the morning, to such intensity as to compel the patient to rise, and even totally to deprive him of rest. Sometimes the pain affects the whole corresponding side of the head. In other instances it is confined to the eye-ball and its immediate vicinity, as the forehead and temple, and bones of the cheek. The sensation is sometimes that of pulsatile pain, marking every injection of the ophthalmic artery, as of the radial artery in a whitloe. A sense of continued pressure or constriction, as from extreme distention of the vessels, is the more common character of the patient's sufferings. In the vehement acute iritis, lymph is variously deposited upon the face of the membrane, in small tufts here and there, or large tubercular masses. The pupil, in this case, is usually much misshapen, being rendered angular at those points of the circle at which the deposit has taken place, or is most abundant. Its aperture is sometimes partially covered, and sometimes completely blocked by a mass of lymph. The pain, in this state, is not always augmented in proportion. It affects more the head than the organ. The vision is nearly if not quite extinguished. The appearance of a stratum of lymph, coating the face of the iris, with a turbid state of the aqueous humor, belongs to chronic inflammation, which tends to opacity of the capsule of the lens, and constriction of the pupil.

Primary.—A primary inflammation of the iris, as for example, from syphilis, or from mercury, is distinguished from the secondary, or that by extension from the conjunctiva, by the more sparing vascularity of the conjunctiva, and consequently more distinct and conspicuous appearance of the vascular zone. The attack is more sudden, the pain in the region of the orbit and head, commences with the inflammation, and is more severe; the vision is more quickly and completely bedimmed. The effusion of lymph is *en masse*, and the disfiguration of the pupil greater.

Secondary.—In the inflammation of the iris by continuity, the conjunctival vascularity is more conspicuous and diffused, and the cornea is so much clouded, as partially to obscure the view of the iris; the albuminous deposit is wanting, or if any has taken place, it is small in quantity, white, flocculent, and partially diffused in the aqueous humor, or is deposited at the ciliary margin of the iris, forming a lymphatic hypopion; the pupil is little, if at all, misshapen. The pain in the secondary iritis is usually confined to the ball, and is comparatively inconsiderable. Although the vision is much bedimmed, there is greater susceptibility to the painful impression of light.

The terminations of iritis, if unsubdued, are, 1st, constricted or closed pupil, with opaque capsule; 2d, co-adhesion of the iris and cornea, partial or entire, the former assuming the convexity of the latter; 3d, organic amaurosis, followed by disfiguration of the globe, and often by protrusions of the choroid and sclerotic.

Iritis is very frequently in company with, or succeeding to syphilis, and the symptoms called mercurial, as peculiar eruptions, sore throat, and pains of a rheumatic character. Primary iritis is rarely seen unaccompanied or unpreceded by such symptoms. Where the primary affection was either altogether questionable, or at most a gonorrhœa, or a superficial sore, which healed by a simple topical application—the iritis has yielded to the steadily supported influence of mercury upon the system, in a manner the most satisfactory.

The iris undergoes a change of color as well as texture, by a continuance of

inflammation. This is owing to the loss of its transparency, and the interruption given to its proper secretion by the lymph deposited upon its posterior surface. The healthy iris is transparent, as may be seen in the albino, white rabbit, and ferret; hence the use of the pigmentum nigrum.

It suffers a loss of mobility from the agglutination of its fibres, and ultimately of its posterior surface to the tunica hyaloidea, by which the posterior chamber is annihilated. It is from this morbid condition extending to the plicæ ciliares, that the loss of figure of the globe, or the staphyloma of the sclerotic and choroid, results. A notable thickening and rigidity, a leather-like toughness of the iris, and a varicose state of its vessels, are changes accompanying the state of chronic closed pupil, after reiterated attacks of inflammation.

A morbid change sometimes, but rarely witnessed, is the conversion of the choroid into a shell of osseous matter." *

INFLAMMATION OF THE RETINA.

The inflammation of the retina is known by the following symptoms:

"A sudden attack of vehement dashing pain of the most distracting kind, which is described to extend from the bottom of the eye-ball to the occiput, or in the reverse direction, and the supervention, within a few hours, of total blindness, with occasional sparks and flashes of vivid light. The pupil, upon inspection, is gaping and motionless, as in confirmed amaurosis, and the humors are thick and muddy: The external signs of inflammation are in the commencement disproportionate, and quite insufficient to account for the symptoms.

In some cases, however, the signs of choroid inflammation are present with the attack of pain and the loss of sight. The pupil is not thrown open, but it is without motion. In addition to diffused vascularity of the conjunctiva, the straight ciliary vessels are remarkably loaded, so as to give a livid red hue to the sclerotic around the cornea. The pupil becomes in a few days plugged with lymph, or the whole iris bulges forward, changes color, and the crystalline turns opaque; or instead of this, the same splendid tapetum-like appearance presents itself, which is observed in the commencement of the medullary fungus, upon looking oliquely through the pupil. The pain in this attack is accompanied with a sense of confusion so alarming, that the patient apprehends the loss of his intellects." †

Vigilance, temporary wanderings, catches of the muscles of the face, startings, and frightful dreams, in the short intervals of repose from exhaustion, are also mentioned as symptoms; with heat, tenderness, and constriction of the whole scalp, inducing the supposition that inflammation of the brain and its membranes was the original disease: Meteoric flashes of light often attend the chronic form of this malady and inspire a deceitful hope in the patient. The most active plans of treatment do but little good in this malady; Sometimes vision has been preserved so far as to enable the patient to discern the forms of surrounding objects; it destroys the sight sometimes in a fortnight. This inflammation produces amaurosis by a deposition of lymph, or otherwise disorganizing the retina. ‡

PROCIDENTIA IRIDIS.

When the iris is protruded through an ulcer in the cornea, it is called procidentia iridis; and when the opening is small, as when it is the result of simple ulceration, the iris looks like a small black point; if larger, as from sloughing, it protrudes in the form of a sac; adhesion takes place between the margin of the aperture in the cornea; in case of ulceration, the adhesive process does not take place so soon as in case of a wound; the prolapsus also increases till a stimu-

* Travers, p. 132–37. † Ibid. 138–39. ‡ Ibid. p. 139.

lant is employed: the process of healing is marked by a dusky line at the verge of the opening.*

ONYX AND UNGUIS.

The terms onyx and unguis have been applied to collections of lymph and pus between the layers of the cornea and also to similar collections in the anterior chamber: When the acute interstitial ulcer instead of opening upon either of its surfaces spreads between the lamellæ of that membrane, a considerable quantity of matter being secreted, then it is properly named onyx and unguis; if it occupy a large and central portion of the cornea, it ends in sloughing of the entire membrane.†

Occasionally it happens that the *eye-lids* continue to suffer, either with, or without permanent disorganization of the eye itself. The internal surface of the eye-lids, for instance, remains red and granular; and this in its turn renews the inflammation of the conjunctiva covering the ball of the eye, and leads perhaps to opacity of the cornea. At other times the cartilaginous edges of the eye-lids are the parts affected, and the eye-lids are either everted, forming the disease called *ectropion*, or the tarsi are turned inwards upon the ball of the eye, constituting the *entropion*. Both these states of disease of the palpebræ are tedious, and often difficult to manage. They require surgical operation. The only other consequence of acute ophthalmia which it is necessary to allude to here, is that state of *chronic* inflammation of the conjunctiva which is frequently left, especially in weak and scrofulous habits.

The manner in which eversion of the eye-lids is produced does not appear to be clearly stated by the author; the formation of granulations on the surface of the eye-ball in the form of fungous excrescences, pendulous flaps or hard callous rolls, protrude between the palpebræ and the globe and evert the former (ectropium); or if they do not protude, they press against the lower and inner part of the eye-lid and thus turn the edge of it against the globe, producing the state called entropium. These conical fungous excrescences are not granulations, which are never formed without breach of texture.

ELONGATIONS AND EXCRESCENCES.

"Preternatural elongations and excrescences of the conjunctiva, concealed in the hollows of the palpebræ, are a sequel of the protracted mild suppurative ophthalmia, where the palpebral conjunctiva has been the principal seat of disease: They are similar to those of the membrane lining the rectum, and the fine skin at the verge of the anus after inflamed piles, and the pudendum muliebre in acute gonorrhœa. All such membranous growths are, I believe, referrible to irritation of inflamed parts by the diseased and confined secretion, as the warts in external gonorrhœa." ‡

FRENA.

"The frena or frenula connecting the conjunctiva palbebrarum and conjunctiva scleroticæ, a troublesome, and often irremediable deformity, follow burns and

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* Travers, p. 116. † Ibid. p. 115. ‡ Ibid. p. 99.

wounds of the conjunctiva tarsi, and the excision of tumors connected with this portion of the membrane. They are membranous bands formed by adhesive inflammation of the opposed and contiguous surface (pleura costalis and pulmonalis—peritoneum of the intestines and parietes). It is not necessary that both surfaces should be wounded, if the position be by a mistake of treatment preserved, as by the application of a bandage. "The opposite uninflamed surface," as Mr. Hunter observes, "accepts of the union." I have seen these frena produced by a slit eye-lid from a fall, and trifling as the inconvenience might seem, it so restricted the motions of the globe, and the disease was so materially aggravated by operations to relieve it, i. e. by the multiplication of frenula, that the patient became disturbed in his intellects, from an exaggerated sense of his misfortune.

The co-adhesion or concretion of the tarsi by organized adhesion of the conjunctiva tarsorum, is rare. I saw a remarkable case of it in a full grown boy, whose eye was found perfect after the division, though he had been thus blind from his infancy. It is similar to the co-adhesion of the nymphæ or labia pudendi, and the closed anus in new born infants.

The conjunctiva is not prone to ulcerate, whilst the substance of the cornea readily assumes that action; hence the frequency of ulcers not opening externally, and of ulcers penetrating into the anterior chamber. Its readiness to assume the adhesive inflammation is evinced by the rapid formation of a superficial speck where it has been scratched or abraded, and the assistance it affords in healing open ulcers of the cornea. There is a marked disposition in these cicatrices to ulcerate in subsequent attacks of inflammation, which are in the same degree as in other parts slower to heal than the original texture. The synovial membrane is as much less disposed to ulceration than the cartilage, as the conjunctiva is than the cornea, or the periosteum than the bone, or the peritoneum than the mucous coat of the bowel. All these external close membranes accord in their disposition to adhesive inflammation.

The conjunctiva, viewing its compound pathological character, bears in its respective relations to the sclerotic and the cornea, an affinity to the two distinct classes of membranes, viz: the mucous upon the sclerotic, and the serous upon the cornea; hence the frequency of pustule and the tendency to suppurative inflammation of the sclerotic portion, and the indisposition to ulcerate and proneness to adhesive inflammation of the corneal."*

Before proceeding to notice the other varieties of ophthalmia, it may be proper to inquire into the causes of that common form of it, whose principal symptoms and consequences have been now detailed.

CAUSES.

Mechanical and chemical irritations, such as acrid fumes, a drop of spirit getting into the eye, an eye-lash turned inwards, walking against a very strong wind, or too long exercise of the eye, are frequent causes of ophthalmia. In no part of the world is it a more common disease than in Egypt, and several causes have been assigned for its prevalence in that country. The fact appears to be, that a great many circumstances, each of them sufficient to produce ophthalmia, are there combined; such as great heat succeeded by heavy dews; bright light; a burning wind from the

* Travers, p. 103–4–5.

desert, and innumerable particles of fine sand everywhere floating through the air.

But besides these causes of ophthalmia, which may be supposed to operate upon the eye *directly*, there are many, which act through the medium of the general system. Cold may be mentioned as one of the most frequent. Bile and sordes in the stomach and bowels have also occasioned ophthalmia. The purulent ophthalmia of infants has been attributed by some to this source. Intemperance leads to a chronic state of inflammation of the eye. The presence of fever in the body, or the operation of the exanthematous poisons, have brought on ophthalmia, as we judge from its so frequently accompanying small-pox, measles, catarrh, and hydrocephalus. In many cases ophthalmia must be regarded merely as the evidence of an inflammatory or very highly excited state of the vessels of the brain. It frequently accompanies the secondary fever of small-pox. As it often happens that inflammation of one eye is succeeded by a corresponding affection of the other, sympathy of the eyes has been justly regarded as an exciting cause of the disease. *Habit* may be looked upon in the same light. It is well ascertained, that a soldier who has once suffered from a severe attack of ophthalmia, is liable to have it renewed by very slight causes, such as a night-guard or a debauch. No doubt can be entertained, that among the exciting causes of ophthalmia, *contagion* deserves to be noticed. This has been disputed, but not by those whose opportunities of observing the disease have been upon a extensive scale. The experience of the army fully warrants this principle of pathology.

One of the most remarkable of all the exciting causes of ophthalmia still remains to be mentioned:—the repulsion of gonorrhœa, or metastasis from the urethra to the eye. The occurrence is rare, but it is sufficiently ascertained. Some have attempted to explain the phenomenon by supposing that there is a direct application of the gonorrhœal matter to the eye; but this is altogether an unsatisfactory hypothesis. Ophthalmia from repelled gonorrhœa is always a violent disease, resembling in every respect the worst forms of Egyptian ophthalmia. While the eye continues inflamed, the discharge from the urethra generally ceases. The circumstances which tend to produce this metastasis, or translation of the disease, have never been explained, though they are probably within our reach.

Such are the most important of the causes of common inflammation of the eye; and we have next to notice those which do not merely operate as exciting causes, but which have a further effect in giving a peculiar *character* to the disease. Of these the most important are scrofula and syphilis.

SCROFULOUS OPHTHALMIA.

When ophthalmia occurs in a scrofulous habit of body, the parts most usually attacked are the conjunctiva, the tarsi, and the meibomian glands.* The disease is very common in young children from the time they are weaned, and is often the first indication of the presence of the scrofulous diathesis. Scrofulous ophthalmia occurs both in the acute and chronic form.† The appearance of the eye in either is very characteristic. The disease is attended with a high degree of impatience of light, and a profuse secretion of tears, greatly exceeding what might have been expected from the corresponding severity of other symptoms.‡ It is accompanied by a copious secretion from the

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* For a very clear and practical detail of the symptoms and treatment of scrofulous ophthalmia, see Jeffrey's "*Cases in Surgery*," London 1820.

† "They are, with very few exceptions, constitutional diseases; and the same remark applies to many instances of the mild acute suppurative ophthalmia. This is proved by the disorder prevailing in the system of nutrition, by the general debility of the habit, and by the concurrence of local affections in other parts referrible to the same source. The habit, age, and sex of the patient frequently contribute to the predisposition. The sphere and mode of life have also a decided influence in the production of these diseases. Children are most frequently affected by them, and those especially, subject from infancy to glandular enlargements, chilblains, cutaneous eruptions and chaps, psoriasis, tinea, and porrigo. Imperfect nutriment, whether from the nature or deficient quantity of their food or defect in their powers of assimilation and absorption, contributes to them. To this may be added an impure atmosphere and want of cleanliness. The tendency to such diseases is demonstrated before they exist, and to prevent their recurrence is often more difficult than to remove them. It is common for a parent to say, "I know what will remove the complaint, but I cannot prevent its return." This however arises from neglecting to follow up the cure to its completion, and properly to employ the interval of the attacks.

A gentleman determined to relinquish animal food, and lived wholly upon vegetables and water. From the enjoyment of good ordinary health, he was in the course of six months reduced to a lamentable state of disease. The whole mucous surface became affected successively, after a severe and obstinate attack of mild acute suppurative ophthalmia. His system was so alarmingly debilitated by the protraction of his disease, owing to the prostration of his restorative powers rather than to the violence of the morbid action, that a residence in the south of Europe became necessary for the final re-establishment of his health. The disposition of such a class of diseases to fasten on the organ when once seated, in other words, to become chronic, is as characteristic as their tendency to re-appear when for the time removed. They come slowly, and so depart. Violent means fail to cure them. They are, to the surprise of persons who mistake their character, unaffected by such measures; which, if persisted in, produce a change for the worse. If the remedies employed increase the debility of the system at large, it must follow that the part suffers, if this account of their constitutional origin be correct. Hence it is not uncommon for those who treat all inflammations alike, to express their surprise at the obstinacy of these affections, after going through and through again the routine of an active antiphlogistic treatment."—*Travers*, p. 262–4.

‡ Mr. Travers attributes this increase of sensibility to sympathy of the retina with the inflamed surface; it is always accompanied by an unnatural state of the tongue, and by a dry and harsh state of the skin: This state also occurs in the eye, the nose, and ear, which are attended with morbid sensibility.

glands of the tarsi of a thick matter, which during sleep agglutinates the eye-lids. Besides those consequences which it has in common with some other species of ophthalmia, the scrofulous inflammation of the eye is often followed by ulceration of the cartilaginous edges of the palpebræ, which under bad management may continue to harass the patient for a number of years. It must be remembered, however, that this chronic inflammation of the tarsi (the *ophthalmia tarsi* of Dr. Cullen), though very frequently, yet is not always dependant upon the scrofulous disposition.

NEBULA AND PUSTULE OF THE CORNEA.

"The nebula and the pustule of the corneal conjunctiva are the terminations of this inflammation when it affects the texture of the organ, to which may be added the small herpetic ulcers, reddish brown points, giving to the cornea a scabrous appearance. The healing action is always remarkably languid and protracted, as if the state of excessive irritability checked its progress, and prevented its completion.

The conjunctiva of the sclerotic is disposed to form aphthæ or pustules at the verge of the cornea, or near to it. In the former situation, where the more lax adhesion becomes abruptly strict, the pustule is elevated or cone-like, and is the termination of a distinct pencil of vessels; which arrangement sometimes precedes and announces the disposition to pustule. When it is situated at a distance of a line or two from the corneal margin, it is broad and flattened. It is a small speck or patch of lymph, and seldom advances to suppuration. It is common to see one on either side of the cornea, in the transverse axis of the globe. Sometimes they appear in detached clusters, or a zone of pustules environs the cornea. This resembles the aphtha of the mouth and fauces and intestinal canal.

The pustules of the corneal conjunctiva, which are less frequent, except in children, are generally situated near to the margin of the cornea, where one or more pustules of the sclerotic portion appear. Like the aphtha of the glans penis and the stricter parts of fine cutaneous texture, the pustule on the cornea usually forms an ulcer."

RHEUMATIC OPHTHALMIA.

In *rheumatic ophthalmia*, the white of the eye acquires a brick-red tinge, or an admixture of yellow with crimson red; the blood-vessels are numerous and passing in straight lines over the whole white; advancing close to the cornea, but neither passing over it nor leaving the pale circle around it, which is so striking when the choroid coat or iris is inflamed in venereal ophthalmia: The cornea becomes dull and torpid as the disease advances, with a general cloudiness, more opake in the centre than in the circumference; the eye is at first dry and then accompanied by a secretion of tears; there are some abrasions of the cornea and conjunctiva, which require close examination to detect them: The head is the chief seat of the pain, which sometimes affects the eye-ball, extends to the temple, teeth, or lower jaw, appears in hemicrania, or occurs in fits. It sometimes destroys the cornea by ulceration; or there is a puriform secretion into the eye itself. It is distinguished from syphilitic inflammation by the history of the preceding symptoms. C.

OF SYPHILITIC IRITIS.

The venereal poison is occasionally the cause of inflammation of the conjunctiva, but for the most part, venereal ophthalmia

* Travers.

assumes the form of inflammation of the iris. In this disease there is increased sensibility of the eye, with pain in the eye-ball, without the usual redness of the conjunctiva.* The fine hair-like vessels of the iris may be observed injected with red blood, or small specks of blood may be seen extravasated upon that membrane. In a more advanced stage of the disease, the fibres of the iris are occasionally agglutinated. The edge that looks inwards appears thickened and immovable. A layer of lymph, or a globule of pus, may be seen upon it; or it is found adhering to the cornea or capsule of the lens. The latter stages of *iritis* are attended with severe pain, aggravated towards night.

Such are the appearances of venereal ophthalmia. The power of calomel over this state of disease is admitted to be very great; and it must therefore be considered a very singular circumstance in the history of iritis, that it has sometimes been *brought on* by calomel. This idea at least is entertained by some, but by others the correctness of the opinion has been called in question.

TREATMENT OF COMMON OPHTHALMIA.

The treatment of ophthalmia involves too many surgical details to be entered upon with any minuteness here. During its early stages, and before any disorganization of structure has taken place, its treatment must be conducted on the general principles which have been already explained. In the purulent and pustular forms of ophthalmia, the depleting system must be early resorted to, and vigorously pursued. Bleeding at the arm (in some cases opening the temporal artery), local blood-letting, especially by cupping-glasses applied to the temples, active purging, blistering, and nauseant doses of emetic tartar, are to form the groundwork of the treatment.† Warm narcotic fomenta-

* "The first symptoms of venereal ophthalmia in its most common form when the iris is not particularly affected, are insidious, slow, and attended with little uneasiness; a gradual relaxation of the vessels of the conjunctiva take place, and of the internal membrane of the palpebræ, with a perverted secretion of the ciliary glands; ulceration of the eye-lids, and paleness of the cornea: Itching takes place in the eyes, increasing towards evening and again abating in the morning."

† "With large blood-lettings, repeated, subject to the discretion of the practitioner, until the inflammation yields, a brisk catharsis should be combined, and this followed by a tea-spoonful of a solution of emetic tartar every hour, so as to keep up a state of nausea, perspiration and faintness. The discharge at first ropy, viscid, and sparing in quantity, becomes thin, gleety, and more abundant; as the swollen lid subsides, the conjunctiva sinks and becomes pale and flabby; and if at this period, the pain and febrile irritation being past, the cornea retains its tone and brightness, all is well; the disease has given way, and a careful but prompt exhibition of tonics, with the use of cooling astringent lotions, will prevent its lapsing into a chronic form. But if, when the lowering practice has been pushed to the extent of arresting acute inflammation, the patient being at the same time sunk and exhausted, the cornea

tions to the eye, assiduously applied, are of considerable use. In milder cases, leeches, purgatives, and cold lotions will be sufficient.

The necessity of active depletion is mainly to be determined by the effects of the inflammation upon the cornea; Where the sclerotica is much raised and the cornea has lost its polish, and more particularly when lymph is effused upon its surface, the disease must be considered as requiring the most prompt and decided measures.*

The leeches should be applied to the under palpebra, as they have been used with effect to the inner part of the eye-lid. The tumefied vessels of the adnata should be deeply scarified with a lancet; or a leech be applied directly to them, with the greatest effect. The bleeding both general and local should be repeated every day or twice a day, till the inflammation is subdued. The purgatives used should be saline and gentle; as Epsom salts, Glauber's salts, soda phosphorata, tamarinds, cream of tartar, frequently repeated till the system is reduced: Calomel and jalap, or rhubarb, will answer equally well; or the bowels may be kept freely open by small doses of tartar emetic. The use

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shews a lack-lustre and raggedness of its whole surface, as if shrunk by immersion in an acid, or a grey patch in the centre, or a line encircling or half encircling its base, assuming a similar appearance, the portion so marked out will infallibly be detached by a rapid slough, unless by a successful rally of the patient's powers we can set up the adhesive action so as to preserve in sitû that which may remain transparent.

To know how far to go and not outstep the boundary; to know when to venture upon a short and sudden reverse of treatment, is the great difficulty of this highly important case. It is a fatal mistake to consider the first change, which is a true adhesive nebula, as the sign of gangrene or death, and thus to temporise, or even under this delusion to support the diseased action. Another and scarcely less mischievous error, is to treat the discharge as the disease, which is in fact but an inconsiderable sign of it as regards its importance, and to stimulate by strong astringent injections in its commencement. But the pathology which attributed the destruction of the cornea to the corroding quality of the matter secreted, was so lamentably erroneous, that we cannot be surprised at any effects, however mischievous, which resulted from the treatment thence deduced.

In closing my observations on the treatment of inflammation of this organ, I shall take the liberty of making one or two general remarks. When inflammations in their nature destructive are arrested by the vigor of the means employed, the system stands in great need of the power thus lost for its recovery; to restore parts partially injured, and to supply the place of those which are destroyed. We see this fact exemplified in many instances both of disease and injury. A patient labouring under pneumonia is relieved by excessive bleedings of his attack, and dies a month afterwards of dropsy. A person threatened with apoplexy, who by the advice of his physicians is cupped once a month, soon falls a victim to erysipelas.

If much blood is lost in severe injuries, especially of aged people, the healing powers are prostrate and gangrene ensues."†

Travers continues to observe that he has often heard of from 60 to 70 oz. of blood being lost by venesection, which he believes to arise from a neglect of proportioning the quantity to the absolute necessity of the case; and, secondly, without balancing the effect upon the system at large against the importance of the organ.

* Travers, p. 272—4. † Ibid. p. 260.

of emetics in the Egyptian ophthalmia has been strongly recommended by Sir William Adams, Mr. Saunders, and by Scarpa, in the first stages of the common form of this disease. There can be no question they will be found valuable in all violent cases; particularly where the system is affected with fever;* and after the inflammation has abated, more particularly where it proceeds from suppressed perspiration, 10 grs. of nitre with the sixth of a grain of tartar emetic will be found useful at night by relaxing the skin.

The patient must be kept in a cool dark room, and if the inflammation runs high, the whole head should be covered with cloths wrung out of iced water, or ice laid upon the head and near the eye by means of a bladder, or of towels, the ice being put in between the folds: Blisters applied either to the back of the neck, over the eye and forehead; behind the ears, or to the temples, are valuable: The excitement of a counter-irritation is the principal indication in using them. Astringent and cooling eye-waters should be applied to the eyes; by means of pledgets laid over the lids, or the water should be introduced into it by means of an eye-glass; or injected by a syringe. The following eye-waters will be found to be valuable. R. Zinc. Vitriolat. gr. vi. Sacchar. saturn. gr. x. Laudan. Liquid. ʒi. Aq. Fluvial. ℥v. M.

R. Alum. Sulphat. ℈i.ss. Aq. Fluvial. ℥vi. M. This is said to be particularly useful when the granulations are excised in the purulent ophthalmia; alum, however, we think, is too irritating. It should be used only before the surface is scarified.

R. Sulphat. Zinc. gr. x. Aq. Rosar. ℥iv. M.

Scarpa recommends the following: R. Vitriol. gr. vi. Mucil. cydon. mal. ʒi. Aq. distillat. ℥vi. Spirit. vini. camphor. gutt. pauc. M. et cola.

The injection of simple hot water often is as useful as any thing else: At first the patient will in many cases be more relieved by the application of emollients; as bread and milk poultices; mallows boiled in milk; the soft pulp of a baked apple, included in a fine muslin bag: In some cases the cold applications are beneficial from the first; and as the efficacy of these remedies depends in some measure upon idiosyncracy, a trial is the only means of ascertaining it. When cold collyria do not agree they should be warmed; they then often succeed. The eyes should be smeared at night with simple cerate or spermaceti ointment to prevent the irritation produced by opening them in the morning. After the free use of the above remedies the serous discharge from the eyes abates, becomes thick and purulent, in common cases, or entirely disappears, the eye being dry and without any discharge whatever. There remains however some soreness, on exposure to light, and the disease abates or approaches the chronic form.

If the inflammation should be obstinate a blister or an issue kept constantly open between the shoulders are valuable assistants. Frequently when the inflammation runs high, the puncture of the cornea has a fine effect in abating the inflammation: It was originally proposed by Mr. Wardrop to prevent the bursting of the cornea, which sometimes take place: this change is preceded by a great distention of this membrane, loss of its transparency, and the formation of a white ring round its edge; the puncture is made with a common lancet; as soon as the water escapes the inflammation abates. C.

TREATMENT OF PURULENT OPHTHALMIA.

In the *purulent ophthalmia* of infants, which is believed now as the author states to be the same disease as the Egyptian species, the same active system of depletion must be pursued; and after the general inflammatory symptoms are subdued, the following formula recommended by Mr. Ware is found to be extremely valuable: R. Cupri Vitriolat. Bol. armen. āā gr. viii. Camphoræ gr. ii. misce et affunde aq. bullient. ℥viii. When it is cool, let it be injected be-

* See a case related by Dr. Dobson, Ed. Med. Com. iii. p. 411.

tween the eyelids, very frequently, graduating with great caution the strength of the solution according to the sensibility of the eye: The injection must remove at each time the matter from the surface of the eye, and as the inflammation subsides the frequency of its use may be abated, as also its strength; at first a dram of the collyrium may be put into an oz. of clear cold water, and if the eye bear it well, it may be used in a less diluted state. A gr. of alum to the oz. of water makes a good eye-water in this form. Poultices in general in the purulent ophthalmia of infants are hurtful: If they are used, they should be tonic and astringent, made of the curds of milk, turned by alum and an equal part of unguentum sambuci, or hog's lard, applied cold, with the constant use of the injection at the same time. The nitrate of silver (gr. i. to the oz. of water) is praised as a collyrium in this species. The vinous tincture of opium in this form often is very useful, a few drops being insinuated between the eye-lids and repeated three or four times a day.

Larry, to prevent the Egyptian ophthalmia advised washing the eyes and the whole head with vinegar and warm water; all irritating applications to the eye should be avoided, as strong light, dust; the body should be covered from head to foot in the night; and all marshy and damp places should be shunned, and the perspiration kept up as freely as possible: heating and strong liquors, and indigestible food must not be taken. If the system is debilitated, the habit must be strengthened by the use of tonics, as bark and steel, &c. C.

When the disease has assumed a chronic character, some applications of a stimulant kind, as the diluted citrine ointment, alum lotions, or the vinous solution of opium* are eminently serviceable.

On this subject we think it proper here to interpose a useful caution of Mr. Travers. He mentions:—"One of the great errors, it appears to me, in the treatment of inflammations of the eye, though of late years much corrected, has been the irritation of the inflamed organ by stimulant drops and ointments. The advantage of them is fully admitted at a proper season; but during the presence of active inflammation their use is as revolting to common sense as it is injurious. I am satisfied many eyes have been thus destroyed. An anomalous species of ophthalmia, or a pseudo-ophthalmia is produced by it, which differs as much from the real character of the disease in either of its forms, and may be as readily distinguished from it, as an artificial from a natural flower. Thus, to mention one of many cases, I have seen the star-like arrangement of the vessels around the margin of the cornea, the cornea and remaining portion of the conjunctiva clear, and the choroid and iris perfectly free from inflammation, the sequel of an inflammation of the follicles which had been incessantly stimulated; and I know cases of permanent and excessive congestion, or rather varices of all the veins of the conjunctiva with an actual discoloration of the sclerotica, such as would lead to the belief that the person laboured under confirmed organic amaurosis, in which however the sight is perfect. Here the plan of irritative applications had been unremittingly pursued by several practitioners in succession. The anomaly consists in the existence of such appearances unallied

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* Camphor ointment, (Maternité): Fresh butter ʒiii. Spermaceti ʒii. White wax ℥iii. Dissolve and add Powdered camphor, White oxide of zinc, of each gr. iii. To be applied in chronic inflammation of the eye-lids to the parts affected at night.

Ointment with the oxide of mercury; (Maternité) called the ointment of the Regent: Fresh butter ℥iii. White wax ʒiv. melt them and triturate together; add red oxide of mercury ʒiss.—to be applied as above. C.

with the states of which, by their habitual association, we consider them characteristic. An apprehension suggests itself to my mind, when I see such cases, that the external character may be the prototype of internal disease, or, at least, that the confirmed existence of the one may predispose to the production of the other."*

When the disease has advanced to such a point that any of the structures within the orbit are injured, the case becomes purely surgical.

ŒDEMATOUS OPHTHALMIA.

"The œdematous elevation of the conjunctiva is significant of a feeble action, and is by some regarded as erysipelatous. A more than ordinary fulness of the sclerotic conjunctiva is often combined with the nausea, foul tongue, and præcordial oppression, which manifest disorder of the stomach and liver in cutaneous erysipelas; and the solution of emetic tartar given at short intervals, operates very beneficially in reducing it.

ATONIC OPHTHALMIA.

"There are inflammations which assume a chronic character in their commencement, evidently depending on a state of atony, of very partial extent, void of pain, and scarcely possessing any sign of inflammation, except the congestion of vessels, or if any, so feebly marked as to encourage us to disregard them in treatment. In such cases, a single stimulus will often restore the healthy action at once. The vinous tincture of opium has acquired a nostrum-like importance, from its restorative operation in such cases; a virtue I believe not proper to it. A drop or two of the zinc or the lunar caustic solution, of water impregnated with calomel, or a minute portion of the citrine ointment, or any other stimulant introduced within the palpebræ would do as much. Some old women use their morning's urine with admirable effect in these cases. It is the character of the morbid action, not the application, that explains this sudden recovery. The re-excited or increased momentum of the arterial action clears the stagnant capillaries, and the unloaded vessels recover their tone. Such cases are frequently relapsing, unless means similar to those of cure are continued as prophylactics.

IRRITABLE OPHTHALMIA.

"In certain habits, or states of the system—whether the ophthalmia arises from constitutional disorder or local injury—bleeding, purging, and blistering, the ordinary means of arresting inflammation, are employed without apparent benefit, or at least with a very disproportionate degree of advantage, and if the plan is persevered in, it soon becomes injurious; the irritability by which it is marked, increasing as the strength fails. These are cases in which opium, if we so combine it as to countervail its tendency to check the natural secretions, has an admirable effect, viz. with calomel, antimony, or ipecacuanha."†

TREATMENT OF SCROFULOUS OPHTHALMIA.

Scrofulous and venereal ophthalmia require a treatment adapted to the particular circumstances of the exciting cause. In iritis from the syphilitic virus, mercury, as I have stated, is indispen-

* Travers, p. 275-6. † Travers, p. 260.

sable. In scrofulous ophthalmia an antiphlogistic plan of treatment must be judiciously combined with the administration of such medicines, and the observance of such a regimen, as are found useful in counteracting the scrofulous disposition. A grain of calomel should be given every other night. The following collyrium should be employed during the day, R. aq. ros. ℥x. sulphat. zinc. ℈i. m. f. collyr., and the ung. zinci applied to the edges of the eyelids every night, in severe cases change of air will be found indispensable.

The internal administration of bark with valerian and carbonate of soda, the volatile tinct. of guaiac., animal food of easy digestion, gelatinous and farinaceous broths; the cold bath; the moderate use of wine; a pure and temperate air; sea bathing with frictions on the skin, will be found useful in relieving the scrofulous disposition. Though the radical cure of this diathesis is impossible, yet there are certain things which must be avoided to prevent its growing worse: The abstraction of blood, the frequent use of debilitating saline purgatives, food of difficult digestion, as hard, smoked, salted, or fat meats; raw vegetables; acid fruits; intense study; moist and marshy situations; a sedentary life; and frequent vicissitudes of temperature, are all hurtful.

When the inflammation, however, is of a sthenic character, Travers recommends a more active practice; this is particularly indicated where rapid changes are taking place upon the cornea, as a diffused opacity, or the formation of pustule, and when it is passing into ulcer on that membrane, and more especially when the deeper tunics are partaking of the continuance of the inflammation; though generally, as is above stated, neither active bleeding nor drastic and debilitating purgatives are proper in this disease.*

Rhubarb, the supertartrate of soda, with tartar emetic in small doses, are proper purgatives; lime-water and milk, or lime-water and chicken broth, taken in the quantity of three ozs. of each, morning and evening for some months, and with constant observance of a light and digestible regimen, will do much to relieve the symptoms of this diathesis.

"Mr. Ware has found that the addition of xx. to xxx. gr. of the sal polychrestus of the Edin. Dispensatory, to each dose of bark, suffices to keep the bowels in a regular state, when there is tendency to costiveness. In some cases, in which there was little appearance of inflammation, this gentleman found the eye-lids so relaxed, and the eyes so irritable, that children would not open their eyes, even in the darkest room. In some such relaxed cases, very beneficial effects were produced by administering internally small doses of opium, night and morning, to abate the irritability."†

With regard to the local treatment, emollient and relaxing applications must be avoided; the eye should be exposed to a moderate light, and be covered with a piece of green silk.

The collyria should be slightly astringent or anodyne, as those of lead-water and white vitriol, formerly enumerated; a weak decoction of henbane, and the flowers of mallows boiled in milk, to which a weak solution of sugar of lead is added; also ointments composed of tutty, and armenial bole; as the following:

R. Tutiæ preparat. ʒi. Unguent. Cetac. ℥i. m.

R. Tutiæ preparat. et Bol. Armenic. āā ʒii. Precipitat. alb. ʒi. Axung. Porcin. ℥ss. m.

This last is the celebrated ointment of Janin; the lard must be well washed with rose water, and the ingredients, reduced to a fine powder, must be thoroughly mixed with it. It is to be applied by insinuating a small portion about

* Travers on the Eye, p. 264. Lond. 1824.

† Cooper, vol. i. p. 182. 1810.

the size of a pea or barley corn, on the point of a probe between the eye-lids morning and evening; It should be reduced by lard, if it is too strong.

The vapour from two drams of the volatile aromatic spirit, and two ounces of boiling water put into a vessel holding three ounces, which is to be so surrounded with a hot cloth that the vapour will gain access to the eye, will be useful: applied in this manner two or three times a day, the eye-lids being rubbed with the aromatic spirit at the same time, is recommended as valuable. The aromatic spirit is prepared by distilling over a slow fire two pounds of the spiritus dulcis salis ammoniaci with half a dram of the oil of cloves, two drams of the essential oil of nutmeg, and the same quantity of the essence of lemons.

"The following may serve as a synoptical sketch of the treatment for each form.

1. *Strumous inflammation without change of texture, vascularity more or less, intolerance excessive.*

Calomel and opium, or hydr. c. cretâ and Dover's powder at night; emetic tartar to nausea; gentle alvine evacuants; diaphoretic drinks; large open blister on the nape of the neck; leeches; tepid bath; tepid or cold water washes, as most agreeable; vapor of opium; large bonnet shade; no bandages;* spacious airy apartments and light bed clothing.

2. *With recent diffused opacity of corneal conjunctiva, and vessels raised upon and over-shooting the corneal margin.*

Calomel and antimony, or opium, or any other more appropriate exhibition of mercury, to ptyalism; occasional purgatives; leeches; blisters alternated behind the ears and on the nape of the neck and temples.

3. *With herpetic ulcers of the cornea.*

The same; blisters on the temples: as the inflammation yields, sol. argent. nitrat.: vin. opii: sol. cup. sulph.: dilute zinc lotion.

4. *With pustules.*

If partial, weak zinc or alum lotion; ung. hydr. nitr.; occasional brisk purgatives; infusion of roses with additional acid; tonic bitters; calumba, gentian, &c.; blisters behind the ears, repeated if necessary. If the vascularity is diffused by the multiplication of pustules or the duration of inflammation with irritability to light; treatment as in strumous inflammation without breach. Ung. zinci et sub-acet. plumbi.

5. *With inflammation of the follicles and puriform discharge.*

Active measures at first, but not long continued. Blisters, when becoming chronic, if with thickened lids, scarifications; zinc, alum, or copper wash, dilute; ung. hydr. nitr.: hydr. nitr. oxid.: sub-acet. cupri; tonics and sedatives. If obstinate, issue or seton.

6. *Convalescent state.*

Infusion of roses; cascarilla; calumba; decoction of bark, with dilute sulphuric or nitric acid; steel: rhubarb and soda, or magnesia, as aperients. Tonic collyria and gently stimulant ointments; nutritive diet; country air; shower or sea bath in the warm months."†

VARIOLOUS OPHTHALMIA.

The variolous ophthalmia is perhaps of all the varieties of this complaint the most uncontrollable. It commences, for the most part, about the eighth or ninth day of the eruption, when the scabbing process is about to take place. It is a pustular inflam-

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* "Close bandages, I would observe, are always prejudicial. They create a morbid sensibility where it had not before existed, and greatly add to it when present."

† Travers.

mation, often associated with violent diffuse inflammation of the integuments in some part, which runs on to sloughing or gangrene, or with extensive cutaneous ulceration and hæmorrhage. This condition of the surface precludes in a great measure the employment of active measures for the relief of the eye, and the consequence is either total destruction of that organ, or such disorganization as leads to eventual blindness. Bleeding from the arm, leeches to the temples, and active cathartics, afford the only effectual means of relief. Mercury is here useless, and local applications of a stimulant kind improper.

After the inflammation has abated, the light should be gradually admitted, as the want of its stimulus keeps up and increases the morbid irritability of the eye and has a tendency to prolong the inflammation. A shade of green silk covering the eye will be found to be useful for this purpose; whilst it abates the violence of the light, it admits only those rays which are most agreeable to the tender organ.

TREATMENT OF VENEREAL OPHTHALMIA.

With regard to the treatment of the venereal ophthalmia in all its forms, a mercurial course is indispensable: It should be very gentle and gradually induced by calomel and opium, as if brought on rapidly it excites the vessels of the head, and increases the inflammation: In those cases where the system is difficult to be affected frictions may be used: They should be combined with the Lisbon diet drink, given three times a day.

TREATMENT OF RHEUMATIC OPHTHALMIA.

Rheumatic ophthalmia is treated first by attention to the digestive organs by giving an emetic and a purgative: The evacuation of the aqueous humor abates the inflammation immediately: If a sudden chill has preceded, a couple of grains of antimonial powder singly or combined with opium must be given every four or six hours, to allay the exacerbation in the evening; Bleeding is of little importance; fomentations, and blisters repeatedly applied behind the ears, or to the nape of the neck; the vinous tincture of opium dropped into the eye once or twice a day, in the last stages, after inflammation has been subdued, complete the treatment. If the tongue remain white after the bowels have been freely opened, cinchona is advised either alone or combined with the mineral acids; it must be given in small doses of five to eight grains: This last though highly praised by Mr. Wardrop, is we think dangerous.

TREATMENT OF INTERMITTENT OPHTHALMIA.

Sometimes ophthalmia assumes an intermittent form: Mr. Ware in these cases has found corrosive sublimate given with the decoction of the woods extremely useful: The bark does not agree so well with this form as with the scrophulous variety. Stoll treated it with great success by emetics, and Dobson also,—when the case was chronic and the person weak: he used the bark at the same time. In order to prevent the return of ophthalmia, blisters kept open behind the ears and an issue in the nape of the neck may be used.

TREATMENT OF THE ACUTE INTERSTITIAL ULCER.

The reduction of the inflammation which produces this ulcer will cure it;

the means formerly recommended under the head of common opthalmia will be proper.

TREATMENT OF THE CHRONIC INTERSTITIAL ULCER.

Rhubarb and aloes, as purgatives; astringent collyria; blisters to the eye; bark and opium; pure air and good diet:* When the cornea is ulcerated the application of a solution of lunar caustic (a gr. to the oz.) by a camel's hair pencil, gradually contracts and heals the ulcer; Dr. Good speaks well of the prussiate of potash applied in solution, or in the form of ointment.

TREATMENT OF SCLEROTITIS, CHOROIDITIS, AND IRITIS.

The inflammation of the sclerotica is relieved by blood letting, with antimony and opiates; according to Travers, mercury relieves it less successfully than iritis; though it is indispensable to its successful treatment, and must be managed by exciting the mercurial action gently, and then suspending it till the system has completely recovered from its influence: The alternation of this inflammation with rheumatism of the elbow, knee, or ancle joint, is a feature which deserves to be recollected. The nitric acid is often used with success in this complaint during the intervals of the mercurial action.† The same authority supports the use of corrosive sublimate in doses of one-eighth or one-twelfth of a grain, or in feeble subjects, the hydrargyr. cum creta, five grains to ten, twice a day; and as assistants to allay irritation, the hemlock, the sarsaparilla, hyosciamus, and the Dover's powder, either dissolved in the decoction of sarsaparilla, or taken freely in the solid form; he states that he has seen an obstinate chronic inflammation yield before these remedies, when mercury had been used without the least effect.‡

Mercury pushed to salivation is the remedy for iritis in the acute stage, assisted by one copious bleeding, and by local means in the after periods of the disease, repeated at short intervals: Calomel and rhubarb so as freely to open the bowels must at the same time be given: The influence of the mercury upon the system is essential to the removal of the disease; neither the lancet, continued nausea, nor full purging have any effect; the mouth must be affected as the only plan: it is equally efficacious in removing the adhesions, the result of inflammation, as it is in stopping the inflammation itself: Travers advises, that if the system be much worn down by age, or by other diseases, it must be used sparingly: it is stated, that when the system is not suited to it the eye becomes enlarged, or misshapen, the sclerotica livid, the veins congested, the eye ball suppurates, and the sight is entirely lost: During its employment, if the system be enfeebled it must be supported by nourishing diet and stimulating medicine.§

FRENA.

These membranous bands binding the conjunctiva to the eye should be divided, at the same time avoiding to inflict a wound upon the conjunctiva of the palpebra; it is also advised that no bandage should be used; and during the day the patient should not be suffered to keep the eyelids closed; escharotics also are said to exasperate the disease: Elongations and excrescences of the cornea are best treated by cutting them off with a fine sharp lancet or knife.‖

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* Travers, p. 287.
† Travers, p. 295.
‡ Travers, p. 296.
§ Travers.
‖ Travers.

NEBULA AND ONYX.

A cloudiness of the cornea was stated on the authority of Travers to indicate a highly inflamed state of the cornea; onyx is also the result of deposition between the layers of the cornea; they are both cured by all the processes which abate inflammation before enumerated.*

When the cornea is opaque, escharotics must be applied to stimulate the surface in order to remove the defect; a solution of lunar caustic one gr. to the oz. of water applied by means of a camel's hair pencil twice a day; or the unguentum hydrargyri nitrati melted in a spoon and applied accurately on the speck; or Janin's ophthalmic ointment lowered and used in the same manner.

Sometimes the opacity is supported by a growth of blood vessels going to it, the division of which completely removes it: Dr. Thomas recommends the liquor cupri ammoniati dropped into the eye every day as being useful in opacity of the cornea: I have seen a weak infusion of cayenne pepper do great good in opacity of the cornea: It was made by infusing the size of a pea of that substance in two table spoonfuls of boiling water, and then adding a few drops of it to a tea spoonful of water and introducing it into the eye; it excited some inflammation and running from the eye, which was after using it for some time followed by a gradual diminution of the opacity.

The ox gall pure or diluted is also recommended; it should be used when there is little inflammation, as it is highly stimulating.

Æther pure or diluted has been used by Mr. Ware in cases where from violence done to the eye the crystalline has become opaque; It is applied by means of a camel's hair pencil to the ball of the eye; and is followed by considerable pain, and a gradual dissipation of the opacity.

The following formulæ of collyria are taken from the practice of the Parisian Hospitals; some for the use of the student and young practitioner:

(Hotel Dieu. St. Antoine.) Infusion of the flowers of elder ℥iv. Cristallized acetate of lead gr. vi. Proof spirit ʒii.

(St. Antoine.) Rose water, Common water, of each ℥ii. Alum, ℈i.

Emollient collyrium (Hospital des Enfans). Root of marsh mallow ʒii. Water lb. i. To be used in violent inflammations.

An infusion of the pith of sassafras will answer in the same case.

Anodyne collyrium. Water lb. i. Gummy extract of opium ʒss. dissolve.

Saffron ʒi. Boiling Flaxseed tea ℥iv. Liquid laudanum ʒi. To be used in cases where the eye is very sensitive.

Astringent collyrium (Hospital des Enfans.) Infusion of elder lb. i. Sulphate of zinc ℈i. This is particularly suited for scrofulous ophthalmia, attended with purulent exudation.

Anodyne collyrium. (Charité.) Watery extract of opium grs. ii. Distilled water ℥iv.

Collyrium of the sulphate of zinc. Rose water ℥iv. Sulphate of zinc gr. xvi. Common water ℥iv. Acetate of lead gr. x.

These are particularly useful towards the conclusion of the disease.

INFLAMMATION OF THE LACRYMAL GLAND.

It often succeeds the ordinary inflammation of the conjunctiva, or other form of ophthalmia, and is distinguished by intense pain in the orbit; particularly under the temporal extremity of the eye-brow, extending into the temple and cheek; entire absence or profusion of tears, excoriation of the eye-lids, which are swelled, red and tense; sometimes the inflammation of the eye follows that of the gland: When at its height there is great fever and restlessness, pain in the head and orbit, delirium, squinting, impaired vision, and protrusion of the eye-ball.†

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* Travers. † Med. Recorder, p. 47. 1824.

General and local bleeding, mercurial and saline purgatives, and low diet form the treatment.

The chronic inflammation of the lacrymal gland is confined to early life, and more particularly to scrofulous habits: the gland is enlarged; the upper eye-lid swelled, with fulness and stiffness of the globe; and in consequence strabismus, double or indistinct vision.*

A few leeches near the part have the best effects; also blisters to the forehead and temples or behind the ear; small doses of calomel, and blue pill with the occasional use of saline laxatives. C.

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* Med. Recorder, p. 118. 1824.

CHAPTER VIII.

CATARRH, SORE THROAT, AND THE MUMPS.

Symptoms of Catarrh.—Its Causes and Consequences.—Peculiarities of the Epidemic or Contagious Catarrh.—Treatment of Catarrh.—Symptoms of Cynanche Tonsillaris.—Its Causes, Terminations, and Treatment.—Symptoms, Causes, and Consequences of Cynanche Parotidœa.

SYMPTOMS OF CATARRH.

Catarrh is the inflammation of the Schneiderian membrane. Dr. Cullen united it with inflammation of the mucous membrane lining the bronchia, but separated it from the other plegmasiæ, on the plea of a peculiarity in the mode of its termination. On several accounts it is advisable to deviate from both these points of arrangement. Catarrh is characterised by a sense of fulness in the nose, of weight or fulness in the head, with an altered state of the secretion of the part, and more or less general fever. At first, the secretion from the membrane is altogether checked. The nose is stuffed and dry. After a time a thin acrid fluid is secreted, which gradually increases in quantity, becomes opaque, and alters in colour, until at length it is restored to its healthy condition. The inflammation generally extends to the mucous membranes in the neighbourhood; and hence redness and watering of the eyes, hoarseness, a sense of rawness in the windpipe, cough, and often a degree of oppression about the chest, with difficulty of breathing, accompany the other symptoms.

This disease, if properly attended to, seldom lasts long, but by neglect it is protracted, and not unfrequently leads to severe bronchial inflammation, or to pneumonia—in scrofulous habits to affections of the larynx, hæmoptysis, and phthisis. In some persons there is a very strong disposition to catarrh, and this is one of the marks of a scrofulous constitution.

ITS CAUSES.

The only exciting causes of *common* catarrh are cold, and changes of weather; but there is a very curious variety of this disease,

which arises apparently from contagion, and is well known under the name of *the influenza.*

INFLUENZA.

From the earliest records of the world epidemic catarrhs have been noticed. In the last century fifteen are distinctly described, the most remarkable of which was that of 1782. The chief peculiarities of the contagious epidemic catarrh are, that its attack is for the most part very sudden, and accompanied with an uncommon degree of languor and debility. This usually continues through the whole course of the disease, and even sometimes after the other symptoms have declined. Its runs its course in three or four days. It is attended with a more urgent head-ache, and with more disorder of the stomach than occur in common catarrh. But severe as it sometimes is, the influenza is not a disease of danger. The bills of mortality seldom indicate any notable increase in the proportion of deaths during the existence of such an epidemic. Elderly persons are those who chiefly suffer by it, from the copious effusion of a viscid secretion into the air-passages.

On every occasion when an influenza has prevailed, the question has been agitated, whether it spreads by contagion and personal intercourse, or arises from some peculiar state of the atmosphere. Each of these opinions has found its supporters; but a third class of pathologists hold a middle course, and while they admit the doctrine of a particular contagion, maintain that it is conveyed by the air. Upon comparing the evidence which has been collected together, with the view of elucidating this point, it is impossible, I think, not to perceive, that the phenomena are best explained upon the principle, that the disease is propagated by contagion and personal intercourse. The difficulties which lie in the way of this explanation are obviated by the supposition of some *peculiarities* in the contagion of catarrh. There is every reason to believe, that the sphere of contagious influence differs in different diseases. That of small-pox has been shown by Dr. Haygarth to be very limited. Now, in the present instance, it is probable that the contagion is of a very diffusable nature—that the contagious effluvia will float to a considerable distance from the infected individual. It appears further, that its latent period is very short, perhaps not exceeding a few hours. On these principles we may account, in a manner sufficiently satisfactory, for the anomalies which the history of influenza presents. The circumstance of its travelling from the most distant parts of the world, and resisting in its progress the extremes of European heat and cold, is conclusive as to its being something more than a common catarrh, produced by variations of atmospheric temperature.

TREATMENT.

Catarrh is seldom a disease of sufficient importance to become an object of medical treatment. In many cases, it may be left with perfect safety to nature, when a spontaneous perspiration will commonly relieve the symptoms. If it prove somewhat more severe, the patient should keep within doors, abstain from animal food, take a dose of salts, and promote diaphoresis by the pediluvium and mild diluent drinks. To alleviate the cough, if it prove urgent, recourse may be had to a mucilaginous mixture, or an oily emulsion, as in the following forms: R. Muc. gum. arab. oz. i. Aq. distill. oz. iii. Syrup. Tolut. oz. i. Aq. cinnam. oz. i. M. oz. ss. quaq. quart. hor.

R. Tinct. opii. camphor. oz. ss. Vin. antimon. tart. dr. ii. Nitri sal. dr. ii. Laudan. liquid. dr. i. Mucil. g. arab. oz. vi. M. Oz. ss. pro re nat.

R. Ol. amygd. oz. i. Arab. gum. dr. ii. Aq. distill. oz. vi. Syrup. rhæad. oz. ss. M. f. oz. i. quat. die.

R. Cetac. dr. ii. Vitel. ov. oz. ss. Syrup. oz. ss. Aq. cinnam. oz. ss. Aq. distillat. oz. ivss. Oz. ss. pro re nata.

R. Ol. amygdal. vel Ol. olivar. oz. ii. Spir. sal. ammon. gtt. xxx. Aq. Fontan. oz. vi. M.

If the cough is of long standing oily medicines do no good, they pall the appetite and increase the disease.

The hoarseness and sensation of rawness in the trachea are often lessened by the use of Mudge's inhaler. If there is considerable oppression about the chest, with difficult expectoration, and fever, antiphlogistic measures of more activity must be resorted to, proportioned to the violence of the symptoms, such as will hereafter be mentioned when treating of thoracic inflammation.

In coughs with pain in the side, tightness, and restless nights, small and repeated bleedings, and if the cough is of long standing, issues in the side have a good effect. The quantity should be about 4 to 8 oz. in eight or ten days; barley water and sweet milk in equal parts make an agreeable diet: Buttermilk, and if costive, a decoction of bran with raisins and liquorice:* Saline draughts, small bleedings, and an antiphlogistic diet diminish even hectic in consumptive habits. C.

The epidemic catarrh is generally, but not invariably, more severe than the common form of the disease. The same general system of treatment is to be recommended also here. It appears of importance to promote diaphoresis and expectoration, by the employment, first, of antimonials, and afterwards of preparations of squill. Gentle aperients, and opiates at night are

* Pringle, p. 162.

advisable. On account of the debility which usually accompanies the latter stages of this disease, bark and cordials are often necessary at that period.

CORYZA MALIGNA.

There is a disease of children, which takes place in the month, usually in the first or second week after birth, or even earlier; the child makes a peculiar snuffling noise in respiration, the discharge is much more abundant than that arising from cold, and is purulent from the first, and afterwards sanious, though in some few instances there is no discharge whatever; in all cases they appear weak and delicate, without any precise complaint, incommoded more with the snuffling and stoppage in the throat than with any thing else, particularly during sleep, when they breathe with great difficulty: as they recover, it is often followed by a dangerous illness of the bowels.

According to Dr. Denman the difficulty of breathing through the nose is not constant, and when free from it, children appear to be in no danger; the difficulty of breathing is at other times so great as to require an attendant to open the mouth of the child as often as it may be requisite, to prevent strangulation.*

Dr. Denman notices also a streak at the verge of the eye-lids, considered by him pathognomonic of the disease; Underwood confirms the same statement; "Denman describes also a general fulness about the throat and neck externally, taking place soon after the commencement of the complaint; which he seems to date from the appearance of the purulent discharge from the nose: though it has been remarked, that this symptom, although one of the most formidable, may be entirely wanting.

That, when these symptoms had continued for some days, according to the strength of the patient and degree of the disease, children became pale and languid; and that upon looking into the throat, the tonsils were found tumefied, and of a dark red colour, with ash-coloured specks upon them, and in some there were extensive ulcerations. The parts on which blisters had been applied in the beginning of the disease, and which had been apparently healed, often sphacelated towards the conclusion.

The infants, he reports, gradually declined in their strength, and had a particular catch in respiration, as if the velum pendulum palati were elongated. They were unable to suck, though not universally; swallowed with difficulty whatever was given in a spoon; and died in convulsions, or with all the marks of great debility, though not on any particular day of the disease.

Dr. Denman observes, that in the course of eight months he had attended eight children in this disorder, six of whom died; that the body of one of them was afterwards opened by the late Mr. Hunter and Mr. Home, but that nothing was discovered, except that the membrane lining the nose was of a dark red colour, and its blood vessels more turgid than ordinary.

The true source then appears to be a defluxion and inflammation over all that extent of *Schneider's* membrane lining the antrum *Highmorianum*, posterior nostrils, and contiguous parts. Hence the copious secretion of purulent matter irritates the trachea, and produces that spasm, and croaking noise, with recurring sense of suffocation, so uniformly observed in this disease. By descending into the stomach and bowels, it disorders these parts; and if not very soon properly treated, induces such general disease as presently debilitates, and at an uncertain, but generally an early period, carries off the little patient in the manner that has been already described. The stools it may be noticed, are sometimes thick and pasty, and when otherwise after repeated purges, they

* See Denman, quoted by Underwood, p. 39, 40, 41, vol. i. 1819.

are of a peculiar green colour, or sometimes blue, different from what I have noticed on almost any other occasion.*"

The indication laid down by Underwood is to keep the bowels freely open, so as to remove the matter falling into them from the throat, correcting the state of the evacuations by absorbents and alkaline medicines: As the disease appears evidently to be an inflammation of the lining membrane of the nose, this must be always kept in view; and if the action be too great it must be repressed; at the same time looking also to the disposition to sink into the typhous state, and arresting it as soon as it is formed by cordials, nourishing diet, and the omission of the purgative medicine: Underwood remarks, that "it is remarkable that even weak infants endure purging better under this complaint than any other, unless it be the tooth-fever. If a convulsion fit should supervene, as it sometimes does, clysters, and the usual remedies for spasm should be administered, and especially the cordial; which breaking off wind from the stomach, and giving tone to the bowels, becomes a very useful one in this case. In several instances, a recourse to opium, or syrup of white poppies, has been attended with good effect; and may, in that case, be administered every night when the purgative has operated properly. Or a good medicine in many cases, is Dalby's carminative, which may be given every six or eight hours; and particularly when repeated doses of the laxative medicine are given through the day. From eight to twenty drops, or more may, in that case, be given between each dose of the purgative; and has, in some instances, been considered as a principal means of cure.

Under such treatment, the morbid-snuffles has been found to yield in the course of two or three weeks; some purging medicine being continued as long as the discharge or difficulty of breathing shall remain. It, however, sometimes runs on as much longer, and is attended with a spasm in respiration as if the infant were dying: this symptom, as well as the snuffling, often recurring some time after an infant has seemed to be cured; and in one case I was only a few weeks ago attending, not only the snuffling, but the discharge occurred more than once, after the disorder had seemed wholly to give way. In such instances, besides purging, it has been thought useful to foment the bridge of the nose, and afterwards apply some aromatic liniment.

When the disorder is found not only to hang on for many weeks, (as it sometimes will even where it has not been peculiarly violent;) but together with the continued use of purges, to keep the infant pallid and feeble, notwithstanding the exhibition of cordial medicines; a recourse to the decoction of oak-bark has at once removed the snuffling, and given vigour to the child in the course even of a few days—A remedy that does not seem to be sufficiently known for this, and many other complaints. Indeed, where a tonic medicine is found necessary, but where either from a febrile diathesis, or a disposition to glandular obstructions, the cortex peruvianus may be thought inexpedient, the oak-bark will generally be found a safe and efficacious medicine.

It is necessary only to add, that though this disorder had never until very lately been met with after the month, I have seen it at a more advanced age; in one, or more instances, however, it has been thought, I know not how justly, that some slight symptoms of it had, in that case, appeared in the month.†"

CYNANCHE TONSILLARIS.

Cynanche tonsillaris is the inflammation of the mucous membrance of the fauces, affecting especially the tonsils, and from thence spreading, so as to occupy, in many cases, the palate, uvula, pharynx, and membrane lining the back part of the nose.

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* Underwood, p. 41—4. † Ibid. p. 46—7.

The dryness of the throat; of the tongue and fauces; the sharp pains in the tonsils; clammy tough mucus of difficult excretion, lining the throat; the pains and difficulty of swallowing, increase as the disease advances; the tongue swells; the face becomes red and inflamed; the cheeks florid; the respiration difficult, and in some cases, delirium and coma supervene;* the swelling increasing so as to threaten suffocation.

It is readily distinguished by the redness and swelling of the internal fauces, by the difficulty of deglutition, and the accompanying fever. When the inflammation runs high, the swelling of the tonsils is sometimes so great as to impede deglutition altogether, and patients have suffered severely, under such circumstances, from hunger and thirst. It sometimes extends to the orifice of the Eustachian tube, and produces deafness. Food or drink attempted to be swallowed are sometimes returned by the nose, and this is a sure sign of very severe inflammation. In many cases, the tongue cannot be protruded without occasioning considerable pain. It is seldom that the breathing is affected.

SYMPTOMS.

The febrile symptoms which accompany cynanche tonsillaris are often urgent, and almost at all times severer than could have been anticipated from the extent of local disease, or the importance of the organ attacked. The pulse is often as high as 120, and the tongue covered with a thick coat of fur. Much febrile debility attends this disease, particularly where the inflammation, in its appearance and progress, has the characters of erysipelas, more than of phlegmon. The duration of the disease is very various. Under common circumstances it will subside by resolution in the course of a few days; but occasionally, a great degree of debility continues, and the convalescence is protracted for many weeks.†

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* Thomas.

† Sometimes the inflammation is confined to the œsophagus; then no swelling appears in the fauces: Sometimes the tongue is so much swelled that it is protruded from the mouth: The cavity of the œsophagus has been entirely obliterated, and the patient has starved to death: Sometimes the pain has been so great that food has been completely abstained from, and the patient has sunk under it: In some cases the saliva flows in considerable quantities: Sometimes the pain even extends to the diaphragm, and spasms are the consequence; the pain of swallowing alone has this effect; the saliva which is secreted in great quantities produces an involuntary desire to swallow, and convulsions take place; this happens more particularly during sleep, so that it becomes necessary to prevent the patient from sleeping long, till the saliva accumulates in the throat; or to place him in such a position that it will run from his mouth easily: When the saliva accumulates in the throat sickness is produced in the stomach, so that a person would suppose that the morbid accumulation was in the latter organ, when it really was confined to the throat.*

When the inflammation is in the throat the patient feels the greatest diffi-

* Philip on Fevers, vol. ii. p. 145—6.

1. Cynanche tonsillaris frequently terminates, when the inflammation is active, by suppuration in one or both tonsils. The rapidity with which pus sometimes forms in the loose texture of these organs is very remarkable, but occasionally six or seven days elapse before the inflamed and highly stretched membrane gives way spontaneously. The matter of the abscess is fœtid and nauseous. The bursting of it is always followed by great and instantaneous relief.

2. When the inflammation, instead of being of a vivid red colour, has an aspect inclining to purple, we consider that it partakes of the nature of erysipelas, and it will then generally be found to terminate by superficial vesicles and ulcers, of a white or grey colour, similar in their nature to *aphthæ*. These often create a great deal of alarm from their resemblance to the sloughs of cynanche maligna, but they commonly go off in a few days, and are productive of no other inconvenience.

3. In some cases, the inflammation will neither advance nor recede; and I have in vain attempted to determine upon what this depends. It is most common in persons of a scrofulous habit of body, and who from their aspect might be considered as predisposed to phthisis pulmonalis. After the lapse of a fortnight or three weeks, the disease will in such cases commonly give way, but occasionally a permanent enlargement of the tonsil remains. This, I think, chiefly occurs in delicate young women.

Cynanche tonsillaris is a disease of little or no danger, scarcely any fatal cases of it being on record. It is rendered severe by neglect; and danger may sometimes be apprehended from the tonsils pressing on the glottis. Its immediate exciting cause is, in all cases, exposure to cold, as from getting wet feet, or from sitting in a partial current of air, particularly if the body be previously over-heated. It affects chiefly the young, and those of plethoric habit. It occurs especially in the spring and winter seasons, and in cold and variable climates. Habit increases the

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culty in swallowing when he lies upon his back; it then feels as if something hard was passing down into the stomach; and the fluid, on attempting to swallow, passes up into his nose or into the windpipe:

The disease may spread into the stomach, though this is rare, or it may descend into the trachea, which is also a rare occcurrence; the pain on swallowing or breathing will shew whether it exists in the windpipe or œsophagus; the swelling of the fauces is much increased by the pressure upon the jugulars, retarding the return of the venous blood, as well as by the increased arterial action, which sometimes runs so very high that the appearance of the patient is often frightful; when the fever is great and the tumefaction is considerable, it is said that the eyes are red, staring, and protruded; the tongue livid and thrust out of the mouth; the functions of the mind impaired, from the brain being compressed by the great flow of blood to it; delirium and snoring also are symptoms; the external parts of the neck and breast are swelled and red; and the veins of the head and neck appear as if they were varicose.*

* Philips, vol. ii.

disposition to the disease, so that some persons scarcely ever pass twelve months without experiencing an attack of it, and in them it is induced by very slight causes. This affection occurs symptomatic of scarlatina, and small-pox, and it sometimes attends measles, lichen, catarrh, and croup. It is occasioned also by the poison of mercury and the venereal virus; but in all these cases there will be found sufficient in the aspect of the disease, or the concomitant symptoms, to prevent ambiguity in the diagnosis.

TREATMENT.

An antiphlogistic system of treatment is required in cynanche tonsillaris, but venesection is seldom, if ever, necessary. Leeches to the external fauces have been recommended, and are frequently very serviceable. If the inflammation runs high, the tonsils, or more properly the velum pendulum palati, may be scarified, and a little blood so obtained affords very effectual relief.* In slighter cases, it will be sufficient to rub the throat with some rubefacient liniment, as the *linimentum ammoniæ;* and to direct the frequent use of a repellent gargle, as of the infusion of roses with a due proportion of tincture of capsicum: R. Infusi Rosæ oz. ix. Mellis Ros. oz. ss. Tinct. Caps. oz. ss. M. f. gargarism. R. Acid. sulphuric. dilut. gtt. xxx. Decoct. Hordei. oz. viii. M. R. crem. tart. oz. ss. Mell. despumat. oz. ii. Aq. Hord. oz. viii. M. In all cases, a saline purgative, as an ounce of the sulphate of magnesia, is advisable; but if much fever be present, the patient should be confined to bed, and the following saline draughts administered: R. liquor. ammon. acetat. ʒiii. Aq. menth. sativ. ʒvi. Syrup. aurantior. ʒi. M. f. haust. quart. hor. repetend.—R. Subcarbon. potass. gr. xviii. Succ. limon. oz. ss. Spirit. myrist. gtt. x. Aq. distill. ʒvi. M. capt. quaq. tert. hora. If suppuration is likely to take place, it may be promoted by the employment of mild emollient gargles, as of the dec. hord. compos. of the London Pharmacopœia. An emetic is sometimes directed with perfect safety, with the view of promoting the bursting of the abscess.† The decoction of bark may be employed as a gargle when there are superficial ulcerations or

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* I have seen the disease on its first appearance cut short by the prompt exhibition of an emetic; a copious bleeding has also had the same effect. The application of a blister or mustard poultice round the throat is often of the greatest benefit; it suspends the disease completely. All gargles should be abstained from, if resolution is to be attempted.

† An emetic also often causes an abscess to burst if it is sufficiently ripe, when it is in situations so low down in the œsophagus as to be beyond the reach of surgical aid; it is evident, that it it will be improper to use this remedy when the blood-vessels of the head are ingorged, and when from the pressure on the jugulars by the swelling the return of blood is prevented, as effusion on the surface of the brain may be the result.

specks, but taken internally it will be found to aggravate the febrile symptoms.* As long, therefore, as the pulse remains frequent, with thirst and restlessness, saline draughts only should be given. When the fever subsides, the decoction of bark and acid may be administered with advantage: Decoct. cinchon. Infus. ros. comp. sing. ʒvi. M. f. haust. ter in dies repetendus.

When the disease is disposed to be stationary, a blister to the fauces, or better to the upper part of the sternum, or behind the ears, will prove useful.† In the state of chronic enlargement of the tonsil, little can be done by internal medicine; and gargles, even of the most powerful kind, are generally quite ineffectual. The disease sometimes yields in the most unexpected manner, probably in consequence of some change taking place in the constitution, the nature of which is altogether inscrutable. Some have recommended the removal of the part, either by the knife, or by ligature, when the disease has lasted a considerable time.

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* The gargles in this case should be stimulating but should not be swallowed, and should be applied with as little motion of the throat as possible by means of a syringe: The following will be found to be valuable: R. decoct. cinchon. ℥vii. Alum. sulphat. ʒi. M. And if there should be a tendency to gangrene, the following may be used with effect: Cayenne pepper ʒss. Hot water ℥iv. Add three oz. of decoct. of Peruvian bark, and acidulate it with oxymuriatic acid. Or apply a gargle strongly acidulated with oxymuriatic acid, and sweetened with honey to the parts: or of cayenne pepper ℈ii. infused in ℥vi. of vinegar—or the decoction of bark ℥v. in tincture of capsicum ʒii. Port wine ℥iii.

† The application of warm fomentations or poultices to the throat, or the direction of the vapour of warm water against the fauces to stimulate the parts and encourage suppuration, have been advised when the disease cannot be resolved: The heat of the system excited by fever, and the inflammation of the parts, which are so situated as not to require the aid of poultices, are alone sufficient to produce the suppuration: and in a little time will effectually answer the purpose:

If the tumour should be so large as to impede respiration, a deep incision with the knife will generally lessen it sufficiently to render the breathing free. If it does not, the operation for bronchotomy has been advised, attempting previously by giving emetics to break the tumour: The last is a rough expedient: a free incision into it is the best and easiest mode of relief:

Sometimes there are strong spasms of the œsophagus, appearing as an idiopathic disease; in which remedies are unfortunately of very little service; The plan of depletion is principally to be relied on: Van Swieten recommends a soap composed of oil of turpentine, vegetable alkali, and acetate of ammonia, to be applied externally, and also to be used internally if it can be swallowed; the relief, however, obtained by oily and emollient medicines is seldom permanent: Antispasmodic remedies, but more particularly opium, are recommended to be given internally in this case: Dr. Johnston thinks that opium and extract of cicuta promise most; they may be made into pills and held in the mouth; mechanical force has sometimes been employed, to dilate the part, which is spasmodically contracted: This, however, has been fatal: If the contraction of the œsophagus is owing to schirrus, which sometimes follows this disease, or to an induration of the lymphatic glands of the neck, it must be treated, the first by bougies, the second by the remedies for scrofula.*

* Philips, vol. ii.

In many cases this may be done with great propriety; but as a general rule it should not be resorted to, unless the breathing be impeded, or cough or some other serious inconvenience be produced.

CYNANCHE PAROTIDŒA.

Cynanche parotidœa, or the mumps, is the inflammation of the parotid gland, interesting chiefly in a pathological point of view.

It begins by symptoms of fever, soon followed by swelling of the gland, appearing as a tumour at the corner of the jaw, and gradually extending over the face and neck. The swelling continues to increase till the fourth day, and then usually goes off by resolution. The disease chiefly attacks children. It is often epidemic, and manifestly contagious. Occasionally however it attacks adults, occurs *sporadically*, and is attributable to cold. In a few cases it has been known to terminate by suppuration.

There are many grown persons, who are liable to the cynanche parotidœa, and the disease is usually more inflammatory in such subjects, and more likely to be translated to the testes and mammæ. Children are rarely affected by these metastases, and in adults there are ten cases of swelled testicle to one of inflammation of the mammæ. The rationale of so many exemptions from mumps, is to be sought for in the acrid exceedingly volatile nature of the contagious effluvia secreted by the parotid glands. It cannot be communicated more than two or three feet, and hence many persons may be in a room with the sick and escape the contagion. It does not adhere tenaciously to clothes, or other articles of furniture, and is probably seldom communicated in that way. The affection of the brain we judge is seldom, if ever, derived from the inflammation of the parotids. We have never seen but one case attended even by the slightest delirium, although we have treated five phrenitic cases which succeeded to the inflammation of the testes, and one that followed the affection of one of the mammæ. In such cases the tumor of the parts subsides or disappears, as the cerebral symptoms increase. Violent exercise, repletion, and spirits, or whatsoever stimulates the system in a high degree, may excite phrenitic symptoms, at any time during the swelling of the testes or mammæ, and even after they have subsided; because of the exquisite sensibility of the parts and their concert with the brain. That these sympathetic affections can be prevented by blood-letting, purging and rest, there can be no doubt. We have never observed either of them, whilst the patient was under such a regimen, which ought always to be rigidly enforced to obviate symptoms, more formidable than the primary disease.

The position that this disease is referable to a low temperature is untenable. Universal experience will prove, that in an average of twenty years there are as many cases of mumps, in the heat of summer as the cold of winter. This month, (July 1826) is an example. We incline to believe it more contagious in winter. It appears in the United States, under all temperatures, alike in force and frequency, epidemic and sporadic.

There is an inflammation of the parotids from cold, but it is not contagious, and can be received more than once. It is from this fact that some have erroneously concluded, that mumps are not contagious. These diseases are easily distinguished. That which originates in cold is circumscribed, confined principally to the parotid though it sometimes affects the internal throat in some degree. It does not swell the cheek or neck, and never assumes the tense shi-

ning appearance, so characteristic of the contagious affection. That which acknowledges cold for its cause is never translated to any other glandular part. P.

The most curious circumstance connected with the history of the mumps, is its tendency to affect the testicle by metastasis, and this most remarkably when it occurs in adults. The testicle swells as the inflammation of the parotid gland subsides; but this secondary affection seldom lasts long, or proves troublesome. In a considerable number of cases, a further translation has taken place to the brain, and symptoms of genuine phrenitis have supervened.* It does not appear that either of these metastases can be prevented by medical treatment, or that they are relieved by any attempts to bring back the inflammation to its original seat. They must be treated in every respect as idiopathic inflammations of the testicle and brain.

TREATMENT.

Setting aside this consideration, the mumps can scarcely be said to require medical assistance. A saline purgative, warm fomentations, and confinement to the house, are all that it appears necessary to insist upon.

Bleeding, both general and local, free purging, nauseating doses of tartar emetic; and blisters near the seat of the inflammation, when it occurs in the head; and cooling applications and suspension when the testicle is affected, are useful. Sometimes an atrophy of the testicle takes place leaving the scrotum an empty bag; In women about the period of the cessation of the menses, the parotid takes on a chronic state of inflammation, which sometimes ends in suppuration and is troublesome; then the antiphlogistic plan with leeches and purges is necessary; emetics have also been found useful, particularly by the preparations of antimony: As the ulcerations which succeed the suppuration spread wider and wider, the patient is gradually wasted and at length falls a victim. The disease appears to depend upon a peculiar state of the general system, for which, emetics appear to be the best remedy.†

Dr. Pierson, a writer in the N. England Journal for 1824, gives some interesting facts on the history of this disease: The phlegmonous swelling of the parotid, to which scrophulous children are particularly liable, is most likely to be confounded with it: The mumps always begins to affect the parotid and then extends to the glands below; it rarely increases after three days, in which it differs from the scrofulous tumour.

The translation to the brain sometimes ends in convulsions and death: suppuration he considers as rare in this disease, and when it does take place, the glands are not affected: sometimes permanent induration is the consequence, particularly in scrofulous habits: Dr. Pierson considers the use of mercurials as peculiarly dangerous, as they produce abscesses of the gland; and he thinks, that blisters effectually prevent metastasis to the brain, &c. C.

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* See a very instructive history of an epidemic mumps that prevailed on board His Majesty's ship Ardent, in November, 1807, by Mr. Noble.—Ed. Med. and Surg. Journal, 1808.

† Good, vol. ii. p. 226.

CHAPTER IX.

INFLAMMATION OF THE LARYNX AND TRACHEA.

Laryngeal Inflammation—Symptoms of Acute Laryngitis—Its Causes and Treatment—Symptoms and Progress of Chronic Laryngitis—Smptomatic Affections of the Larynx—Treatment of Chronic Laryngitis—Of Croup—Its Symptoms and Progress—Of the disposition to Spasm in Croup—Of the Spurious or Spasmodic Croup—Appearances on Dissection—Causes of this Disease, Predisposing and Occasional—Treatment of Inflammatory Croup—of Spasmodic Croup—Of Bronchial Polypus, or Chronic Croup.

LARYNGEAL INFLAMMATION.

The inflammatory affections of the wind-pipe, though comparatively rare, are yet diseases of great importance; for this organ is essential to life, and the smallest disturbance of its function is sufficient to put life in danger. Inflammation of the larynx and trachea may co-exist, but they oftener occur independent of each other; and as their pathology is in many respects different, we shall consider them as distinct diseases. The larynx is subject both to acute and chronic inflammation, and these will require separate consideration.

SYMPTOMS OF ACUTE LARYNGITIS.

Acute laryngitis is a very uncommon disease, and, until lately, appears to have been overlooked by authors. The fullest, and I believe I may add the original account of the disease is by Dr. Baillie* in 1809, whose observations comprise almost every thing hitherto known concerning it. Since the appearance of Dr. Baillie's paper many well marked cases of the same affection have

* Vide "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge," vol. iii, page 275. A very distinct case of acute laryngitis, with dissection, had previously been detailed by Mr. Mayd. See Med. Communications, vol. ii, page 479. 1789.

been published by Dr. Farre, Dr. Arnold, and others. It is characterized by fever, pain referred to the larynx, difficulty of breathing and of swallowing, hoarseness, or complete loss of voice, and spasmodic exacerbations of all the symptoms, creating a sense of suffocation which is urgent in the extreme. In some cases the pain is increased by pressure upon the thyroid cartilage. The disease is attended by the perpetual hawking, or spitting up of a tough gelatinous mucus. If the epiglottis partake of the inflammation, which it often does, any attempt to pull the tongue forward will be attended with pain. In the course of the disease, the cellular membrane in the neighbourhood of the larynx has been observed to take on inflammatory action, from which has resulted hardness and fulness of the throat externally. In mild cases deglutition is but little impeded; but in most of the severe cases on record, the attempt to swallow fluids is followed by a violent spasm, sickness, and vomiting, and the fluid itself is sometimes forcibly rejected by the nose. The usual duration of the disease is four days. It is one of the most urgent danger.

On dissection, the inner membrane of the larynx is found red and thickened, or œdematous. Pus is frequently met with in the sacculi laryngis; and sometimes, though not often, there is an effusion of coagulable lymph upon the membrane, as in croup.

Sometimes the inflammation extends to the lungs, with a slight effusion of serum into their cellular texture, with also adhesions of the pleura to the ribs.

CAUSES.

Acute laryngitis has only been known to arise from cold. It occurs chiefly in persons turned of forty, and Dr. Baillie suspects that a disposition to it is given by previous attacks of cynanche tonsillaris. As far as my observation extends, it occurs chiefly in languid and exhausted habits, and is *preceded* by a long period of debility, and mental anxiety. It seems to prevail mostly in the months of March and April. The diagnosis from cynanche tonsillaris is sufficiently obvious. From cynanche trachealis, it is distinguished by the want of that peculiar sound of the breathing which we shall presently speak of, and by the period of life at which it occurs.*

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* The perpetual hawking rather than a forcible and involuntary cough as if the patient wished to clear the passage, and the nature of the matter thrown up, which is of a viscid mucous character, also are distinguishing symptoms.† In croup, if there be any expectoration, it is towards the close of the disease, and consists of inflammatory membrane which is exuded during the first stages upon the surface of the trachea.

In laryngitis, suppuration is the result of the diseased action; in croup, the inflammatory membrane. C.

† Good, p. 231.

TREATMENT.

The treatment of the disease is to be regulated by the view which has been taken of its pathology. A very prompt and vigorous practice can alone offer any prospect of successful termination. Large bleedings are required; and at the onset, they should be pushed so as to produce fainting. Leeches may be applied to the throat when the violence of the symptoms has been subdued; and a brisk cathartic given as soon as the power of deglutition has been in some degree restored. Any attempt however to give medicines internally while deglutition is dreaded, will aggravate the sufferings, without lessening the dangers of the patient. The bowels should at first be opened by means of emollient glysters.* The evident tendency to spasmodic exacerbation in this disease renders it probable that opium may be advantageously given, when the proper evacuations have been premised. As a last resource, some have recommended tracheotomy; but, upon the whole, considering the disadvantageous circumstances under which the operation must here be performed, it can scarcely be thought advisable.

Such is the minuteness and number of the vessels of the part, that it is exceedingly difficult to unload them, by blood-letting, general or local, even where the most active practice is pursued. Would it not be advisable to open the laryngeal artery, and thus make a radical attack upon such an adversary?

The author does not seem to be sensible of the extensive usefulness of calomel, as an auxiliary to the lancet after the rage of inflammatory action has abated. To render us much service the doses should be liberal, from five to ten grains every third hour, or even in larger doses, should re-action require them. A salivation is seldom effected, by any quantity of mercury; but in such an event, the symptoms vanish. Mercury subdues the disease occasionally, without giving the least evidence of constitutional effect. P.

CHRONIC LARYNGITIS.

Chronic inflammation of the larynx is far from being so rare as the acute form of the affection. It usually begins by pricking pains in the larynx, some degree of fever, cough, and difficulty

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* The continual nausea excited by tartar of antimony given in small doses has a valuable effect in keeping down the irritation; it must however not be carried so far as to excite vomiting, as the exertion and straining produced by its operation must increase the inflammation and turgescence of the diseased parts. The effect it produces upon the skin in relaxing the pores also is valuable, and tends to abate the force of the disease.

The application of blisters also to the throat after the parts have been sufficiently depleted by leeches will have a good effect: The semi-cupium, the free use of nauseating sudorifics with the inhalation of the vapor of vinegar and water by the inhaler of Mudge, should also be tried.

When suppuration takes place the use of emetics has been advised to prevent suffocation by rupturing the abscess. C.

of breathing. The most striking symptom of the disease, when fully formed, is the long inspiration which occurs in consequence of the constriction of the glottis. The breathing is attended too with a peculiar noise, not unlike that which characterizes croup. To these symptoms are usually added, a copious but difficult expectoration of ropy mucus, a peculiar hoarseness or huskiness of voice, and often some degree of pain of the chest. The disease is attended by a slow, or hectic fever. The pulse is never full or strong, but always very frequent. The skin is hot, the tongue cherry red and dry, and the bowels costive. As the disease advances, respiration becomes more and more difficult, and is aggravated in paroxysms, during which the face often becomes livid. The patient at length dies from suffocation. The duration of the disease is various, extending from three to twelve months.

On dissection, ulceration is found within the larynx, generally in the sacculi laryngis; and along with this there is commonly some degree of thickening of the surrounding parts, and in a great majority of cases, ossification: spicula of bone, that is to say, are to be felt within the ulcerated cavity. This phenomenon is not peculiar to ulcerated states of the larynx. I have observed it in a variety of other cases of internal ulceration. Upon what pathological principle this connection of ulceration with ossification depends, has never, as far as I know, been hitherto explained.

TREATMENT.

The repeated application of leeches to the throat affords the best prospect of relieving this very dangerous disease. Vomiting is allowed by all to be very prejudicial, as it creates much pain. Any expectorant medicines which may be given, therefore, should be of the mildest kind. Alterative courses of calomel, cicuta, and opium, are usually recommended, with the decoction of sarsaparilla, and a milk diet. Blisters may be tried. Bronchotomy has been performed in several cases, in some of which it has proved partially, and in a few permanently beneficial.

It succeeded in a case, related by Mr. Crampton; the aperture in the trachea was made in the form of a rhomboid, which rendered the use of the tube unnecessary, as it could be cleared by a probe with a piece of lint on the end of it. C.

Permanent hoarseness, unattended by pain, fever, expectoration, or any other mark of disease, is far from being uncommon. It appears to consist in a thickening of the membrane lining the larynx. This, and probably all states of chronic inflammation and ulceration of the larynx, are symptomatic of some constitutional affection, generally of scrofula, and a diseased state of the larynx is frequently complicated with true tubercular phthisis,

constituting that variety of the disorder termed *phthisis laryngea.* I have seen it originate also in a constitution worn down by syphilis and mercury. In the progress of consumption, particularly towards its latter stages, it is not unusual to find a violent pain come on, referred to the larynx, and attended with hoarseness. From the violence of the pain, it might be supposed owing to inflammation; but leeches and blisters are of no service, and it generally goes off in four or five days. It is probably a sympathetic pain, connected, perhaps, with the recurrent nerve. Dr. Cheyne, in his pathology of the larynx and bronchia, speaks of an affection, in every respect similar to that which we have called chronic laryngitis, happening as a consequence of measles. It prevails chiefly among children of scrofulous families, and proves very fatal.

"*Chronic Inflammation of the Larynx and Trachea.*—This disease occurs frequently in this country, and, upon the whole, I think it more common among men than women. It is often confined to the inner membrane of the larynx and the upper part of the trachea; but frequently it spreads downwards, even to the inner membrane of the bronchia. This disease always continues several months, and often, with short intervals of amendment, for years. Not unfrequently it lays the foundation of future phthisis. Remedies generally produce only a very gradual influence upon the disease, and sometimes none at all. Benefit is not unfrequently derived in some degree from the repeated application, at short intervals, of leeches to the fore part of the neck, or the skin covering the upper bone of the sternum. The frequent application of small blisters to the same parts will occasionally be of use; but, perhaps, the most useful remedy is a small seton inserted under the skin of the side of the neck, very near the larynx. Internal medicines often produce very little good effect; but the medicine which I have found, upon the whole, to be most beneficial, has been the extractum conii. I have sometimes directed five grains of it to be taken three times a day for many weeks together, with manifest advantage."—*Dr. Baillie's works.*

CROUP.

Croup, or the acute inflammation of the mucous membrane of the trachea, was not described with any degree of clearness by the ancient authors. The first regular history of it is to be found in the letters of Martin Ghisi, 1749. Dr. Home of Edinburgh, made it known to the practitioners of this country by his "Enquiry into the Croup," published in 1765. For the fullest account of the disease which has since appeared, we are indebted to Dr. Cheyne.*

SYMPTOMS.

Croup is characterised by inflammatory fever, a sonorous inspiration of a very peculiar character, and difficult respiration, ag-

* The Pathology of the Membrane of the Larynx and Bronchia. Edin. 1809.

gravated in paroxysms. It prevails chiefly from the first to the third year of life; and though occasionally met with as late as the tenth or twelfth year, it is yet clear that the tendency to it diminishes in a remarkable manner as life advances. The almost complete immunity from genuine croup enjoyed by adults, is perhaps referable to some alteration which the mucous membrane of the trachea undergoes about the age of puberty. It is not to be understood, however, that in advanced life inflammation never affects the trachea, but merely that the symptoms of such a disease are not then distinguishable from the more common varieties of *pneumonia.*

Adults are not altogether exempt from tracheitis; there are many exceptions to this general rule. We have witnessed more than twenty cases of distinctly marked inflammation of the mucous membrane of the trachea within as many years. P.

The true symptoms of croup are often preceded by those of common catarrh, and sometimes by ulcerated sore throat. Occasionally, however, they show themselves from the very first, coming on towards the evening, or perhaps during the night. The child wakes with an unusual cough; and the inspirations, particularly those which immediately follow the cough, are long, and attended with that crowing noise, which is the most striking characteristic of the disease. Feverish symptoms succeed, and often run high. The pulse is frequent and hard, with thirst and extreme restlessness. The natural functions, as well as those of the brain, are not always disturbed to a corresponding degree. I have seen a child taking food and running about, while the disease was making rapid advances. If it proceed unchecked, all the symptoms are quickly aggravated. Respiration becomes more laborious, the cough troublesome, and the expectoration difficult, until the child dies, either suddenly in a paroxysm of dyspnœa, or more gradually by *suffocation.* The usual duration of the disease, when violent, and uninfluenced by medical treatment, is about thirty-six or forty hours. Its danger is such, that if the alarming symptoms are not moderated during the first twelve hours, it generally proves fatal. If by the efforts of nature or art, the child recovers what has been called the *second stage*, the convalescence is always tedious, and is attended by the expectoration of portions of a membrane, whose origin and nature will presently be noticed. In a milder form of the disease, where the difficulty of breathing is not so urgent at the commencement, the cough about the second day becomes loose and the skin moist, the fever abates, and the voice gradually recovers its natural tone.

The disease terminates by a spontaneous flow of perspiration, by vomiting, diarrhœa, a discharge of phlegm from the nose, by salivation, by a copious

sediment in the urine, and by an eruption of little red blotches on the surface; The disappearance of the quick and hurried pulse, of the anxiety and oppression, the recovery of the natural state of respiration, pulse, skin and evacuations generally, are signs of returning health. C.

OF THE DISPOSITION TO SPASM IN CROUP.

One of the most important considerations in the history of croup, is the disposition which it shows to occasional *exacerbations* of all the symptoms. This tendency to spasm is apparent in all the diseases which affect the air passages, whether arising from inflammation or not. It is observable in laryngitis, acute and chronic bronchitis, hooping-cough, and asthma. It is no less manifest in croup; and some have contended that these exacerbations mark the true nature of the disease, and point it out as one of a *spasmodic*, rather than of an inflammatory nature. Such an opinion is countenanced by the well ascertained fact, that children are occasionally affected by a kind of *croupy* inspiration, apparently the result of spasm of the muscles about the glottis, which abates and recurs, without producing in the intervals any unpleasant effects. To such a disease the term spasmodic or *spurious* croup has been applied.* It is frequently accompanied by partial, and sometimes by general convulsions, or other marks of cerebral irritation.† It is reasonable to presume that these cases depend principally upon the high degree of irritability in the child's system; but they have for their exciting causes, painful dentition, a foul state of the stomach, or accumulations in the bowels. The diagnosis of this, the spurious, from the true inflammatory croup has excited much attention. It is, however, not always easy, nor am I inclined to attach any great degree of pathological or practical importance to it; first, because there is reason to suspect that the one may degenerate into the other; and

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* If time and space would permit of the necessary reasoning, it would not be difficult to demonstrate, that no spasm can be formed in croup, nor in either of the diseases, of which the upper appendages of the lungs are the seats. The inflammation sometimes extends from the lining of the trachea to the muscles surrounding the glottis, and in other cases it commences in those muscles, and travels downwards, but the situation and the office of all muscles is such, that they never can close the passage into the windpipe. When in a state of inflammation an irritating cause acts upon the muscles, great pain and tension are excited, but they are so completely antagonized that they cannot close the passage.—The sonorous cough, which has sometimes been compared to the barking of a small dog or a fox, is occasioned by the rigidity of the inflamed muscles. In such cases the voice is much louder and more shrill than in health. Nothing but blood-letting freely, will remove this inflammation in its highest degree. P.

† Consult Dr. Clarke's Commentaries on the Diseases of Children, chap. iv. page 87.

secondly, because the chief danger in croup arises from neglecting the disease in its early stage.

This spasmodic affection about the glottis is only important as it sometimes is attended with little arterial excitement; and does not require the use of the lancet, but is best managed by antispasmodics: It is the spasmodic asthma of Millar, Parr, and others: It is distinguished from the common asthma by the stricture and wheezing commencing and being confined to the breast; the voice in common asthma is not stridulous; but the breathing is wheezy; In the spasmodic asthma of Millar, the voice is stridulous but the respiration is not wheezy, showing that the one is seated in the lungs, the other in the larynx. The diagnosis of this disease, from croup, must be acknowledged to be difficult as the author states; Dr. Parrish of Philadelphia has given the history of a number of cases, in which he thought bleeding improper, and trusted to the use of antispasmodics, as the volatile alkali and ol. succini; the pulse in these cases was weak, and there was no evidence of inflammation; the respiration was, however, at times spasmodic. We believe that the croup, like all other diseases, is capable of a great variety of diatheses, from the most acute to the typhous forms, and that it also affects the trachea in different degrees of extent; sometimes confined to it alone, and sometimes also involving the lungs; so that the practitioner must by a cautious examination of the symptoms make up his opinion how far it is inflammatory or typhous, and adapt his views and plans accordingly. It must, however, be recollected, that as in children the diathesis is almost always inflammatory, of course the typhous form is more rare. There is one consoling circumstance to the practitioner in the treatment of this disease; emetics are always proper in all its forms, and often alone cure them; therefore, when bleeding is suspected not to be proper, emetics will answer every purpose, and be found to be effectual even in the typhous state; If they should not mitigate the symptoms, and the excitement be considerable, then bleeding may be tried. C.

APPEARANCES ON DISSECTION.

Examination of the trachea, in those who die of croup, has made us acquainted with a very peculiar morbid appearance; viz. an adventitious membrane, or tube of coagulable lymph, which is thrown out by the inflamed vessels of the trachea, and in a great measure blocks up the passage. It arises a little below the larynx, and extends, in many cases, to the bifurcation of the bronchia. A semi-purulent fluid is commonly found in the trachea at the same time, and occasionally traces are also met with of pulmonic inflammation. Frequent as is the appearance of such a præternatural membrane in those who die of croup, it is by no means to be considered as a constant or necessary part of the disease. Its formation is often indicated by the manner in which the child breathes—throwing the head back, so as to put the trachea upon the stretch.

This is a secretion from inflamed vessels, and presents all the different consistencies from the smallest change from health to the secreting process perfectly formed in inflammation; the condition of the vessels seems to be incompatible with secretion, and in many dissections we find the vessels injected with red blood only. The secretion of the more compact form, to which the appellation membrane has been applied, seems to be the fibrine of the blood

semi-organized, such as we see it, where adhesions are formed between membranous parts. This body is sometimes found not only throughout the bronchial bifurcations, but throughout many of their extreme ramifications into the smallest air cells. This fact was beautifully demonstrated in the body of a child of fifteen months old, which we prepared for the demonstration of the late Professor Wistar in January 1795. If we macerate the membrane found in the trachea in water and thus separate the internal softer parts from the more compact, we find it to consist of numerous rectangular fibrous lamellæ completely identified with the fibrine of the blood, collected by stirring it while flowing from a vein with a rough body, the red globules being washed off. We have preserved and compared these substances and no physiologist or pathologist can discover the least difference. Chemically treated they correspond, unless we say, that the membranous matter imparts rather the character of albumen: but fibrine and albumen are so nearly allied that it is almost impossible to say in what the difference consists. Perhaps the greater proportion of alkali in the latter renders it more soluble in water, but we dare not credit the assertion that fibrine will not dissolve in the same fluid; although it is with difficulty effected.

The croup is no more contagious than pneumonia or rheumatism; but it is sometimes hereditary. It is as often founded on hereditary predisposition, as gout or phthisis, and this proclivity to tracheitis does not always depend upon a scrofulous diathesis. This is one of the sources of error. Because several children in the same family are affected at the same time, they are supposed to have contracted it by contagion.

As to the treatment, emetics of ipecacuanha oppose a very feeble resistance to the vehemence of this disease, except in the slighter degrees of inflammation. It is well known, that there are many examples in which the strongest emetics have failed to act, and that the hyperoxigenated mur. of mercury has been resorted to, sometimes with success. We have witnessed the failure of twenty grains of the tartrate of antimony and potash to effect a single emesis on a child of twelve months old. P.

The croup has been divided into the idiopathic and symptomatic; the idiopathic or original inflammatory affection of the trachea and bronchiæ, and the symptomatic, which follows the aphthous sore throat, the measles, small-pox, scarlatina, cynanche maligna: It is distinguished from the asthma, by the ringing crowing sound, by the shrill small voice, the high coloured urine and the febrile heat which appear in croup; in asthma there is little or no cough and there is some evacuation, such as belching, vomiting or purging: in asthma the pulse is not febrile, nor full; the urine is limpid and the voice croaking and deep.*

EXCITING AND PREDISPOSING CAUSES.

The most usual exciting cause of croup is cold, and particularly exposure to a damp atmosphere. It prevails, therefore, chiefly in winter and spring, and is more common in the cold and temperate climates than between the tropics. Children who have once had an attack of croup, are liable to have it renewed on the application of very slight causes. A common catarrh will, in such constitutions, be often attended by croupy symptoms, until the thirteenth or fourteenth year of life. Second attacks of croup are seldom so violent as the first, but they always require the utmost caution on the part of a practitioner. Pathologists

* Thomas, p. 154.

have almost invariably agreed in stating that the croup is not contagious. Some cases, however, which have lately fallen under my care, incline me to believe, that this opinion has been adopted without due consideration; and in a disease so violent and fatal as croup, it is highly important that this question should meet with attention. It is acknowledged by Dr. Cheyne, that in those cases which are attended, at the commencement, by a sloughy state of the fauces, a suspicion of contagion may be entertained; but he suggests that these are cases of cynanche maligna, upon which croupy symptoms supervene. Such an explanation of the circumstance is certainly plausible, but without attempting to determine whether it be pathologically correct, I feel myself bound to act upon the principle, that croup, in its worst or most malignant form, is capable of being communicated by *contagion.**

TREATMENT.

With a view to treatment, croup has been divided into two stages; the first being that of inflammatory action, the second being distinguished by the formation of that præternatural membrane which we have already described. During the former, the chief reliance is to be placed on general and local bleeding, the warm bath, blisters, an emetic, and occasional purgatives. If these means fail to give relief in the first period of the disease, the object is then to promote expectoration, to relieve the disposition to spasm, which so generally prevails at that time, and to support the strength of the system, which will commonly be found to have suffered from the previous measures of depletion.† For these purposes, recourse may be had to preparations of squill, camphor, æther, digitalis, and opium, and to various medicines of the tonic and cordial kind. Some add to this an occasional emetic, the exhibition of small doses of calomel, and, as a last resource, bronchotomy. To this sketch of the general plan of treatment in croup, I shall subjoin a few practical suggestions.

A vomit of ipecacuanha, administered at the very outset of the disease, appears in some instances to have checked it altogether. The continued exhibition of emetics, with the view of removing the mucus or lymph, which may be collected in the trachea, is a practice which cannot be recommended. Some authors have noticed, that there is difficulty in exciting vomiting in this disease, but this I have never experienced. In a few

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* This question is considered, and various cases cited, illustrating the facts, in the Lond. Med. and Physical Journal for Oct. 1825, and Jan. 1826.

† Potion for the croup. Infus. of Polygala oz. iv. Syrup of Ipecac. oz. i. Oxymel. of Squills. dr. iii. Tart. Emetic gr. iss. Oz. ss. every hour or two.

cases, on the contrary, I have found vomiting a very troublesome symptom. The great nicety in the treatment of croup consists in the management of the general and local blood-letting. Children do not bear the evacuation of blood like adults ; and in this disease it has appeared to me to increase, in some instances, the disposition to spasm about the glottis. The relief, however, afforded to the breathing, by taking away a few ounces of blood, from the jugular vein, in a full stream, is always great and immediate, and should never be neglected in the early periods of the disease. If the symptoms recur, and the pulse continues hard, it may be repeated a second time, but a few leeches to the throat will often supersede the necessity of further depletion from the system.* The following draught may be given every

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* From the best experience in the United States the blood should be promptly and freely taken from the jugular vein, till the pulse flags, in children, three or four years old: but where the child is very young the rapid detraction of blood is sometimes followed by fainting, which is fatal; Bleeding by leeching in very young subjects is therefore preferable.

After bleeding, emetics are the most important remedy: the antimonial wine given in the dose of a tea-spoonful every half hour till it operates freely, will with the free use of venesection arrest it immediately. In general, in this country the free exhibition of emetics is attended with no bad effects. Indeed in the forming stage, characterised by hoarseness, a slight stertorous cough, a vomit of antimonial wine, tartar emetic, of lobelia inflata, ipecacuanha, or oxymel of squills, which will operate four or five times generally, puts an immediate stop to the disease, without the necessity of venesection:* Assisted by a mustard poultice to the throat and a dose of calomel, they succeed in arresting it in one out of twenty cases. Dr. Hosack considers that moderate is preferable to copious venesection in this disease: he relies principally upon the union of emetics administered immediately after bleeding; and states that large bleedings relieve the urgent symptoms at once, yet their effect is deceptive, as without the assistance of emetics immediately after it does not continue; These remedies with the warm bath, a large blister to the throat covering the trachea, and a cathartic of calomel from five to ten grains repeated every two hours until it produces some sensible effect, at the same time using injections, and the strictest low diet, have succeeded in his practice. As Dr. Hosack's experience is drawn from a locality near the sea-board his cautions apply no doubt to that district; In Philadelphia large bleedings succeed best. A valuable expectorant and emetic which may be administered both in the forming and inflammatory stages, is the form of compound syrup of squills; It should be continued every half hour till the hoarseness is relieved.

Perspiration, loose and free expectoration, warmth of skin, with an increase of the pulse, the voice becoming natural and a general mitigation of the symptoms of difficult breathing, with an eruption of little red blotches on the skin, evince that the condition of the patient is improving: If, however, the arteries should again beat strongly, the skin become dry, the face red, &c. venesection must be had recourse to.

With regard to the use of local bleeding by leeches Dr. Dewees considers that it often does harm by the exposure of the surface to cold and the slowness of the operation, and the uneasiness of the patient during the abstraction of blood. This is certainly a consideration of importance: Blood should be taken from the arm, and irritants applied to the throat, which will, when the system

* Rush Med. Obs. vol. iii. p. 377. 1809.

two hours, R. Potass. nitrat. gr. v. Aq. menth. puleg. dr.iv. Vin. antimon. tartariz. gtt. v. Tinct. digit. gtt. v. Syrup. drachmam. M. fiat haust. tert. quaq. hora. sumend., preceded by this purgative powder, R. Hydrargyr. submuriat. gr. ii. Pulv. scammon. gr. iv. Sacch. purific. gr. ii. M. f. pulv. alterna noct. sumend.

The exhibition of calomel in small, but frequently repeated doses (as from one to five grains every two hours) has been strongly recommended by some practitioners, even from the commencement of the disease; but my own experience would incline me to say, that the advantages of this practice have been rated much too highly.* The propriety of applying large blis-

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has been sufficiently depleted, transfer the action to the surface. When the fits of coughing become more frequent, constant, audible, and stertorous; the the anxiety greater, the voice more shrill, and the pulse flagging and irregular, with red cheeks, heat of skin, restlessness, and the breathing oppressed and difficult, the patient is in an unfavourable state; As the disease sometimes terminates in twenty-four hours and is more particularly dangerous as the patient is younger, any exacerbations of the symptoms should be watched. C.

* This plan was recommended by Dr. Hamilton of Edinburgh along with the warm bath heated to ninety-six degrees: He succeeded in every case if it was given before the lips became livid; gradually increasing the intervals of the dose of the medicine, as the symptoms grew better. He relied principally on this mode to the exclusion of bleeding, a practice which will, we think, find few advocates: Calomel is no doubt a valuable purgative and should be freely used in this disease, but other remedies must assist: as it runs its course rapidly, salivation must not be relied on as important to the cure.

It is usually prescribed in doses so insignificant that the practice is rather calculated to injure the reputation of the medicine than to cure the patient. Every physician who is much conversant with this disease, and has accurately weighed the merits of the several means employed, will admit, that if we were restricted to a single remedy he would accept the calomel. But there is no occasion for relying on emetics, blood-letting, or mercury alone. By a judicious combination of calomel and the tartrite of antimony and potash, any case of croup, in its early stage, can be cured, (unless in its highest degree of inflammation, or where the muscles are the principal seat of the disease.) The quantity of this mixture cannot be well ascertained; but should always be given once in a quarter or half an hour, till the pulse shall have been nearly imperceptible. Calomel alone will generally succeed, but there are very few who will venture to give one or two hundred grains in a single night, which is often indispensable, and can scarcely fail to accomplish all we could desire. The apprehension of a severe ptyalism, deters many from employing this safe and incomparable remedy, although it is almost always groundless. We have never seen but one instance of salivation by calomel, in croup, out of several hundred. In the turgid state of the stomach it is beyond all other medicines effectual in accumulating the diminished excitability, which seems soon to pervade the whole sentient system. In large doses it does not act frequently as a cathartic; but finally very copiously, and in case of constipation an enema gives vent to the contents of the stomach and intestines, and almost always completes the cure.

The use of the corrosive muriate of mercury in this disease, as an emetic, has been considered problematical by some and hazardous by others. Experience will always determine in its favour, under the circumstances to which

ters to the throat, has also appeared to me very questionable. Experience, as well as theory, induce me to think, that the irritation produced by blisters may sometimes extend to the inflamed membrane, and aggravate the symptoms of the disease. The warm bath frequently affords great relief to the breathing, and may be directed at night, or even twice during the day. When the measures of depletion have been carried as far as the strength of the constitution admits, recourse must be had to such medicines as allay irritation and promote expectoration. The tincture of digitalis may be exhibited in small doses; and to the draught containing it may be added a proportion of oxymel of squills, and of the compound tincture of camphor; R. Mistur. camphor. ʒiv. Tinct. digit. gtt. x. Oxymel. squill. ʒss. Tinct. camphor. compos. gtt. x. M. f. haust. tert. hor. sumend. Laudanum, or the spt. æther. sulphur. may be substituted.

The decoction of the senega snake root, in the dose of a tea spoonful every half hour; gum ammoniac; the syrup of onions; antimonial wine and laudanum, and assafœtida, are highly valuable as expectorants in the last stage of this disease. Bleeding, purging, which relax and debilitate, are then improper. In this stage, sometimes the membrane is thrown off by coughing; and in the observation of Dr. Home it has succeeded completely in discharging it in two cases: Dr. Francis of New York has relieved several cases in which the patient was in articulo mortis by emetics of blue vitriol. They were given so strong as to excite complete vomiting with the happiest effect: strong decoctions of polygala senega are also recommended for the same purpose. R. Pulv. Seneg. ʒvi. Aq. Fluvial. ℔ss. Boil it to one half, and give a tea-spoonful every fifteen minutes, until it vomits.

Michaelis relates a case in which death took place after the membrane was twice discharged by emetics, and also one of successful termination by the same means. C.

The operation of bronchotomy has been suggested, but in croup I believe it to be altogether inadmissible.*

The complaint which I have described under the title of *spasmodic croup* is one of comparatively little danger, and will generally be found to yield to a gentle emetic, followed by a dose of calomel and rhubarb. It certainly is dependent in many in-

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its use should be restricted. In that insensible state of the stomach which is so often to be observed, where the excited fluid impedes the passage of air into the lungs, the sublimate affords a prompt, safe, and efficacious emetic, and has in our own hands arrested the progress of the patient to the grave, even while he had reached the confines of eternity. One grain dissolved in an ounce of water is usually sufficiently strong, if a tea spoonful be given every fifteen or twenty minutes till a complete emesis shall have been effected. It often excites a soreness in the gums, but scarcely ever a profuse salivation. P.

* And for this reason, that the membrane, which is generally the cause of death, extends into the ramifications of the trachea and the air cells of the lungs, and produces death by obstructing the passage of the air into them. The mere opening of the trachea would therefore be of no use, as the air passages would still be obstructed: Three cases however of its success are recorded; in these mucus appeared to be the cause of the obstruction.

stances upon a disordered condition of the primæ viæ. In urgent cases, threatening fits, leeches should be applied to the temples. When the croupy inspiration recurs at intervals for a considerable length of time, assafœtida may be given with advantage. During the period of dentition, the free scarification of the gums should never be omitted.

BRONCHIAL POLYPUS.

There is a very rare disease affecting adults, called *bronchial polypus*, which is believed to be dependent upon chronic inflammation of the mucous membrane of the windpipe and bronchia. It is characterised by catarrhal symptoms, wheezing, and the expectoration of portions of a membrane which must evidently have lined those parts. Such *polypi*, as they have been called, are sometimes solid, but more commonly tabular. The fit of coughing which displaces them is often alarmingly violent. The disease has been known to last many years.*

* The writers on it are Dr. Warren, in Coll. Trans. vol. i. p. 407; and Dr. Cheyne, in Edinburgh Med. and Surg. Journal, vol. iv. p. 441.

CHAPTER X.

PNEUMONIA.

Of Thoracic Inflammation generally.—Symptoms of Pleurisy.—Of Acute Bronchitis.—Of Peripneumony.—Duration of Pneumonia.—Prognosis.—Terminations of Pneumonia.—Mucous Expectoration.—Effusion of Serum.—Vomica and Empyema.—Hepatization of Lung.—Predisposing and exciting Causes.—General plan of Treatment in Pneumonia.—Venesection.—Purgatives.—Refrigerants.—Expectorants.—Blisters.—Treatment during the State of Suppuration.

OF THORACIC INFLAMMATION GENERALLY.

Acute inflammation occurring in any of the structures within the thorax, is what is understood by the term *Pneumonia*, the different species of which, as detailed by nosologists, have always had a reference to the particular structures which are the seat of disease. The principal of these are the pleaura, the mucous membrane of the bronchia, and that continuation of it which lines the air-cells of the lungs, the proper cellular structure of the lungs, and the pericardium. In the present chapter I shall confine my attention to the acute inflammation of the three first of these textures, and shall subsequently treat of the sub-acute and chronic forms of bronchial inflammation, of phthisis pulmonalis, or chronic inflammation of the substance of the lungs, and of the acute and chronic pericarditis.

SYMPTOMS OF PLEURISY.

Thoracic inflammation, in all its various forms, is characterised by the combination of the four following symptoms,—fever, pain of the side, difficult breathing, and cough; which constitute, therefore, the definition of pneumonia. But each of these symptoms is variously modified by circumstances; of which the most important is the structure, primarily or most essentially implicated. The pleura being that, the inflammation of which exhibits most perfectly the characters of the genus, I begin by describing the symptoms of *pleurisy*.

1. An acute pain of the side, highly aggravated on full inspiration, is the leading characteristic of this disease.

The pain varies very much in degree, from anxiety or the entire absence of all uneasiness to a pain of the most exquisite kind. When the disease is attended with no pain the general fever indicates it sufficiently; or it is sometimes felt when any effort is made, as on coughing; sometimes not under any circumstances; the difficulty of breathing, cough, and expectoration then sufficiently indicate the existence of the disease. C.

The respiration is short and hurried, and is generally performed with most difficulty when lying on the side affected. A hard and short cough is almost always present; and, as it aggravates the pain, is stifled as much as possible by the patient. At first it is commonly *dry*, that is to say, without expectoration. The accompanying fever is urgent. The pulse is frequent, strong, and *hard*.

This is subject to considerable variety; in some cases, it is oppressed, and apparently weak, and rises on bleeding; this occurs in persons who are strong and healthy before they are attacked; in other cases, where the system is delicate, it sinks on bleeding: Zimmerman states that it is sometimes stronger on one side than upon the other, and Cleghorn that it is most obscure upon the side affected. C.

The tongue is loaded with a thick fur. Thirst, restlessness, a hot skin, and a scanty and high-coloured state of the urine may be noticed. The concurrence of these symptoms precludes all possibility of ambiguity as to the nature of the disease, or the requisite means of relief. When blood is drawn from the arm, it will be found *cupped* and buffy. In some cases, inflammatory action is confined, throughout the whole course of the disease, strictly to the pleura. In others it implicates, to a greater or less degree, the contiguous portions of the substance of the lungs.

ACUTE BRONCHITIS.

2. When the mucous membrane lining the larger branches of the bronchia is affected by acute inflammation, that is to say, in *acute bronchitis*, the following is the character of the symptoms. It may be right first to mention, that this form of thoracic inflammation is less frequent than the preceding, though on the whole more dangerous. The most urgent symptom is a sense of *tightness* or constriction about the chest, referred generally to the pit of the stomach, but sometimes very unequivocally to the precise seat of the disease. Respiration is hurried, and accompanied by a wheezing in the throat, although the thorax can perhaps be expanded to its full extent. There is cough, which from the first is attended with some degree of expectoration. The general febrile symptoms are very severe. The pulse is frequent, but it often wants that fulness and hardness which cha-

racterise pleurisy. Not unfrequently it is intermitting. There is always observable a remarkable expression of *anxiety* in the countenance, generally with paleness. The functions of the brain are here more disturbed than in the common cases of thoracic inflammation. In the progress of this disease, authors have noticed, that occasionally, at a particular period, the constitutional symptoms are suddenly converted from those of high inflammatory action into such as indicate extreme debility, or exhaustion.

PERIPNEUMONY.

3. The *substance* of the lungs is also the seat of acute inflammation, and the term *peripneumony* is usually applied to this form of thoracic inflammation. In some of these cases the inflammation occupies the ramifications of the *mucous* membrane, but the proper cellular texture of the lungs (or parenchyma) is probably in others the primary structure affected. The student however need not perplex himself by attempts to establish a diagnosis between peripneumony and acute bronchitis. It is rather in deference to commonly received opinion, than from a conviction of their real differences, that I am induced to treat of them separately.

The usual symptoms of peripneumony are, an obtuse pain, sometimes referred to the side, but more usually to the sternum or epigastrium, and occasionally to the back or shoulder; impeded breathing, which is often particularly difficult in the recumbent posture; a moist cough; and fever, the character of which, however, is subject to great variety. Sometimes there is so little constitutional disturbance, so little febrile oppression, that the disease makes rapid advances before its nature is suspected. Sometimes the pulse is hard, but much more commonly it is oppressed, labouring, and full. Peripneumony is often attended by a puffiness of the features, lividity of the lips and under the eyes, eruptions about the lips, and occasionally headache; symptoms obviously referable to the difficulty experienced in the transmission of blood through the lungs.

It is certainly of importance to be aware of the minute difference in the *symptoms* of pneumonic inflammation; but to detail them would serve only to distract the attention from those great features of it now enumerated, which the student should keep steadily in view. The variety in the *progress* of the disease demands a more extended notice. The insidious manner in which it sometimes makes its approach, is the first point which should be urged, so directly opposed as it is to the *sudden* attack experienced in other cases. It is well worthy of remark, that a degree of inflammatory action may, and often does exist in the

lungs for many weeks, without producing any serious disorganization in their structure. At other times, the continuance of inflammation, even for a few days, lays the foundation of extensive and irremediable mischief.

PROGNOSIS.

Notwithstanding, however, the importance of the organ attacked, the prognosis in pneumonia is not unfavourable. There is no form of inflammatory affection which is so completely under the control of the physician as this. Resolution, therefore, is its most frequent termination; but it is to be observed, that in all the forms of bronchial inflammation, and in a large proportion also of the most genuine cases of pleurisy, the subsidence of inflammation is attended by an increased secretion from the mucous membrane of the bronchia.

TERMINATIONS OF PNEUMONIA.

1. This important principle points out the necessity of attending accurately, during the whole course of the disease, to the *state of the expectoration;* by which, no less than by the variations in the four leading symptoms already stated, is the progress of the inflammation to be judged of, and the treatment regulated. A copious and easy expectoration of mucus marks the decline of the disease. Nor is the prognosis less favourable if the sputa be tinged with blood.* A cream-like deposition in the urine, and a copious warm perspiration, are equally evidences of the subsi-

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* The greater the relief afforded by the expectoration, the more favourable is the case; If it fails in the course of the disease, and brings little relief, and more particularly if it has been scanty or absent from the beginning, suppuration or gangrene must be dreaded; Suppuration is indicated when the expectoration fails in the progress of the disease, and gangrene when the matter is livid or sanious.* C.

Expectoration is not one of the necessary accompaniments of pneumonia. In a high state of inflammation of the lungs it can, and ought always to be prevented by early and profuse evacuations of the blood. It cannot exist, in the first stage of pneumonia, in any great degree. In the second stage, it is diminished by the same means. In a weakened action of the heart the secretion is often insufficient to relieve the vessels, and may require artificial excitement to exonerate them. When during the inflammation the expectoration is sparingly exerted, blood-letting promotes the secretion, by lowering the tone of the arteries which depend upon the heart for their action. There is a diminished susceptibility in the nerves of the lungs and bronchia, in the low stage of pneumonia, sometimes succeeding to acute inflammation, at others where the disease has been chronic from the beginning. This condition requires the use of such agents as are most likely to exert an influence on these parts; squills, seneca, and the balsams have all been employed with good effect, under such a state; but are not comparable to mercury. Blisters will, in some systems, answer our purpose, as long as they continue to stimulate. P.

* Philip on Feb. Dis. p. 232–3. Lond. 1813.

dence of inflammatory action. Under certain circumstances, however, the secretion from the mucous membrane of the bronchia may be so profuse, as to exhaust the patient by the quantity of the discharge, or by the necessary efforts for its expulsion.

SEROUS EFFUSION.

2. Allied, in some degree, to the termination by mucous expectoration, is that by *serous* effusion into the air-cells. So far, at least, it is allied, that we presume this effusion takes place from the vessels of the inflamed membrane; but in a practical point of view, they differ most essentially. Mucous expectoration is always desirable. Serous effusion is almost uniformly fatal. The effused fluid is *serum*, or, more strictly, water; and it takes place, not so much when the disease has a tendency to *resolve*, as during the height of inflammatory action. It has been supposed that the disposition to *serous effusion* is sometimes given, or increased, by the too liberal employment of the lancet in the prior stages of the disease; but I have more commonly found it to occur where no treatment whatever had been adopted. The rapidity with which it takes place is a circumstance deserving of notice. The symptoms which attend it are, a livid appearance of the whole countenance, and a sudden sinking of the pulse, with urgent dyspnœa. It is, I believe, peculiar to peripneumony, and those diseases which have supervening peripneumony, and it proves fatal by suffocation.

VOMICA AND EMPYEMA.

3. Every form of pneumonia occasionally terminates by suppuration, which may be either diffused or circumscribed. When the disease is violent, the constitution much enfeebled, and the pleura the chief seat of disorder, pus is frequently thrown out by the inflamed membrane without ulceration, and is found after death floating loose in the cavity of the thorax, constituting *empyema*. Acute bronchitis in like manner sometimes terminates by a profuse secretion of true purulent matter from the vessels of the inflamed membrane. These states of disease are usually fatal. Pleurisy and peripneumony on the other hand occasionally terminate by the formation of one or more abscesses, which in this situation are called *vomicæ*. The symptoms of vomica are, a frequent and full pulse, the continuance of dyspnœa, a sensation of weight, or fullness, in a particular part of the chest, and, after a certain time (three weeks or a month) hectic fever, and purulent expectoration.

The cough is often obstinate and dry, the breathing is difficult, more frequent, short and rattling, the patient is able to lie only on the side affected;

the difficulty of breathing is increased by eating and by exercise, sweats occur particularly towards morning and about the throat and forehead; many of these symptoms, however, take place from other causes; even the shivering is sometimes absent:

The pulse as soon as suppuration takes place loses its hardness, the fever still continuing: the period at which resolution takes place is various, even as late as four or five weeks.*

An abscess of the lungs may remain in a concealed state for many years, without even producing hectic fever; When it bursts into the lungs, it is immediately fatal, if the collection of matter be large; it may open into the cavity of the pleura, and thus may produce death; it is attended with the same symptoms as hydrothorax, difficulty of breathing on lying down, a weight in the lower part of the chest, &c., with those of hectic superadded: if the abscess be so large as to fill the whole thorax the intercostal muscles are protruded between the ribs, so as to be above their level, and the fluctuation of a fluid can often be felt in the chest on turning from side to side; If the quantity discharged is small an ulcer follows, and the patient dies of phthisis; it however in healthy habits sometimes gets well: Abscesses in the lungs also are absorbed, and the matter is discharged by urine or stool, or deposited on some other organ: It is said that generally they burst about the twentieth day of the disease. C.

The danger attending vomica will be proportioned to the strength of the constitution and the size of the abscess. In a strong habit of body even a large vomica will occasionally heal, but in a debilitated subject no reasonable hope of recovery can be entertained. The matter expectorated is often exceedingly fœtid, a circumstance which will assist in the diagnosis of simple vomica from tubercular consumption.

GANGRENE.

Gangrene (or rather sloughy abscess) of the lungs has been described by Laennec, and others. The occurrence is rare, and never very distinctly characterized during life.

Laennec states, that when it occurs in the pleura, it is generally the consequence of the bursting of an abscess of the lungs into the pleura, and it occurs occasionally after chronic inflammation of the chest: the lungs slough in small patches, of a blackish or greenish colour, of a round or irregular figure, affecting the pleura, the intercostal muscles, and even the ribs; as soon as gangrene takes place the pleura inflames extensively, there is a copious effusion of fluids into its cavity, affecting the false membranes the product of inflammation: Sometimes abscesses open externally through the intercostals without gangrene taking place, discharging the matter and healing up the wound; more frequently, however, an incurable fistula is the result.

The difficulty of distinguishing when gangrene of the lungs takes place, arises from the circumstance, that soon after the gangrene appears a serous effusion soon succeeds, which destroys its character, and the patient is suffocated: The diminution of the pain, the sinking of the pulse, and the ichorous expectoration, are all evidences of the disposition to gangrene; the pulse becomes feeble, intermitting and irregular; hiccup, stupor, and loss of sight succeed,

* Philip, vol. ii. p. 238.

and death soon takes place: Inflammation of the lungs often terminates in schirrus; this change is said to be indicated by a troublesome dry cough, remaining after the symptoms are gone, and which is much increased by exercise after a full meal; the absence of hectic fever distinguishes it from vomica, and the stationary character of the symptoms, which in vomica continually increase. Sometimes debility only remains after the disease of the lungs; this takes place in nervous and irritable habits; it is known by difficulty of breathing and oppression.*

The inflammation of the pleura is also connected with an accumulation of air in the thorax; it is the effect either of the decomposition of the pus effused by the inflamed surface, or it is thrown out of the air cells through the ulcerations of the lung itself: it always takes place in gangrene of the lungs, on the decomposition of blood effused into the cavity of the pleura, or it may arise from a rupture of the lungs by external violence. C.

ADHESIONS.

4. Pleurisy is frequently followed by *adhesions* of the opposite surfaces of the pleura to each other. It is remarkable, that this takes place without being productive, as far as can be judged, of any particular inconvenience to the breathing. In some cases serum is effused with or without coagulable lymph, and the result is *hydrothorax.*

HEPATIZATION.

5. Coagulable lymph is sometimes thrown out by the vessels of the proper cellular texture of the lungs, giving rise to what has been called *hepatization*, or hardening of the lungs, a state in which they are impervious to air, and of course incapable of performing their functions. The state of condensed or hepatized lung is not uncommon. When simple, that is, uncombined with tubercle, it principally occurs in persons of strong fibre and plethoric habit, giving rise to the following combination of symptoms:—difficult breathing, cough, giddiness, and permanently loaded tongue, without emaciation or œdema. It may continue for a considerable time. At length, however, acute inflammation supervenes, speedily proving fatal; or the symptoms gradually merge in those of common consumption. Polypous concretions in the heart and great blood-vessels are usually met with in persons thus carried off, making the *entonic* character of the preceding inflammation.

6. It remains to be noticed, that occasionally, and more especially in the peripneumony of children, no morbid appearance is discoverable after death, except perhaps a slight engorgement of a portion of the lungs with blood. This renders it probable, that, independent of effusion and consequent suffocation, pneumonia may prove fatal through the mere violence of inflammatory action. This principle in pathology will hereafter be more fully illustrated.

* Philip, p. 240.

Pneumonia often terminates by a free and copious perspiration; if, however, it brings no relief, it is regarded as unfavorable: Evacuations of blood from the rectum, and also from the nose, are attended with recovery: High coloured and turbid urine often is a sign of a favourable termination. Eruptions behind the ears; suppuration of the parotids; erysipelas on the skin, also are favourable; The discharge from the nose and fauces is unfavorable according to Huxham: Sometimes the disease is translated to the liver and spleen with dangerous results. The prognosis in pleurisy is drawn from the intensity of the symptoms.

Considerable danger is indicated by a violent fever, by great difficulty of breathing, by the power of lying only on one side; a higher degree, by being able to lie on the back only; a still higher degree by the sitting posture only being possible, attended in this position with great turgescence and flushing of the face, partial sweats about the head and neck, and an irregular pulse; The pain acute or very obtuse, attended at the same time with interrupted or difficult respiration, also becoming extensive and spreading from one side into the other, delirium, a dark coloured expectoration, livid countenance, sinking and irregular pulse, are always dangerous symptoms.*

If after the fever and inflammation run high the pain should cease suddenly, danger may be anticipated. Abatement of the fever, heat, pain, the expectoration becoming free and copious, are favourable signs. Hemorrhage from the nose, diarrhœa, free diaphoresis, copious flow of urine, are also favourable.

STETHOSCOPE.

In order to ascertain exactly the state of the lungs, Dr. Laennec has proposed the stethoscope, an instrument consisting of a cylindrical piece of wood a foot long, and about two inches in diameter, hollowed out lengthwise with a perforation of three lines in diameter, with one extremity made into a funnel one inch and a half in depth; When the state of the heart is to be explored, the funnel is filled up; the stethoscope is made into a tube of thick sides, by putting in a piece of wood to exactly fill up the cavity. It is placed on the breast, with the ear to one end, the other resting on the part to be explored. The trembling of the breast produced on singing, when the hand is applied to the chest, does not take place when any part of the lungs has become impermeable to the air, or when a fluid is effused between the lungs and the thorax; the stethoscope applied over the parts will then point out these defects: its use is, however, limited in those cases by the circumstances, that fatness, infiltration under the integuments of the thorax prevent exact precision in the diagnosis.

Martinet has well described the use of this instrument and the states of the lungs indicated by it, as follows:

OF THE PHENOMENA WHICH RESULT FROM THE ACT OF RESPIRATION.

"Inspiration and expiration are performed slowly and with ease, none of the muscles appearing to make any particular effort; they succeed each other regularly, their rythm is constant and uniform; all the ribs are alternately elevated and depressed, and the dilatation and contraction are equal at both sides, except in cases of deformity of the thorax. Respiration in children is performed in a great degree by the motion of the ribs alone; in adults, by that of the ribs and diaphragm; and by this last muscle alone, in old persons in whom the cartilages have become ossified.

The younger the subject is, the more frequent is the respiration. Thus, during the first year, an infant respires about thirty-five times in a minute, but an adult makes about eighteen or twenty respirations in the

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* Cullen, First Lines, art. Pneumonia.

same time. Its frequency is greater in women and persons of a nervous or irritable habit.

The movements of the chest present many varieties, which may be referred to the following heads: They may be frequent or unfrequent, quick or slow, regular or irregular, great or small, equal or unequal, easy or difficult, complete or incomplete; and, finally, the respiration may be abdominal or thoracic. All these phenomena are within the reach of the ordinary means of examination; but auscultation conducts us to the knowledge of others, which we now proceed to detail.

Auscultation may be made either by applying the ear to the walls of the thorax, or by means of the stethoscope invented by Laennec.

Immediate auscultation is more particularly useful to persons who have not acquired much experience in this mode of examination; for when the phenomena have been rendered sensible by the application of the ear, and the observer has formed some idea of them, it becomes more easy for him to seize their minute shades, than if he had commenced in the first instance by employing the stethoscope. However, it should be remembered that there are cases in which the use of the instrument is altogether indispensable, where, in fact, the ear cannot be applied; for instance, immediately above and below the cavicle, in the hollow of the axilla, and beneath the mammæ in females. Besides, the head can scarcely follow the movements of the chest, as it is elevated and depressed; and even if it could, the friction it produces must render the sound somewhat confused.

When using the stethoscope, it should be held like a writing pen, the fingers being so placed on the instrument, as to feel at once its extremity and the point of the thorax to which it is to be applied. It should be also placed evenly upon the surface, and perpendicular to it.

Before we begin the examination, or at all events before we note its results, we should wait until any impression this process may have made on the patient shall have passed away; for if this precaution be necessary in examining the state of the circulation by means of the pulse, it is no less so when investigating the respiration by the stethoscope. The phenomena which exist in the healthy state of the organs should first be studied, in order that they be not confounded with those which are produced by disease; and that their various changes may be accurately estimated, or their absence determined, which is by no means an unusual occurrence.

When examining the respiration, the funnel should be removed from the end of the cylinder. On applying its extremity to the chest, we perceive in a healthy adult, during inspiration and expiration, a slight, though distinct murmur, marking the entrance of the air into the cells, and its passage out of them. This murmur is loud in proportion to the depth and frequency of the respiration—to the youth of the subject, to the thinness of the walls of the thorax, and completeness of their dilatation. In females it is more strongly marked than in males, and still more so in children, whence the term "*puerile*" is applied to respiration when it becomes very sonorous.

The respiratory murmur is most perceptible in the hollow of the axilla, in the space between the anterior border of the trapezius muscle and the clavicle, immediately beneath this bone, and at the inferior and posterior part of the chest; for these are the parts in which the lungs are nearest to the surface. Opposite the trachea, larynx and root of the bronchi, the sound of the respiration is much more loud and distinct; it is not unlike that of a bellows, and gives the idea of a considerable column of air passing through a tube of large diameter; the air also appears as if sucked in from the cylinder, during inspiration, and expelled again

during expiration. To this peculiar sound the term "*tracheal* respiration" is applied.

The respiratory murmur may be stronger or weaker than natural, may be altogether suppressed or heightened, so as to resemble what we have described as the "*tracheal*" respiration; and, lastly, it may be pure, or mixed with some of those various sounds, to which the term "*râle*" has been applied.

When the respiration becomes more strong than natural, it assumes the character it manifests in children, and therefore is termed by Laennec "*puerile respiration.*" This intensity of sound is not owing to a lesion of the part of the lung in which it is heard; on the contrary, it is heard only in the healthy parts, whose action becomes momentarily increased to supply that of the diseased parts. Thus, in pneumonia, we usually find the "puerile" respiration, in those portions of the lung which are not yet attacked by the inflammation.

As the respiratory murmur presents a number of varieties even in the healthy state, it is only by comparing different parts of the lungs that we can judge of any diminution of its intensity that may occur. It is always easy to make this comparison; for the respiration is seldom weakened in the entire of the lung, or in both lungs at the same time. But its degrees vary from a slight weakening of its natural intensity to total suppression. A diminution of the movements of the thorax seems to be the most usual cause of this weakening of the respiratory murmur; it sometimes arises from a partial obstruction of the smaller bronchial tubes, either by a thickening of their mucous membrane, or by the presence of some viscid matter. It is also found to occur in cases in which false membranes are yet soft and just beginning to be organized.

Complete suppression of the respiratory murmur arises from various causes. It occurs when the lung becomes impermeable to the air, or when there is interposed between it and the walls of the thorax any liquid or gaseous exhalation, which prevents the sound from being transmitted. It seldom happens that the sound is suppressed through the whole extent of a side of the chest. Some trace of it can almost always be discovered near the clavicles, and opposite the root of the lung; and probably it is never altogether inaudible at the latter of these points.

When treating of the natural phenomena, we described the "*tracheal*" respiration, and indicated the points in which it is heard. It sometimes happens that a similar sound is emitted from other parts, besides those in which it is audible during health. This occurs either when there are cavities of a certain extent communicating freely with the bronchi: or when the tissue of the lung becomes indurated, and so transmits more readily the sounds which the air produces in passing through the large bronchial tubes. In the parts of the lung which remain unaffected, we find that the respiration has become "*puerile.*"

The respiratory murmur, whatever be its degree of intensity, may be pure, which indicates that the air tubes are free from obstruction; or it may be blended, and as it were disguised by other sounds, to which the term "*râle*" has been applied. By "*râle*" *or rattle, is understood any sound produced by the circulation of the air in the bronchi and air-vesicles, different from that murmur which it determines in the healthy state.*

The "râle" seldom occupies the entire extent of the lung; they are usually audible only in a certain part of it, the respiration remaining natural, or becoming "*puerile*" in the rest. They indicate either a contraction of some part of the bronchial tubes, or the presence of a fluid which obstructs them or the air vesicles. The "râles" are divided into four

species;—1st, the "râle muqueux;"—2d, "râle sonore;"—3d, "râle sibilant;"—4th, "râle crepitant."

The "*râle muqueux*," or mucous rattle, is produced by the passage of the air through sputa accumulated in the bronchi or trachea, or through softened tubercular matter. The character of the sound indicates that the fluid, which fills up the air-tubes, is unctuous but not tenacious. Sometimes it is weak and audible only from time to time, at others it is rather loud and continuous. In the former case the air meets only at intervals portions of mucus, which determine the sound; in the latter the bronchi are almost entirely filled with it. When carried to a very high degree, it constitutes a gurgling, or "*gargouillement*." This is the term that has been applied to the loud murmur, which is produced by the agitation of the matter of tubercles, or puriform sputa, by the passage of air through them. This "râle" occurs in catarrh and in softened tubercle.

The "*râle sonore*," consists of a sound more or less grave, and occasionally very loud, resembling sometimes the snoring of a person asleep, at others the sound of the bass string of an instrument when rubbed by the finger, and not unfrequently the cooing of a dove. It seems to be caused by a contraction of the bronchial tubes, by a thickening of their mucous membrane, or by some change in the form of these canals, induced probably by the thickening of the spur-like processes or folds of membrane at the points of division of the bronchi; at least this change is almost constantly observable in subjects that have died during the existence of chronic catarrh, of which this "rale" is characteristic.

The "*râle sibilant*," consists of a slight, though prolonged, hissing sound, which occurs either at the termination or commencement of inspiration. It may be grave or acute, dull or sonorous. These two varieties may exist at the same time in different parts of the lung, or may succeed each other at variable intervals, in the same part. It is owing to the presence of mucus, thin, and viscid, but not abundant, which obstructs, more or less completely, the smaller bronchial ramifications, which the air has to pass through before it arives at the air-cells. This "râle" seems to indicate a more serious affection of the lungs than the one last described, inasmuch as it is seated in the more minute bronchial ramifications; hence, when it extends to any considerable portion of the lung, it is attended by great difficulty of respiration. It is during the existence of this "râle" that the sputa present that arborescent appearance, which resembles so much the form, dimensions, and ramifications of the small bronchial tubes, from which they have been expelled by the efforts of coughing. It occurs in the first stage of bronchitis.

The "*râle crepitant*" resembles very accurately the crackling or crepitation of salt, when thrown into a heated vessel, or that emitted by a piece of dried lung, when pressed between the fingers. It depends on an exhalation of blood on the internal surface of the air-cells, such as occurs in the first stage of pneumonia, of which this "rale" is the distinctive sign. It occurs also in hæmoptysis and œdema of the lungs.

These are the different "râles" which the stethoscope enables us to recognize. It would appear from this description of them, that their characters are so strongly marked, that they cannot be confounded or mistaken one for the other; but still it frequently happens that their differences are not so striking, and that they glide into each other, by a sort of transition indicative of a mixed lesion, or one more nearly allied to one than the other. It is by habit and practice alone that we can learn to appreciate these shades; words cannot convey an adequate idea of them.

OF THE PHENOMENA WHICH DEPEND ON THE VOICE.

When examining the voice, the funnel should be retained in the extremity of the cylinder, and then the phenomena will be found to vary; 1st, according to the points at which they are examined; and, 2d, according to the natural character of the voice.

When a person speaks or sings, his voice thrills in the interior of the chest, and produces in its whole extent a trembling motion, which we can readily perceive on the application of the hand. This phenomenon is not of much importance, and seldom demands any particular attention. However, when a large cavity happens to exist, the trembling becomes so forcible, as of itself to make us suspect its existence. When the cylinder is applied to the thorax, we hear a confused resonance of the voice, the intensity of which varies in different points of its extent. It is most distinctly heard in the arm-pit, at the back, between the internal border of the scapula and the vertebral column, and anteriorly at the angle formed by the clavicle with the sternum. We do not hear any thing distinct or articulate, it is rather a sound more or less confused, which seems to waste itself against the walls of the thorax. In other parts of the chest, particularly posteriorly and inferiorly, the sound is much more weak, and produces only an indistinct murmur. It is in all cases rendered more manifest where old adhesions exist.

In persons whose voice is deep and grave, the degree of resonance is greater, but it is confused, and nearly equal at all points of the thorax; but in females and children, whose voice is acute, it is clear and distinct.

In disease, the phenomena furnished by the voice are referable to three heads: Resonance, Pectoriloquy, and Ægophony. By the term resonance, is understood a thrilling of the voice more loud than is natural, or its existence in a part in which it is not heard during health. It sometimes becomes so strong as that the sound seems to be produced at the very extremity of the cylinder which is placed on the thorax, but it never conveys the impression as if it traversed the length of the tube to reach the ear of the observer. A thickened and hardened state of the lung, caused either by a mass of crude tubercles, or by inflammation, produces this phenomenon, by rendering the lung a better conductor of the murmur of the voice in the bronchi. Hence the origin of the term "*broncophony.*" This symptom, though not usually of much importance, becomes occasionally of considerable value, when it co-exists with phenomena furnished by other means of examination, and also as enabling us to make a comparison between the state of the two sides of the thorax.

This phenomenon is said to exist when the voice of the patient, distinctly articulated, seems to issue from the point of the chest on which the cylinder is applied, and traverses its whole length to strike the ear of the observer, with its natural tone, or probably more strongly. These are the circumstances which constitute *perfect* pectoriloquy; but it admits of two other degrees, namely, the *imperfect* and the *doubtful.* It is termed *imperfect,* when the voice thrills strongly under the cylinder, seems to approach the ear, but never traverses the whole length of the tube. And, lastly, it is said to be *doubtful,* when the voice seems acute and suppressed like that of a ventriloquist, and is arrested at the thoracic extremity of the tube, thus approaching to the character of simple resonance.

Pectoriloquy presents some varieties, which depend on the tone of the voice, the size and form of the excavations, the firmness of their walls,

the degree of facility with which the air can penetrate them; and finally, the existence or non-existence of adhesions with the pleura costalis.

The more acute the voice is, the more evident does the pectoriloquy become; hence, in persons whose voice is grave and deep, the thrilling or vibration of the walls of the thorax may be sufficiently intense to mask it, and render it doubtful.

In cases of aphonia, the pectoriloquy is not entirely suppressed. It sometimes occurs that we can distinguish better what the patient endeavours to express, by placing the cylinder on the point corresponding to the excavation in the lung, than we can by the naked ear at the same distance.

The pectoriloquy is sensibly affected by the size of the cavities. Thus, when they are unusually large, it becomes changed into a very full and grave sound, similar to that of the voice transmitted to some distance through a tube, or cone of paper. In very small cavities, on the contrary, it becomes doubtful, particularly when parts of the lung which surround them are still permeable to the air.

The more dense and firm the walls of the excavation are, the more perfect is the pectoriloquy. It sometimes acquires even a metallic tone when the cavity has become lined by a membrane, whose structure approaches that of fibro-cartilage.

It is also rendered very distinct when the cavity is superficial, and its walls thin, and adherent to the pleura costalis; but when there is no adhesion, and the sides of the cavity become compressed together during expiration, the pectoriloquy becomes doubtful; the existence of the excavation must then be ascertained by other symptoms.

Again, its force becomes increased, and the voice seems as if transmitted through a tube, when new cavities begin to communicate with those already existing; but if the excavations become very numerous and tortuous, the sound is rendered somewhat confused and indistinct.

The less liquid the cavity contains, the more evident is the pectoriloquy, for then the communication with the bronchi is usually open, and allows a free passage to the air.

If this communication be obstructed for any time by the accumulation of matter in the bronchi, the pectoriloquy is rendered doubtful, and acquires somewhat of an intermittent character.

It sometimes happens that we can find scarcely a single individual with pectoriloquy in the wards of a hospital, though at the previous visit there had been several; in such cases, we observe that in the greater number of the patients, the expectoration had been very much diminished or altogether suppressed.

Ægophony consists of a strong resonance of the voice, which is more acute and sharp than that of the patient, but never seems to traverse the cylinder as pectoriloquy does; its tone is thrilling and tremulous, like that of a goat; whence the term is derived.

Though its limits are usually circumscribed, they are not so much so as those of pectoriloquy; it is found between the base of the scapula and vertebral column, towards the inferior angle and external border of that bone, and sometimes in the direction of a line, which may be conceived to pass from its centre to the sternum, following the direction of the ribs. When ægophony exists at both sides at the same time, it is difficult to determine whether it is produced by disease; for in some persons the natural resonance of the voice presents this acute and tremulous character at the root of the lungs. If old adhesions exist at one side of the chest, the ægophony becomes much more evident.

Ægophony, though it may vary in force and extent, always indicates the existence, in the cavity of the pleura, of a moderate quantity of fluid,

or of false membranes, somewhat thick and soft; it ceases when the effusion becomes too considerable: hence, in the former case it indicates pleurisy in its first stage; and in the latter, it marks its passage to the chronic state, if the general symptoms still continue after the cessation of the ægophony; but it is not a sign of its resolution, if these symptoms cease as it disappears.

Ægophony does not prevent us altogether from hearing the respiratory murmur, when it is not suppressed by hepatization of the lung.

The *Metallic Tingling*, *Respiration*, and *Resonance* are very remarkable phenomena, with which we shall conclude this account of the signs furnished by the voice and respiration.

The metallic tingling, or "tintement metallique," resembles the sound produced by any very small hard body striking against a metallic or glass cup. When the phenomenon is not so strongly marked, it produces only the *metallic resonance;* lastly, the respiration also may assume this character, in which case it resembles the murmur produced by air blown into a metallic vessel with a narrow aperture; these different sounds cease occasionally for a short time, but recur soon after.

The metallic tingling occurs when there exists a large excavation filled with air and fluid, communicating with the bronchi, and is heard when the patient coughs or speaks.

The metallic respiration occurs when there is a fistulous communication between the bronchi and the cavity of the pleura.

The metallic resonance and respiration indicate, in addition to the fistulous communication between the bronchi and pleura, an effusion of gaseous fluid into the cavity of that membrane.

When the metallic tingling occurs together with the metallic resonance and respiration, it denotes the existence of a vast excavation, whose walls are thin, adherent and compact.

OF PERCUSSION.

The value of percussion, as a mode of examination, has not been by any means diminished by the discovery of auscultation. It is still considered a very efficient means of distinguishing diseases of the chest. Though it appears to be a very simple operation, it requires some precautions in performing it, so as to obtain satisfactory results. The fingers should be semi-flexed, their extremities placed closely together, and so adjusted as to be on the same plane, none of them passing beyond the others. In this way they are made to strike the chest perpendicularly, the integuments being made tense by the fingers of the other hand. The percussion should be made alternately on the corresponding points of each side of the chest, with the same degree of force and same angle of incidence. The wrist should be free and unrestrained, so as not to strike too forcibly and cause pain. Percussion may occasionally be made, by striking the walls of the thorax with the hand flat and extended; but in this case allowance must be made for the sound emitted by the skin.

The position of the patient should also be properly adjusted. He should be made to sit upright, his arms being carried backwards when the anterior part of the chest is to be examined; elevated towards his head, when percussion is being made on the lateral parts, or crossed in front, whilst we strike the back. He should at the same time be directed to bend forwards, so as to give the back an arched position. These several measures are intended for the purpose of rendering tense the muscles which cover the walls of the thorax.

The condition of the external parts should be attended to; thus the sound will be more clear when the patient is thin and his fibres dry, than

when he happens to be very fat, or when the flesh is soft and flaccid; but if the integuments be infiltrated by a serous effusion, no sound will be emitted on percussion.

The sound is more clear when we make percussion on those parts that are covered merely by the skin, or by thin and tense muscles; for instance, on the clavicles, or immediately below them to the distance of two fingers' breadth on the sternum;—towards the cartilages of the ribs, within the margins of the axilla as far as the third rib; and posteriorly on the angles of those bones;—on the spine of the scapula, and, in thin subjects, on its supra and infra spinous fossæ.

The sound must obviously be dull at the region of the heart, opposite the mammæ in females, and great pectoral muscle in males; and also inferiorly at the right side, in consequence of the position of the liver; at the left side, on the contrary, the sound is rendered more clear by its vicinity to the stomach, particularly if that viscus be distended by flatus.

The sound emitted by the chest, frequently becomes altered, being rendered dull, obscure, or even totally suppressed; or, on the contrary, may become more clear than in the natural state; so much so, as in some instances to give rise to a gurgling, or even a metallic tingling. When this phenomenon occurs, it is observed most usually beneath the clavicles. This exaltation of sound occurs when the lungs contain a greater quantity of air than is natural, or when this fluid is effused into the cavity of the pleura.

When the elasticity of the lung is diminished by its becoming infiltrated, without at the same time losing altogether its permeability to the air, the sound is rendered dull or obscure, according to the degree in which the pulmonary tissue is affected. This change takes place in cases of intense catarrh, in the first degree of pneumonia, and in œdema of the lungs.

The sound is suppressed altogether in the second degree of pneumonia, when the substance of the lung becomes dense and heavy like that of the liver, and so is rendered impermeable to the air. The same effect is produced when the lung is compressed by a fluid effused into the cavity of the pleura, or by the developement of any accidental production in its surface. This suppression is, however, but partial in most cases. Its extent depends on that of the effusion, hepatization, or tumour with which it is connected, the remainder of the side still emitting its natural sound on percussion.

When the lung contains an unusual quantity of air, or when an elastic fluid is effused into the pleura, the sound becomes more clear than natural. And lastly, its tone may be increased so as to resemble a metallic tingling, in cases of pulmonary excavations, or pleuritic abscess, which are circumscribed and filled partly with air, partly with fluid." *

CAUSES.

Pneumonia is, perhaps, the only inflammatory affection which occurs with equal frequency at every period of life, and under every variety of habit, circumstance, and situation. Its most common exciting cause is cold, and alterations of atmospheric temperature. It often supervenes on other diseases; such as measles, small-pox, catarrh, hooping cough, and occasionally rheumatism and gout. The disposition to pneumonia is much increas-

* Martinet, quoted in Robertson.

ed by long-continued exercise of the lungs in speaking, by severe exercise of the body generally, and by its having before occurred. It is a frequent effect of that habitual indulgence in spirituous liquors, so common in the lower orders of this country. It prevails chiefly in the winter and spring seasons, like every other form of thoracic disease.

Pringle and others observed, that pneumonia prevails in all extremes of weather, both when it is very cold, warm, dry, and moist; it is, however, more common in this climate in winter; the coldness and dryness of the air has an effect in determining its character; thus, Huxham observes that in low and moist situations, an epidemic pneumonia takes the form of catarrh, whilst in higher and drier places, it becomes pneumonia or pleurisy: Strength of constitution also renders a person more liable to it; it therefore most commonly attacks the middle-aged, and those who are robust and accustomed to strong exercise; in these cases, however, a person must be exposed to some sudden change of air, by which the disease is induced: Another class of persons are also very subject to it; those who sit much in an unfavourable posture, and in heated rooms, as, taylors, mantua makers, &c.; their pleurisies are more unmanageable, and their catarrhs are more violent: That it is much influenced in its intensity by the strength, is evident from the fact, that women are less subject to pleurisy than men, and also that the disease is less violent in them.

Any cause which determines the blood particularly to the lungs will produce pleurisy; thus acrid metallic vapours or gasses, long continued coughing, as in asthma, hydrothorax, callosity of the pleura, adhesions of that membrane to the sides.

Hoffman relates cases, in which it occurred in the same individual four or five times a year; like most other inflammations, it is not contagious, except in the low or typhoid form.*

TREATMENT.

The principles of treatment in pneumonia are sufficiently simple; but the *extent* to which evacuation should be carried, having a due regard to the period of the disease, the nature of the prevailing epidemic, the age and circumstances of the patient, and the urgency of the symptoms, must be regulated by a habit of discrimination, that can be acquired only by clinical observation. In the acquisition of this knowledge, so essential to the safety of the patient, the student may perhaps be assisted by a few considerations which it shall be my object now to lay before him.

VENESECTION.

1. In bleeding from the arm we possess a power of controlling pneumonic inflammation, the efficacy of which has been acknowledged in all ages, and is obvious, indeed, to the most superficial observer; nor is it difficult to account for this, when we reflect that the morbid action occupies the branches of the pulmonary artery, with which the veins of the body generally are physiologically associated. Beneficial as bleeding is, much must of course

* Philip, p. 265-6.

depend on the period of the disease at which it is first practised, on the manner in which it is performed, the quantity drawn, and the frequency of its repetition. Above all, in estimating the probable advantage of blood-letting in any particular case, the natural strength of the constitution is to be looked to. Weakly habits will not bear the extent of blood-letting which is necessary to subdue a severe attack. Old persons and infants have not the power of regenerating blood so quickly as adults. Physicians have been struck at all times, with the effect produced by taking the blood from a *large orifice*, in this and other urgent cases of local inflammation; and it certainly cannot be too strongly urged as an indispensable point in practice. The orifice should be such as to allow a pound of blood to flow in five, or at furthest in six minutes. The quantity to be taken at one time cannot be defined with any degree of accuracy. A pound of blood may be looked upon as a proper *average* for an adult. As a general rule it may be stated, that some effect ought to be produced on the *system*, before the orifice is closed; either faintishness, or sickness, or diminution of pain, or of the strength of arterial contraction.

Blood-letting is less effectual in inflammations of the lungs than in pleurisy, because the abstraction of a greater quantity is required to unload the small vessels; but in an equal degree of inflammation, we imagine the same quantity of blood may be drawn with equal propriety in either. In the most acute inflammation there is sometimes no secretion till after one or more blood-lettings. P.

As long as the pulse continues full and hard, the pain sharp, and respiration difficult and anxious, bleeding must be repeated; in general if the bleeding be copious, and a decided impression be made upon the system, this inflammation will be completely subdued, and without it, if neglected for three days, the disease must certainly terminate in death. The inhabitants of mountainous situations, and of the country, require more bleeding than those who live in cities, and whose habits are sedentary, and constitution delicate.

When the physician is not called till the fifth or sixth day, the pulse still full though not hard, the expectoration which from the first was mixed with blood, still purulent and brought up with difficulty, the pain in the breast still great and the breathing laborious, with a slight propensity to sweat, then a large bleeding is necessary; a small one will arrest the expectoration without any good effect, and on the contrary do great injury: A large bleeding in this case prevents gangrene. After the pulse is subdued by the bleeding, blisters may be used with the greatest success. If warm and stimulating drinks be given in this stage, with the view of exciting perspiration, the fever will become malignant, and mortification may take place.*

When the patient has taken stimulants imprudently, and no depleting measures have been used for five or six days, the expectoration being suppressed, the breathing laborious, the pulse quick, the eyes dull, the face sunk and ghastly, the skin cold and covered with a clammy sweat, with insensibility, antimonials assisted by warm cordial stimulants have succeeded: With the same view the James' powder in small doses, with volatile alkali or opium, should be given, assisting its diaphoretic operation by warm drinks and a great quantity

* Sims on Epid. Disord. p. 49–50. Lond. 1773.

of bed clothes; Wine whey is now a valuable beverage; every thing must be done to prevent the emetic or cathartic operation of the medicines; Blisters and sinapisms are useful by stimulating the system: Under this treatment the pulse rises, a sweat appears, the patient becomes more sensible, the eyes clearer, and at last recovery is effected.*

Spasmodic stitches from wind pent up in the colon, and pressing up beneath the diaphragm are sometimes confounded with the pains of pleurisy, particularly in those who are debilitated by sickness, more particularly by disorders of the bowels; they strike generally from the breast to the back, and from side to side; are attended with a cough and affect the breathing; without the fever and siziness of the blood, which characterizes pleurisy, bleeding would in such a case do harm; laxatives and carminatives give ease; a blister also is equally applicable to both.†

2. In all cases of pneumonia of the least severity, bleeding from the system must be repeated, and the principal circumstances by which the frequency of its repetition is to be regulated, are the state of the symptoms, and the appearance of the blood drawn. Blood-letting is better borne in pleurisy than where the mucous membrane of the bronchia is the chief seat of disease; and as expectoration of mucus is one of the means by which all inflammation within the chest is relieved, venesection, on several accounts, must be practised with great caution when that symptom occurs. When suppuration has commenced, copious bleedings are inadmissible, but small bleedings may then often be resorted to, with the happiest effect. Although the presence or absence of buff is not to decide our practice as to future bleeding, still, when present, it may often materially *assist* us in our judgment. If the blood, besides being buffy, be cupped, and *fringed* at the edges, we need have little hesitation in repeating the evacuation. Should the blood appear with a flat surface of buff, and the coagulum be loose, further bleeding may indeed be still necessary, but it must be practised with very great caution. In the pneumonia of infants, and occasionally with adults also, leeches and cupping may be substituted for bleeding at the arm; but the circumstances warranting this are very few.

Tartar emetic has been given by M. Peschier of Geneva, in the doses of from six to twelve or fifteen grains in six ounces of water in the course of twenty-four hours in divided doses, in pleurisy and peripneumony; gentle laxatives being taken at the same time: His success was great by this plan, which was sometimes carried so far as to give thirty grains in twenty-four hours: After the second or third spoonful, the patient generally vomited; the medicine acted on the bowels and produced no sensible effect but speedily removed the disease: M. Peschier states that where small doses only were given as one grain or one and a half grain in the twenty-four hours, that there was greater retching than when larger quantities were taken; and that although vomiting and purging generally followed its exhibition, yet it cured with equal certainty

* Sims on Epid. Disord. p. 46-47.
† Pringle, Rush's, p. 126.

when it produced no sensible effect whatever: Blisters were sometimes applied over the pained part.

With regard to this practice there can be no question of the powers of antimony in subduing the inflammation of many of the phlegmasiæ, and from the connexion of the sympathy between the lungs and stomach, there can be no doubt but that it would be very useful in pneumonia; as the disease comes often to a fatal crisis in three days, we should advise the use of blood-letting at the same time, and in those cases where debility of the constitution prevents bleeding, the tartrite of antimony would no doubt be valuable. The experience of the first medical men in France and Italy is entirely in favour of its use.*

Dr. Batchelder, of New England, recommended several years ago the use of tartar emetic as a substitute for bleeding in pneumonia: He carried it so far as to produce complete evacuation of the stomach, and prescribed it under the same circumstances as bleeding is ordinarily directed, for which he considered it a valuable substitute.

Dr. Alexander McCall of Nashville, (Tenn.) also confirms its utility in the pleurisies of the south: In that warm climate they assumed a remittent form, with great discharges of bile: The tartar emetic was given to vomiting in large doses with the best effect: Purgatives and other remedies were used at the same time.

R. Mucil. gum. arab. ℥vi. Nitrat. Potass. ʒii. Tart. antimon. gr. ii. M. ℥ss. q. s. hor.

R. Mucil. glycirrhiz. ℥vi. Syrup. limon. ℥i. Vin. tartrit. antim. ʒii. Potass. nitrat. ʒii. M. ℥ss. cum tussis urgeat.

R. Ol. olivar. ℥iss. Mucil. gum. arab. ℥ivss. Oxymel squill. ℥ss. Aq. Menth. piperit. ℥ii. M. ℥ss. cum tuss. urgeat.

R. Ol. amygdalar. dulc. ℥i. Syrup. althææ ℥ss. Mucil. gum. acaciæ ℥ii. Aq. Fontan. ℥iii. M. capt. ℥ss. cum tuss. urgeat. C.

PURGATIVES.

3. Moderate purging, by castor oil, or the neutral salts, is a useful auxiliary in the treatment of pneumonia; but the advantages of purging are, upon the whole, much less obvious in thoracic diseases, than in those of the head or abdominal cavity. Any attempt to overcome decided thoracic inflammation by severe purging will always prove ineffectual, and often prejudicial.

REFRIGERANTS, EXPECTORANTS, &c.

Refrigerant medicines, as nitre, may be employed with great propriety.

R. Potass. nitrat. gr. xv. Aq. Fluvial oz. i. Syrup. limon. dr. i. M. f. haust. quart. hor. repet.

R. Sal tartar. oz. ss. Tartrit. antimon. gr. ii. Aq. Fluvial. oz. vi. M. dos. oz. ss. q. sec. hor. after it drink strong lemonade.

Spirit minderer. oz. ss. q. hor. in mucil. gum. arab.

R. Mucil. gum. arab. oz. iv. Aq. Fontan. oz. iss. Pot. Nitrat. scr. iiiss. Tart. antimon. gr. i. M. dos. oz. i. quaq. secund. hor.

A tea cup full of the strong infusion of the asclepias decumbens or pleurisy root, is much praised by Dr. Parker of Massachusetts. It is given every two hours.

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* Med. Recorder, vol. vi. p. 370.

A free expectoration being, as we have said, the means which nature most commonly adopts for carrying off inflammation within the chest, it might be supposed that expectorant medicines would prove useful; but the reliance to be placed upon them is very small. Antimony and ipecacuanha are the only ones of this class which can be recommended. The oxymel of squills is useful, but should be delayed till the inflammatory symptoms have in some degree subsided. R. Oxymel scill. oz. ss. Aq. Menth. sativ. oz. ii. Aq. distillat. oz. iii. Syrup. tolutan. oz. ss. F. mist. cap. oz. ss. bis die. Opium is quite inadmissible during the active stages of pneumonic inflammation. Even in the more advanced periods of the disease, it must be given with extreme caution, on account of its tendency to check expectoration. Some practitioners are disposed to place considerable reliance on the combination of opium with calomel. It will be found however a very inefficient substitute for blood-letting, and it is too active a medicine to be employed as a mere auxiliary.*

4. Blisters are unquestionably of the greatest importance in the treatment of pneumonia, but they should not be applied while the pulse is hard, and the blood appears cupped. It is not until the tone of the system has been lowered by venesection, that their good effects will become apparent.

As soon as the blister begins to draw, the patient should drink freely of barley water, giving a half pint with a scruple of nitre dissolved in it every hour till the blister draws: a solution of gum arabic will answer equally well; parsley and watermelon tea as being diuretic are also given.

Sometimes blisters are objected to; then a mustard poultice; cloths wrung out of hot water; bags of hot salt or sand; and a simple poultice of bread and milk, are useful, applied over the part. As soon as the blister heals up it is to be again applied, and kept running as long as there is any pain in the side. The application of cold on the affected side, though recommended, is too dangerous a remedy to be advisable. C.

5. If the inflammation has terminated in suppuration, besides the small bleedings already recommended when the difficulty of breathing becomes particularly urgent, advantage will be derived from the continued exhibition of the tincture of digitalis. The

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* A solution of gum ammoniac every five or six hours has a valuable effect; breathing the steam of hot water and vinegar, as recommended by Pringle and Huck, made by throwing it on a heated shovel and causing the patient to inhale it, as advised by Dr. Rush, gives immediate relief when the mucus is viscid; Three drams of spermaceti rubbed up with the white of an egg, a dram of carbonate of ammonia with seven ozs. of water make an excellent expectorant: Vomits sometimes discharge the viscid mucus in advanced stages of the disease with more effect than any medicines, and are borne well; they are a more safe mode of depletion than bleeding, sudorifics, or purging; and this opinion is confirmed by Rush, Pringle, and Huxham.*

* Pringle, p. 130. 1810.

strength of the patient must now be supported by a light nutritious diet, but wine is to be avoided. The operation of *paracentesis thoracis* is probably advisable in certain cases, both of vomica and empyema; but the observations of authors on this piece of practice are very scanty, and my experience does not enable me to supply the deficiency.

The collections of matter, which form between the cavity of the pleura and the lungs are often very great, protruding the spaces between the ribs: I have seen it in one case fill up the whole cavity of the thorax on one side. The operation should undoubtedly always be performed while there is no fixed disease of the lungs, of a consumptive character, and where the collection of pus is the consequence of recent inflammation, and the constitution is not much shaken; In young and robust habits, there can be no doubt it will often succeed if the above-mentioned favourable circumstances exist, and I have known a case in which the operation had the happiest effects, though the opening into the cavity of the abscess was deep, and penetrated far into the lungs, as was proved from the necessity of introducing a probe to keep it open: The subject in this instance was young and vigorous. In another case, in which an immense quantity of pus was drawn off, the patient died in consequence of his lungs being diseased, though the operation evidently did him much good. The general symptoms abate in most cases after the abstraction of a large quantity of matter from the chest; the appetite improves, the respiration is less anxious, and the cough gets better, but recovery depends upon the strength of the constitution, upon the state of the lungs, whether tubercular suppuration has taken place, or the local disease is merely an abscess. C.

6. The hepatized state of lung is to be combatted by external irritants, such as the ointment of tartarized antimony: R. Antimon. tartariz. dr. i. Unguent. cetac. dr. viii. Hydragyr. sulphur. rub. scr. i. M. Or the antimonial embrocation: R. Antim. tartariz. scr. ii. Tinct. Cantharid. oz. i. Aq. Ros. calid. oz. ii. Dissolve the antimony in the rose water, then add the tincture; rub the surface with it. By repeated blisters and issues, low diet, occasional aperients, and lastly by mercurial alteratives and diuretics, such as the pill: R. Pillul. hydrargyr. gr. iii. Pulv. scill. gr. i. Digitalis gr. i. M. f. pill. Take it night and morning.

PNEUMONIA BILIOSA OR TYPHOIDES.

This variety prevails principally in marshy districts and wet and cold seasons, and is produced by the joint effect of miasmata and alternations of temperature, intemperance, &c.; It is called in the southern or middle states, where it appears usually in the winter and spring, bilious or head pleurisy, the cold plague; by physicians, it has been denominated the pneumonia typhoides, and it is properly an inflammation of the lungs or pleura, combined with a remittent fever, exhibiting the whole series of varieties in grade from the highly tonic and inflammatory to the typhous form. In the eastern section of our country, the disease is seldom distinctly formed, presenting rather the faint nothus complication, with catarrh or some of the genus cynanche; South of the Potomac although it is sometimes completely evolved, it is seldom so inflammatory as it is found along the shores of Jersey, Delaware, and Maryland, and the farther south the more it is disposed to assume a middle typhoid complexion.*

* Potter on Bilious Pneumonia. Med. Record. p. 405. 1821.

Like the ordinary remittents of the summer, it attacks adults more frequently than children, who are seldom its subjects; The aged also are very little liable to it: Women, as they are less exposed, suffer less than men; and negroes, according to professor Potter, are rarely affected.

It comes on like remittent fever, with aching and soreness of the flesh, chills, local pains in the jaw, ear, head, arms, or legs—sometimes with nausea, diarrhœa, or vomiting, accompanied by a pain in the side; sometimes there are no premonitory symptoms, and as in ordinary remittents the chill appears followed by the hot stage. Sometimes the extremities are excessively cold to the touch, and no re-action follows; the patient is then dangerously ill. The general symptoms are attended with all the variety which characterises the ordinary remittent fevers, of course it is useless to enter into a particular description; the disease consists of ordinary fever, of a typhoid type, combined with a local determination to the lungs.* When it attacks the head, liver, stomach, or bowels, the complication of the disease of the lungs is frequently overlooked, and the complaint is mistaken for inflammation of other organs: The affection of the lungs, however, will be easily discovered by attending to the difficulty of breathing, the cough, &c. This disease is often insidious and deceitful in its career. The patient frequently appears better immediately before its fatal termination: The breathing, however, becomes suddenly laborious, the motion of the chest more irregular, a rattling in the throat comes on: the extremities become cold, and death finally takes place by effusion into the lungs.†

Obstinate constipation particularly in the hepatic cases, often appears as a symptom: sometimes a watery purging distinguishes the disease, at others the stomach is extremely irritable; or black discharges take place from the bowels and the disease goes off by a gentle perspiration.

The premonitory symptoms may be alleviated by warm pediluvia, with stimulating diaphoretics, and a free use of diluents: Where the habit is plethoric, blood-letting is sometimes useful in the forming stage; an emetic followed by a dose of calomel and opium, when there is any tendency to watery purging is also useful. When the disease is thoroughly formed the treatment should consist partly of that which is proper in typhus and pneumonia conjoined, and it should be active in proportion to its character; if synochus at first, the depletion must be more considerable; if typhus from the commencement, it must be more or less stimulating.

General bleeding in this form is commonly impossible, excepting in the very first hours of attack; even when taken from the surface of the chest by scarifications, they have continued to bleed so profusely as to threaten death, so completely is the crasis of the system broken up. This, however, occurs only in extreme cases. The signs of this state of debility are similar to those which have been given under the head of the typhoid form of continued fever, viz:

Rigours, cold extremities, pain between the shoulders, along the spine and the back of the head, with much difficulty of breathing; cold perspiration; general feelings of misery and wretchedness, great pain, with a sense of tearing and burning in the breast;‡ the pulse at first small, hard, and corded; slight retching, with a greenish fluid running from the mouth; the tongue covered with a brown crust, with the edges and end smooth, dry, and red, the thirst great, the breathing laborious and irregular; the skin hot and parched, urine scanty and high coloured; delirium, with great prostration of strength and spirits; the stools offensive and dark; the expectoration streaked with blood.§

In robust and plethoric subjects, some blood may be taken: and repeated in small quantities till the pulse is reduced; or if the pulse be already low, it may be taken by cups from the chest; or if these be not advisable, dry cups

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* See Cartwright on Pneumonia Biliosa, in the Med. Recorder, p. 65. vol. x.
† Med. Recorder, p. 65. ‡ Ibid. 590. 1823. § Ibid. 586. 1823.

may be applied, and afterwards blisters. The pulse must be narrowly watched, and if it flags, dependance must be placed, in the first stage, upon emetics of tartrite of antimony, or ipecacuanha; together with purges of calomel and senna, or magnesia, salts, castor oil, or small doses of tartarized antimony frequently repeated, till the stools become natural. The skin must be kept soft with nitre, senega tea, and as the system debilitates, wine whey, camphor and opium, and carbonate of ammonia may be given to keep up the expectoration, and support the strength. As the pain in the breast, difficulty of breathing, and other symptoms of the pneumonic affection abate, it is necessary to give tonics: The system must also be supported by mild nourishing food, as tapioca, sago, arrow root, &c. administered in small quantities and frequently; the irritation, by blisters on the chest, in the mean time should also be kept up. C.

CHAPTER XI.

SUBACUTE AND CHRONIC BRONCHITIS.

Prevalence and general Character of Bronchial Inflammation—Its Subdivisions—Subacute Bronchitis, or Peripneumonia Notha—Of Chronic Bronchial Inflammation—Connection of Bronchitis with Abdominal Disease—Of Dropsy consequent upon Chronic Bronchitis—Morbid Appearances—Treatment of Bronchial Inflammation by Antiphlogistic Measures—Stimulants—Opiates—Expectorants—Blisters.

GENERAL CHARACTER.

The most frequent of all the diseases of cold climates is subacute and chronic inflammation of the mucous membrane of the bronchia, commonly known by the name of *winter cough;* and it cannot therefore but be considered a matter of great surprise, that the pathology of this disease should have been so long overlooked. By all the ancient writers, and by modern authors, up to a very late period, the disease was noticed, indeed, under the vague and unscientific denominations of tussis, catarrhus senilis, rheuma catarrhale, and bastard peripneumony; but their ideas concerning it were very confused and unsatisfactory. The nature of the peripneumonia notha of Sydenham, in particular, was a theme of endless controversy.

Dr. Badham, in 1808, first wrote expressly on inflammation of the mucous membrane of the bronchia, and gave to it the appropriate name of bronchitis. His views concerning this affection are very clear and just, and his work deserves to be noticed, as a pathological essay of the highest merit. The attention of the author was, perhaps, too exclusively directed to that severe but rare disease, which we have already alluded to under the title of *acute bronchitis.* His deficiencies, however, have been, in a great measure, supplied by the industry of later writers, among whom Dr. Hastings, of Worcester,* deserves particular

* A Treatise on Inflammation of the Mucous Membrane of the Lungs, by Charles Hastings, M. D. London, 1820.

mention; and the pathology of the mucous membrane of the bronchia, therefore, though far from being complete, may now be considered as having attained some degree of precision.

The general character of chronic bronchial inflammation is drawn from the symptoms of cough and mucous expectoration; but dyspnœa, attended with wheezing, is nearly always present also, and with it may be observed a tendency to spasmodic exacerbation of all the symptoms. It is obvious, therefore, how closely allied are the symptoms of bronchitis to those of croup and peripneumony. To some, perhaps, it may not appear necessary to draw very minute distinctions between the inflammations of different portions of the same membrane,—still less to proceed to a subdivision of the cases of bronchial inflammation; but it will not, I am persuaded, be looked upon in this light by the practical physician. He will keep in view the extreme frequency of these affections; he will acknowledge the necessity of variation in his mode of treatment, and be sensible of the utility of regulating that treatment by some sort of pathological principle. I shall offer no apology therefore for attempting to discriminate the different forms of chronic bronchial inflammation which we meet with in practice, or even for pushing this division beyond the limits which Dr. Badham and others have hitherto assigned it. It is unnecessary to premise, that these distinctions are arbitrary, and made solely with a view to practice. A gradation may be traced in nature, from the most acute form of bronchitis, which attacks suddenly, and proves fatal, perhaps in a week, to that, the origin of which is imperceptible to the patient, and which he carries about him for a long series of years.

ITS SUBDIVISIONS.

Three great divisions of chronic bronchitis might be made, having a reference to the state of the accompanying constitutional symptoms. Sometimes fever is present, to a greater or less degree; sometimes the constitution is wholly unaffected; and at other times, lastly, it is in the state of *asthenia;* but a more extended view of the subject will be requisite for the purposes of practice.

SUBACUTE BRONCHITIS.

1. There is a species of bronchitis which is attended with considerable febrile derangement of the system, and which runs its course in about three weeks, or a month, generally so severe as to confine the patient to bed for a part of the time. This I would distinguish by the name of *subacute* bronchitis. It is the peripneumonia notha of Sydenham, who has admirably described its symptoms and treatment. To those who have once suffered by

it, it is apt to recur every year, and commonly about the same season. It is attended by the expectoration of puriform mucus, and respiration is performed with a wheezing noise. Occasionally, the cough occurs in paroxysms of great violence, terminating by the vomiting of food; and the disease then so closely resembles the hooping-cough, that, for a time, it is with difficulty distinguished from it; but the diseases are very distinct in their origin, termination, and treatment. Subacute bronchitis is to be treated on the common principles applicable to all inflammatory diseases. It requires venesection two or three times, to the extent of ten ounces each time, and with intervals of two or three days, and is much benefited by saline and antimonial medicines.*

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* PERIPNEUMONIA NOTHA.

When pleurisy occurs in the debilitated, the old, or the phlegmatic, who have been subject particularly to weakness of the chest, and to catarrh, it assumes the following character, generally known under the name of peripneumonia notha, or bastard pleurisy.

The patient is cold and hot alternately, has acute pain in the head, with a worrying cough; The respiration is quick, oppressed, difficult, and wheezing; his cheeks are swelled and the eyes slightly inflamed; the pulse is intermitting, attenuated, and quick; there is considerable sickness at stomach, with a rejection of fluids during the paroxysms of coughing; and the recumbent posture is painful, as also lying on one side: Giddiness, general lassitude, and obscure pains in the chest, also attend it: These symptoms are sometimes alarming from the first moment of attack; at others the disease resembles an aggravated catarrh and is removed by very slight remedies.* As the disease generally occurs in the debilitated, the loss of blood must be carefully guarded against, as a few ounces often cannot be taken without inducing a dangerous degree of debility.

A blister should be applied over the chest to relieve the local symptoms; followed by an emetic of ℈i. of ipecacuanha with 10 grs. of calomel, and afterwards by small doses of tartar emetic, with warm senega tea or wine whey to excite a perspiration, which if kept up four or five hours will be sufficient to effect a cure.†

The expectorants most proper in the form are the gum ammoniac, squills, and in cases where the debility is considerable the turpentines may be ventured on, as the spirits of turpentine, the balsam of Peru, &c.

The following formulæ will be found valuable, where there is little fever.

Gum. Ammoniac. dr. ii. Oxymel. scillæ. dr. iii. Aq. Fluvial. oz. vi. M.

R. Mucil. glycirrhiz. oz. vi. Oxymel. scill. oz. ss. Tartrat. antimon. gr. i. M.

R. Cetacei dr. iiss. Vitell. ovi, q. suf. ad solut. Potass. Nitrat. scr. iiiss. Tinct. Tolut. dr. ii. Aq. Pulegii, oz. ivss. M.

R. Syrup. Tolutan. oz. iii. Elix. Paregor. oz. ss. Vin. Antimon. tartrit. dr. ii. Mucil. gum arab. oz. ii. M. oz. ss. re nata.

R. Vin. Antimon. dr. ii. Elix. Paregor. oz. ss. Oxymel. scill. dr. i. Gum. Ammoniac. dr. i. Aq. Fluvial. oz. v. M. oz. ss. pro re nata.

The blister must be kept open, and repeated as it heals up.

Cream of tartar; small doses of calomel and of tamarinds should be given to keep the bowels gently open: an antiphlogistic regimen should also generally be pursued.

* Thomas. † Thomas and Good

2. This disease, if neglected in its early stages, sometimes terminates in ulceration of the mucous membrane of the bronchia, the principal symptom characterizing which is the expectoration of a purulent matter, of a *greenish* colour and smooth appearance. This, with attention to the preceding symptoms, will assist in distinguishing the disease from pthisis pulmonalis, where the matter expectorated usually assumes the form of globules of a white, or straw colour. The pulse here is frequent and often full, while, at the same time, great debility prevails. The patient can generally take a full inspiration, which is scarcely ever possible in an advanced stage of consumption, as will hereafter be more fully noticed. Ulceration of the bronchia occurs only in persons advanced in life. It is a disease of great danger, but still occasionally subdued. The ulcers are found upon dissection to be always superficial, and generally small. This disease will be assisted by a moderate exhibition of tonics, as myrrh; but upon any urgent aggravation of the symptoms, blood must be taken from the arm to the extent of four or six ounces.

CHRONIC BRONCHITIS.

3. These cases are very rare, however, when compared with those which I would designate by the name of *common chronic* bronchitis, and which constitute the great bulk of all the cases of chronic or *winter* cough. The symptoms of most importance in a pathological view are, the frequent pulse and the slightly furred tongue which attend it, pointing out that the constitution is in a state of febrile excitement. There is great variety in the other symptoms, but a few of the leading points may be worthy of notice. When pain is complained of, it is generally referred to the head, or the iliac region, referable, I believe, to the injury done to the bowels by the mere violence of the cough. A deep inspiration will almost always be followed by a fit of coughing, but it will seldom cause or aggravate pain. The difficulty of breathing is often very trifling when the patient is sitting quiet, but it is highly increased by any exertion of walking, more particularly by going up stairs, or ascending a hill. After such an effort the patient appears gasping for breath, and ready to faint from weakness. He can sometimes lie on both sides, but the horizontal posture generally increases dyspnœa; and consequently, in the severer forms and latter stages of the disease, he passes both his days and his nights in a great chair.

The cough, in common chronic bronchitis, occurs in fits, lasting several minutes; and these, in a vast proportion of cases, happen in the morning when waking, or on going to bed at night. The irritability of the membrane is obviously increased in this disease; and exposure of the skin to the cold air proves, by sym-

pathy, a source of irritation. In like manner, a change of weather, or the inhalation of smoke or vapours, or the taking in of food, brings on a fit of coughing. The matter expectorated varies very much in appearance, but still more in *quantity*. Sometimes it is thick and ropy, sometimes thin and frothy, and occasionally in such enormous quantity as to excite astonishment. I have seen three pints of a thin mucus brought up in twenty-four hours, and that without any other very urgent symptom. Some attention, with a view to practice, is to be paid, as to whether the expectoration be easy or difficult.

Coldness of the lower extremities is generally complained of, as was long ago noticed by Hoffman. The patient becomes weak, and makes great complaints of the langour and lassitude which oppress him. As the disease advances he loses flesh, and a disposition to phthisis is often suspected. However difficult or needless it may be to establish an accurate diagnosis between the acute forms of bronchitis and peripneumony, that between chronic peripneumony (or consumption) and the subacute and chronic bronchitis is both important and attainable, but it cannot be clearly explained until the symptoms and progress of the former disease have been under discussion.

ITS CONNECTION WITH ABDOMINAL DISEASES.

Besides the symptoms of febrile excitement already mentioned, it will commonly be found, that in the early stages of all severe bronchial affections, and in the latter periods of slighter ones, the functions of the stomach and bowels are impaired. There is loss of appetite, a weak digestion, flatulence, an unpleasant taste in the mouth in the morning, and costiveness. The duration of this form of bronchial inflammation is very various. It has very little tendency to wear itself out, and, if suffered to run its own course, continues often during the whole winter, and yields only to the change of season. It is not a disease of danger, until by frequent recurrence it has worn down the system.

4. There is a peculiar form of bronchial inflammation unattended by any symptoms of a disordered constitution. The patient, on first waking, is attacked with a severe and loud fit of coughing, which continues to harrass him for half an hour after rising. It recurs occasionally during the day. It is attended with little or no expectoration, and appears to consist chiefly in an *increased irritability* of the membrane. But that it is closely allied to a state of inflammation is probable from this, that the affection can always be traced to cold. It is not permanently benefited by any plan of treatment which I have been able to devise, except change of air. The hydrocyanic acid, given in doses of three drops twice a day in lac amygdalæ, has occasionally proved useful.

5. Bronchial inflammation is sometimes attended, particularly in old people, with those marks of loss of tone in the system which pathologists have generalized under the term *asthenia.* This form of the affection has long been known by the name of *catarrhus senilis.* It is marked by profuse expectoration, a feeble and languid pulse, a disposition to sleep, and extreme weakness of the limbs. It proves fatal to many old people—it is usually said, by suffocation, but this is doubtful; for in the latter stages of bronchial inflammation of the true asthenic character, the effusion of mucus in some measure ceases, and the patient dies from *exhaustion*, often very unexpectedly. This form of chronic bronchitis is sometimes met with at an earlier period of life. Women who have suckled their children too long are occasionally the subjects of it. It proves particularly tedious and severe in such persons as have led irregular lives, and indulged freely in spirituous liquors; but in them it is generally associated with *hepatization*, or some other form of disorganization of the substance of the lungs.*

Chronic bronchitis is, certainly, for the most part, a primary disease, and attributable to cold and moisture. I have observed that foggy weather is very apt to bring it on. But it frequently also supervenes upon other diseases, both of an acute and chronic kind; such as the febrile eruptions, chronic cutaneous affections, and diseases of the abdomen. The connection of bronchitis with disordered conditions of the abdominal viscera has long been known. Worms have been observed to create a cough. Dyspepsia, and diseases of the liver, are often attended by the common symptoms of chronic bronchitis. In some cases this connection may be accidental; but in many, it is, I believe, strictly *sympathetic;*—that is to say, the disease of the bronchia has not

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* CHRONIC COUGHS.

Under this head may be enumerated several kinds of cough, which require treatment, without being connected with any evident general disease.

The cough, in its mild form, which is peculiar to old men, is distinguished by a discharge of mucus, easily brought up: It is sometimes aggravated by cold feet, and sudden exposure to cold and damp: Nothing more is required for its treatment, than simple stimulant pectorals; of lintseed tea, with gum ammoniac; benzoin; styrax; tar water; tar pills; extract of liquorice; laudanum and antimonial wine; garlic; canada balsam, and paregoric: It only admits of palliation.

Dr. Whytt describes a species of cough, which is peculiar to the nervous, gouty, dyspeptic, and hysterical. It returns at stated periods; it is not violent, and is capable of being suppressed by the patient, and is attended with a thin discharge.

This variety is best treated by combining bitter tonics with pectoral medicines; as porter; opium; hyoscyamus; columbo, quassia, &c., and giving the patient such a diet as best suits with his prevailing temperament: camphor and opium, volatile alkali and laudanum, will also be useful in this species. C.

its origin in cold, and can be relieved only by relieving the abdominal affection. The precise nature of this relation between the viscera of the thorax and abdomen, it is, perhaps, impossible to ascertain exactly; but it should be borne in mind, that it is to a certain degree mutual; and therefore it becomes often a matter of great difficulty to determine, in complicated cases, whether the system of treatment should be directed, in the first instance, to the relief of the thoracic or of the abdominal derangements.

DROPSY CONSEQUENT ON CHRONIC BRONCHITIS.

Among the symptoms which supervene on chronic bronchitis, œdema of the feet and legs deserves particularly to be noticed. Dr. Hastings seems inclined to attribute this dropsical effusion directly to inflammation of the mucous membrane,* but general pathology would rather induce us to suppose that some mechanical impediment exists in such a case to the free passage of blood through the lungs, whereby the right ventricle of the heart is gorged or distended, and the whole venous system disturbed in its function.

MORBID APPEARANCES.

The morbid appearances presented by the mucous membrane of the bronchia, after being long subject to chronic inflammation, do not appear to throw much light on the *ratio symptomatum*, or to direct us in any degree to the proper treatment of the disease. The membrane appears discoloured; sometimes of a vivid red colour, sometimes inclining more to purple. Its structure is often thickened, and not unfrequently the surface of it is pulpy. Mucus is generally found, to a considerable extent, filling the bronchia and air-cells.

TREATMENT.

The general principles of treatment in subacute and chronic bronchitis have never been very accurately laid down by authors. It must be regulated by reference partly to the constitutional, and partly to the thoracic symptoms. In the subacute forms of the disease, antiphlogistic measures of greater or less activity are always to be resorted to. When the cough occurs in paroxysms of extraordinary length or violence, or when there is a tensive pain of the forehead, or of the iliac region, blood must be taken from the arm. In very severe cases, a repetition of small blood-lettings is necessary to overcome the disease. In cases of less

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* Hastings on "Inflammation of the Mucous Membrane of the Lungs," ch. v.

urgency, it will be sufficient to direct saline draughts, with twenty drops of tincture of hyoscyamus, and ten of antimonial or ipecacuanha wine. The bowels should never be suffered to become costive. It was a favourite maxim with the old physicians, that it is only in stomach (or sympathetic) coughs that purgatives are beneficial, and that the true pectoral coughs are more relieved by diuretics. This is true to a certain extent, but occasional purging by the draught, R. Infus. senn. compos. oz. i. Magnes. sulphat. dr. ii. Tinctur senn. Tinctur. Jalap. Syrup. sing. dr. i. M. f. haust., will nevertheless be found very beneficial.

STIMULANTS, &c.

Where the system is much debilitated, the tongue clean, and no thirst present, advantage will be derived from the exhibition of ammoniacum, myrrh, and acids. R. Mist. ammon. dr. vi. Acet. scill. dr. i. Tinct. opii, gtt. vi. Aq. carui, dr. iii. M. tert. vel quart. hor. sumend. In this state of the system, narcotics, more especially opium, are not only useful, but often quite indispensable. They allay that irritation of the membrane which would otherwise prevent the patient from getting sleep. They are best given in a full dose at night. When the irritability of the membrane is very great, with little constitutional disturbance, demulcent mixtures, with the addition of a proper proportion of the vinegar or tincture of squill, will be found very serviceable: R. Muc. Acac. oz. i. Aq. distill. oz. iii. Syrup. tolut. Aq. cinnam. āā oz. i. Oz. ss. quaq. quart. hor.

R. Ol. amygd. oz. i. Acac. gum. dr. iii. Aq. distill. oz. vi. Syrup. rhæad. oz. ss. tere ol. cum gummi ; dein adde aquam et syrup. Dos. oz. i. quater indies.

R. Cetac. dr. ii. Vit. ov. et Syrup. althææ, oz. ss. Aq. cinnam. oz. ss. Aq. Fluvial. oz. ivss. M. oz. ss. tuss. urgent.

I have derived much advantage from this formula: R. Oxym. scill. Tinct. camphor. compos. Spirit. æther. nit., sing. oz. ss. Infus. lin. oz. vi. Oz. i. tuss. urgent.; but the indiscriminate employment of those medicines which have been called *expectorant*, in cases of chronic bronchial inflammation, cannot be defended on any principle, theoretical or empirical.

Combinations of expectorant with anodyne medicines are familiarly known under the name of *cough pills*, and almost every practitioner has his favourite formula. That which in my hands has proved very serviceable is, R. Extract. conii. dr. ss. Pulv. scill. gr. x. Pulv. ipecac. gr. v. M. divid. in pill. x. equal. One pill may be taken twice or thrice a day. Most of these formulæ contain a proportion of calomel, and its employment in small doses undoubtedly contributes to relieve the breathing in obstinate cases of chronic

bronchitis. It will be found indeed, in all cases of dyspnœa unattended by corresponding fever or cough, that the exhibition of three or four grains of calomel in a pill affords very effectual relief. Five grains of Plummer's pill taken at bed-time is sufficient in slighter cases. When the tone of the stomach is impaired by the long continuance of the disease, bitters are of considerable service, and may be advantageously united with the narcotic and expectorant medicines already recommended. R. Infus. Gentian. compos. oz. ss. Aq. Cinnamom. dr. v. Carbonat. sod. gr. x. Vin. Ipecac. gtt. x. Tinct. opii. gtt. v. Syrup. dr. i. M. Take thrice a day. Coughing is an act in which the diaphragm is mainly concerned, and hence it is that a gentle stimulus to the stomach so often aids expectoration.

Blisters are useful in almost every form of winter cough, when applied judiciously. The symptoms, which in an especial manner call for their employment, are a cold skin, a languid circulation, and an oppression in the breathing. An uniform moderate temperature, warm clothing, and a light diet, are quite indispensable. If the disease prove very obstinate, a change of air should be directed; for it may then be considered as kept up, in some measure, by habit. Warm weather has a very striking influence in many cases of obstinate chronic bronchitis; and therefore when the disease has recurred several times, and is brought on by slight vicissitudes of temperature, it may even be proper to recommend removal to a warmer and steadier climate.

CHAPTER XII.

CONSUMPTION.

General Pathology of Consumption—Morbid Conditions giving rise to Consumptive Symptoms—Of Tubercular Phthisis in detail—Origin and Nature of Pulmonary Tubercle—Its Connection with Scrofula—Progress of the Symptoms in Consumption—Phthisis Incipiens, and Confirmata—Characters of Hectic Fever—Diagnosis—Prognosis—Principles of Treatment in the incipient, and in the confirmed stage of Consumption.

GENERAL PATHOLOGY.

Chronic inflammation of the *substance* of the lungs is so uniformly connected with wasting of the body, as to have obtained for itself the distinguishing appellation of *consumption*, or *decline*. Its amazing prevalence, and almost uniform mortality, entitle it to the fullest attention; but independent of this, it is a subject which involves many curious pathological speculations.

MORBID CONDITIONS GIVING RISE TO IT.

Consumption is a febrile disease, but the character of the accompanying fever differs from any thing we have yet examined. It is the chronic inflammation of a cellular structure, but that structure had previously been diseased. It occurs, for the most part, in that peculiar habit of body (the *scrofulous*) which is characterized by a delicate organization of blood vessels; and it exhibits therefore, in all its stages, a strong disposition to *hæmorrhage*.

Cough, with expectoration, difficult breathing, and wasting, are the *leading* symptoms of consumption; and pathology would bear us out in applying the term at all times to such a combination of symptoms. But physicians have generally agreed in restricting it to those cases where the symptoms arise from *ulceration of disorganized lungs*, the principal disorganizations being hepatized induration, and tubercle. There are other morbid conditions of the respiratory organs however which may, and

frequently do, give rise to all the symptoms of genuine consumption. They are, first, chronic inflammation and ulceration of the larynx, trachea, and bronchia; secondly, chronic inflammation of the pleura; and thirdly, vomica, the sequel of acute inflammation in lungs previously *sound.* The second of these forms of thoracic disease is rare, and hardly distinguishable during life. The others have been already treated of, and they are only referred to in this place, that the student may have before him, in one view, a sketch of the general pathology of consumptive diseases.

Of the two principal forms of consumption, viz. ulceration of *hepatized* lungs, and ulceration of *tuberculated* lungs, it is unnecessary that I should treat separately. They give rise to nearly the same train of symptoms, they are equally dangerous, and they are not unfrequently found to co-exist.* Of the former it is sufficient to say, that it is the occasional consequence of pneumonic inflammation and repeated catarrhs in any habits, but more especially in persons indulging freely in the use of ardent spirits. It may occur therefore at all ages, but is most common in the middle period of life;—viz. between the ages of thirty and fifty.

TUBERCULAR PHTHISIS.

The great and peculiar feature of phthisis pulmonalis is its connection with *tubercle of the lungs;* and before the phenomena of the disease, the diagnosis, or prognosis, can be properly understood, the nature of tubercle must be explained.†

ORIGIN AND NATURE OF TUBERCLE.

Tubercles are rounded, firm, white bodies, varying from the size of a pin's head to that of a garden pea, frequently found interspersed through the whole substance of the lungs, but most usually met with in its upper and posterior parts. Frequently they occur in clusters. In their earliest state they are solid, and of cartilaginous hardness. No blood-vessels can be traced in them, even by a microscope, and the finest injection does not

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* Dr. Willan remarked, in 1797, that of the cases of consumption occurring in London, not more than *one-fourth* arose from the slow and successive suppuration of tubercles in scrofulous constitutions; but this is probably underrating the proportion of tubercular phthisis; for of thirty-five consecutive cases of consumption, examined at St. George's Hospital, eight were of pure hepatization, twenty-two of pure tubercular disorganization, and five were mixed cases.

† On this subject consult Dr. Stark's Works, 4to. 1788 (or Medical Communications, vol. i. page 359); Dr. Baillie's Morbid Anatomy, and the works of Laennec.

penetrate them. They are situate, not in the air cells, but in the proper cellular texture of the lungs, and are without any cyst.

Even in this state, tubercles create a degree of impediment to the breathing, by occupying a considerable space in the body of the lungs. They prevent the free transmission of blood through that vascular organ, and occasion, therefore, a rupture of some of the smaller vessels, and consequent spitting of blood, when by any cause the impetus of the blood is increased. But these are only a small part of the evils which result from the presence of tubercles. Though no blood-vessels can be traced in them, they are susceptible of inflammation, the effect of which is to convert the tubercle into a white capsule containing pus; or when a cluster of tubercles inflame together, to form an abscess of considerable size. The internal surface of the bronchia communicating with this abscess appears red and inflamed. The contiguous portions of the substance of the lungs are differently affected in different cases. Sometimes their texture is unaltered, but more commonly it is rendered red, solid and impervious to air. The smaller blood-vessels are commonly destroyed; and the larger, before they reach the abscess, are wholly, or partially, filled with a kind of fibrous substance, by which severe hæmorrhagy is prevented, even though a great extent of lung be injured. It is imagined that, upon an average, three-fourths of the substance of the lungs are rendered unfit for respiration in the progress of consumption, before the patient sinks.

Tubercles have been occasionally found in the lungs of children at a very early age, but they are not commonly met with until a short time before the completion of the growth of the body. In a few cases they appear to have been formed at a very *advanced* period of life. They are at all times morbid growths; and it is certainly an important object to determine, if possible, the manner in which their formation takes place, and the circumstances which give occasion to it. On these questions, however, pathologists are much divided. Some maintain that tubercles are deposited by a peculiar action of vessels, altogether distinct from inflammation, that their formation is unattended by the usual accompaniments of inflammatory action, and that in fact inflammation is the consequence rather than the cause of tubercle. Others contend that tubercles (more especially as they occur in the lungs) are simply the result of a low degree of common inflammation; and this opinion is corroborated, first, by finding them associated with the other more acknowledged *effects* of inflammation, and secondly, by observing that when occurring singly, their appearance has been preceded by the ordinary symptoms of catarrh or peripneumony.*

* On this subject, see Dr. Alison on "The Pathology of Scrofulous Diseases," in the Transactions of the Med. Chir. Society of Edinburgh, vol. i.

ITS CONNECTION WITH SCROFULA.

The question in dispute is one of the most difficult in general pathology, and it will probably long remain open to discussion. All parties, however, are agreed in the important fact of the intimate connection of tubercle in the lungs with the *scrofulous* diathesis. This appears in the occurrence of phthisis in scrofulous families, and in persons who exhibit other marks of the scrofulous disposition. It is illustrated also by the analogy which subsists between the progress of inflammation in a tubercle, and in a *gland* affected by scrofula. In both it is of the same *chronic* kind, tending to the formation of the same sort of thick curdly pus. It is brought on in both by the same causes, and relieved by the same means.

The scrofulous disposition is shown by a clear and very fair skin and hair, bright eyes, white teeth, delicate, rosy complexion, sanguine temperament, great sensibility, thick lips, and large veins; The formation of body which predisposes to consumption consists in a narrow chest, and prominent shoulders. Certain occupations produce this disease, stone cutters, millers, needle pointers, and workers in certain metals are liable to it; Excesses also, as indulgence of the venereal passion; debilitating evacuations, as diarrhœa, fluor albus, diabetes; Violent passions, as anxiety, grief, disappointment, and want of exercise also favour its appearance; playing upon wind instruments, the application of cold, by sudden changes of apparel, exposure of the body to cold air,* are frequent causes of this disease. It has also been produced by the lodgment of a bone in the œsophagus; the recession of the itch, of the measles, the healing of a fistula in ano, have also been followed by consumption. Worms, syphilis, also are said to produce it: Rapid growth, malconformation of the chest are likewise its causes; drinking vinegar to improve the figure is also mentioned among them by Dessault. C.

The symptoms of tubercular consumption are next to be explained, and they are sufficiently uniform to admit of a precise detail.

PROGRESS OF SYMPTOMS IN CONSUMPTION.

A sense of tightness across the chest and of internal heat, with a slight tickling cough, are among the first symptoms that mark the approach of a decline. The patient is languid, and has the feeling of slight pains in some part of the chest, when he ascends a flight of stairs, or takes any considerable exercise. The pulse will commonly be found, even in this early period of the disease, somewhat accelerated. These symptoms, however, being very slight, are often overlooked, both by the patient and his friends, until the occurrence of *hæmoptysis,* which may be said to characterize the first stage of phthisis pulmonalis, with as much certainty as purulent expectoration does the second. The spitting of blood occurs at irregular times and in variable quantities. By

* Thomas.

degrees the cough becomes more and more troublesome. A fixed pain in some part of the thorax, or about the pit of the stomach, is now complained of. Respiration is hurried, and the patient unable to expand the chest, even in the slightest degree. There is difficulty in lying on one or other side, or sometimes on the back; and, at length, the nature of the disease is put beyond doubt by the occurrence of *purulent expectoration* and *hectic fever*.

The expectoration of a thick pus, generally in the form of globular lumps, of a straw colour, occasionally tinged with blood, and always more or less mixed with mucus, is indeed the peculiar feature of this disease; but perhaps too much stress has been laid upon the necessity of distinguishing in pulmonic diseases between the different *kinds* of expectorated matter. An extensive observation of disease will show that its appearance varies extremely, not only in different individuals, but even in the same individual on different days, and different times of the day; and that its qualities may alter, without materially altering the danger, still less the nature of the disease.

Its general properties are as follows: It is uniform in consistence, of a mawkish taste; of the colour of cream, consisting of minute globules floating in a serous fluid: It is not coagulable by heat; but when mixed with a saturated solution of muriate of ammonia it coagulates, and forms a semi-pellucid, viscid, stringy substance, not diffusible in water, when a caustic lixivium is added.

Pus has an extremely disagreeable smell when heated; diluted acids do not coagulate it; alkalies, however, easily produce this effect. It sinks in water; is easily diffused in warm, but not much so in cold water. C.

HECTIC FEVER.

Hectic fever (the other diagnostic mark of confirmed phthisis) is the fever of irritation and weakness. It is commonly attendant on extensive and protracted ulceration, because this is one of the most common ways in which that irritation throughout the body, and that degree of constitutional weakness is kept up, which is necessary to its development. But genuine hectic sometimes occurs without any ulceration, as in delicate women who suckle their infants too long, in children of weak habits, and in adult men, after confluent small-pox, or in the latter stages of diabetes. Under all circumstances it presents very nearly the same characters. It is a *remitting* fever, having its exacerbation between five and six o'clock in the afternoon, at which time rigors occur, lasting about an hour, and succeeded by an increase in the quickness of the pulse, the heat of skin, the thirst, general uneasiness, and restlessness. About ten o'clock at night the sweating begins, which is the natural crisis of the hectic paroxysm. The patient then gets some sleep, but the sweating for the most part continues; and when he wakes in the morning

he finds himself bathed in perspiration. It is a remarkable circumstance, that this disposition to sweating is sometimes local, being confined, for instance, to the head and neck, or to the inferior extremities. These are the *colliquative* or weakening night-sweats, which afford so striking a characteristic of hectic fever.

This fever seems to depend upon a peculiar irritation; the action of pus upon the nerves: we doubt the existence of genuine hectic from any other cause, except this poison. It bears a strong analogy to the operation of marsh miasmata, and although it usually assumes the remittent type, it sometimes approaches very near to intermittent fever. It occasionally appears in two paroxysms in twenty-four hours, a morning and evening exacerbation. In a few instances, every alternate paroxysm is more considerable, as we observe it in some mild remittents: indeed in one day it is scarcely to be observed, while it is distinctly marked on the next.

The fever consequent to long protracted lactation in delicate subjects, does not correspond entirely with the phenomena occasioned by purulent irritation. It does not seem to us to arise from any change in the secretion of milk, but from the irritability of the glands imparting a sympathetic irritation to the heart. An analogous condition of the kidneys probably exists in long continued cases of diabetes. These fevers sometimes terminate in phthisis, in predisposed subjects; but separately considered, are seldom accompanied by cough, diarrhœa, or any other organic affection, and generally terminate in health under good treatment. P.

The pulse in this form of fever is always very quick, generally averaging 120, but frequently it will be found for weeks together as high as 144. The skin is hot, but not in proportion to this extraordinary rapidity of the pulse.* The vessels of the adnata lose whatever redness they may have had in health, and the eye becomes of a leaden or pearly hue. The countenance is pale in the morning; but towards evening, when the febrile exacerbation occurs, the cheeks exhibit that circumscribed redness, known by the name of the *hectic flush.* The urine, from the very first, is high coloured, and deposits, on cooling, that copious branny red sediment upon which the older pathologists laid so much stress.

Under common circumstances, the functions of the stomach are but little impaired. The appetite may even continue good. There is not much thirst, except towards night, or what results from the medicines taken; and the bowels are at first unaffected. Yet with all this, emaciation takes place, and frequently proceeds rapidly, and to an extreme degree. This is first observable in the face, which becomes thin and long, and the eyes appear sunk in their orbits. Closely connected with the emaciation, is the

* We presume the author intended to express the *frequency* and not the *quickness* of the pulse. By the former we mean the number of pulsations in a given time, as, a minute; by the latter, the time in which a single pulsation is performed. This distinction is necessary in this disease, because the pulses are almost always frequent, but rarely quick. P.

loss of muscular power, which also proceeds to a great extent, and is often the earliest prominent symptom of this peculiar affection of the system.

A circumstance well deserving of attention in the phenomena of hectic fever, as pointing out a striking difference between it and idiopathic fever, is the little disturbance which takes place in the functions of the brain. Head-ache does not always occur during the periods of exacerbation, and it is seldom present at other times. Delirium is very rare, except perhaps for a few hours before the patient's death. Even this is not constantly observed, for in many instances the senses remain perfect even to the last gasp of breath which is drawn. A degree of languor generally prevails, but in a large proportion of cases the mental faculties continue quite unimpaired throughout the disease. I have sometimes even thought, that a præternatural vigour of mind was perceptible while the body was suffering under the most exquisite form of hectic. One exception must be made, applicable at least to that which attends consumption. On the prospect of his own recovery, the judgment of the phthisical patient is nearly always erroneous. The most obvious indications of danger are overlooked; and, full of hope, he is busied only in the anticipation of approaching convalescence.

The only other peculiarity of hectic fever which I have to notice, is the tendency which exists, in its latter stages, to an affection of the mucous membrane of the ileum.* This is indicated by colliquative diarrhœa, the occasional appearance of blood in the motions, and a præternatural redness and *tenderness* of the tongue, followed in most cases by the appearance of aphthæ in the mouth. On dissection, especially if such symptoms have been present for any length of time, inflammation and ulceration of the ileum of a peculiar character are met with, but not so constantly as to warrant the belief, that in all cases these symptoms depend on an *inflammatory* state of the intestines. Sometimes the bowels are merely irritable.

Such are the characters of hectic fever; and as they are always most strikingly displayed in the progress of tubercular consumption, they will seldom fail, in conjunction with the local symptoms already enumerated, to afford evidence sufficiently decisive of the nature of the disease. There are some symptoms, however, which occasionally occur in the progress of con-

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* We have never seen this concomitant of phthisis, except in scrofulous subjects. That ulceration of the membrane is the natural sequel of inflammation, we hold as self-evident. Why this part should be so frequently found connected with a similar state of the lungs, we are not able to decide, unless we call in the aid of a general strumous predisposition, and probably the kindred feelings of membranous parts. In scrofulous subjects we sometimes find the other intestines similarly diseased, particularly the colon. P.

sumption, which require a separate notice. I may first mention that it is not uncommon to have, in the course of the disease, an accession of acute pleurisy, or of inflammation of the peritonæal surface of the liver. Further, as phthisis frequently supervenes on other diseases, its symptoms are sometimes so complicated with those of the primary disorder, that much discrimination is required in forming a judgment as to the true nature of the case. In many instances the symptoms of such diseases correspond very closely with those of phthisis; and this applies more especially to certain morbid states of the larynx and trachea, and to some obscure affections of the heart and great vessels. I have already alluded to the hoarseness which attends consumption, and to that sympathetic affection of the larynx which is so frequent in its latter stages.

Dropsy, particularly of the cellular membrane, is by no means uncommon in this disease. Œdema of the feet and ancles is sufficiently decisive of it, but it frequently extends also to the legs and thighs. This has commonly been attributed to *debility*, to that same relaxation of the capillaries to which we are in the habit of ascribing colliquative perspirations. But this theory is doubtful, because in many cases, where an equal, or even a greater degree of muscular weakness prevails, there is no appearance of dropsical effusion. I should presume it is simply referable to some unusual difficulty experienced in the transmission of blood through the lungs.

DIAGNOSIS.

The diagnosis of genuine (or tubercular) consumption from that state of thoracic disorder which we have called *vomica*, where no pre-existing disease of the lungs modifies the phenomena, and also from chronic inflammation of the *bronchia*, is a matter, often of great consequence, but as often of very considerable difficulty. Indeed, it baffles in many cases the skill of the most experienced physician. It is to be effected principally by a knowledge of the constitution of the patient and of his family predispositions; but much too may be learned by a close attention to the *progress* of the symptoms, and the order of their succession. A careful examination of the thorax should never be omitted. The degree to which the ribs can be elevated should first be ascertained, and percussion may then be practised on the different parts of the chest in succession. The clearness or dullness of the sound emitted affords an obvious and very useful test of the degree to which consolidation of the lungs has gone. Dr. Laennec of Paris was further of opinion, that a *variety* of sounds issued from the chest in diseases both of the heart and lungs, sufficiently permanent and characteristic to afford assistance in

diagnosis. To distinguish these, he invented an instrument called the stethoscope, the utility of which however is greatly lessened from the very long practice and the nice habit of discrimination which its employment is generally admitted to demand.*

PROGNOSIS.

It is unnecessary to treat formally of the *prognosis* in consumption. The common observation of the world has sufficiently stamped its character as the most destructive disease in this island,† and, in its confirmed stage, almost hopeless. The duration of the complaint, however, it is scarcely possible to define with any degree of accuracy; for a galloping and a lingering consumption are almost equally frequent. M. Bayle, speaking of the usual duration of phthisis, informs us, that out of 200 cases, 104 died within nine months. In many instances there are threatenings of the disease for several winters before the symptoms assume any degree of urgency.‡ They are often checked by the return of mild weather, but perhaps even in a still more remarkable manner, by pregnancy. The months of December and January are observed to be particularly fatal to phthisical patients. Sometimes they die from extreme weakness, exhausted by the discharge of pus, and the colliquative perspiration and purging; at other times more suddenly, suffocated by the accumulation of pus in the bronchia, which they are unable to expectorate; and in some rare cases, quite unexpectedly, by the rupture of a large blood-vessel in the lungs, the consequence of ulceration.§

The reader who desires further information concerning the stethoscope may consult Dr. Forbes's translation of Laennec's works. He will there also find useful and most accurate descriptions of the different varieties of thoracic disease, and of the morbid appearances which they present.

† The deaths throughout England by consumption are calculated at one in five, and amount therefore annually to about 55,000. They constitute one-fourth of the deaths in London, according to the bills of mortality.

‡ The danger of consumption is increased by various causes; 1. By the time of life. In the aged it is less certainly fatal. 2. That which proceeds from tubercles is more dangerous than that from hemoptysis or suppuration of the lungs: it is particularly dangerous in the last case, when the abscess breaks inwardly.† The degree of danger depends upon the number of tubercles; if they be few, and the patient advanced, the disease may continue for many years, without destroying life. C.

§ The contagiousness of phthisis pulmonalis has often been believed: in certain countries, as Italy and the Levant generally, it is thought to be certainly so: Morton and Morgagni were of that opinion. When we consider that inflammation is produced in certain mucous membranes, as in the eye by the contact of the matter of gonorrhœa, fluor albus, or the discharge of the Egyptian oph-

* See also p. 399 of this vol. † Thomas, p. 515.

TREATMENT.

It is melancholy to reflect how very little this disease is under the control of medicine; and before I can enter upon the consideration of the principles which are to guide us in its treatment, I must record the failure of every plan for its effectual cure, which human ingenuity has yet devised.*

The first principle which it appears of importance to inculcate is, that in phthisis active measures cannot be pursued; and that this must be compensated by a strict attention to a number of lesser circumstances, which in many other diseases may be neglected without detriment to the patient. We are to bear in mind, that consumption, though an inflammatory affection, is principally characterized by its occurring in a *scrofulous*, which is commonly a weak habit of body, and in an organ loaded with tubercles, the inflammation of which runs rapidly to suppuration. The chief objects of consideration, therefore, are, how these tubercles may either be absorbed, or kept in a quiescent state; in what respect their treatment, when inflamed, differs from that of common pneumonia; and how the constitution may be best sup-

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thalmia; that dysentery, which consists of an inflammation of the mucous membrane of the intestines, has been contracted from the use of the same close-stool with the sick; there can be no doubt but that the mucous membrane of the lungs may also be inflamed by the contact of certain irritating substances, and when such men as Van Swieten and those above mentioned have believed in it, it must at least be received with respect: Heberden also had some suspicions of it. Dr. Rush* relates the history of a contagious form of this disease, which spread over a plantation. In medicine it is a good maxim, to err on the safe side; precaution grounded on the above facts would lead us to avoid sleeping with the sick, as much for the purpose of avoiding the pernicious effect of bad air upon the system, and thus producing debility, as from the danger of consumption. C.

* M. Laennec considers that the consumption is a disease not so universally fatal as has been imagined. He relates ten out of many cases of the tubercular consumption which were cured. The restoration may take place in two ways; either by the ulcer becoming a fistula, which does not implicate the general health; or by a cicatrix of a cartilaginous character, formed by the approach and adhesion of the opposite sides of the cavity; Dr. Baillie states that after the practice of a long life, he has known only one or two cases of phthisis which recovered after they were fully formed; the recovery of course must depend upon the number of tubercles in the lungs, the inflammatory character of the habit, the regularity of life, the age, and in fact upon the absence or presence of all those circumstances which tend to hasten, protract, or increase the extent of tubercular formation. A man with one or two tubercles who also has arrived at the age of fifty may survive to the extreme period of human life, though his disease was certainly tubercular, but their extent was so limited as not to overpower the system by the sympathetic fever, the result of these tumors. C.

* Med. Inq. Vol. i. Oct. Phila. 1798.

ported in the protracted suppuration to which their inflammation leads. In the treatment of phthisis much nicety is required. On the one hand, we have to combat the actual presence of inflammation; and to bear in mind, on the other, the danger of exhausting the constitution.

The question has been frequently agitated, whether tubercles can be absorbed, and by what medicines that desirable object can be effected. Emetics have been recommended by some, the muriate of baryta by others; but though there is every reason to believe that tubercles have in some cases dispersed, yet this effect appears to be as completely out of our control, as the manner of their formation is beyond our knowledge. All that can reasonably be expected from medicine, is to keep them in a quiescent state; and this is to be done by a strict attention to diet, air, exercise, and by avoiding all those causes which we shall notice hereafter, as likely to bring on hæmorrhagy of the lungs.*

The diet of a person who has shown a disposition to phthisis, should be nourishing, and calculated to afford strength to the system, without creating a disposition to febrile excitement. For this purpose, farinaceous preparations of all kinds with milk should be recommended. Animal broths, with fish and a proportion of plainly dressed meat may also be allowed; but all highly seasoned dishes, and food which is difficult of digestion, and fermented and spirituous liquors are to be strictly prohibited.† Nothing appears more likely to correspond in every re-

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* Though the disease has been regarded as identical with scrofula, yet in the opinion of the best practitioners, Cullen among the rest, it cannot be cured by the remedies adapted to that disease: The muriate of barytes has been administered in the dose of five or six drops of its solution, thrice a day and gradually increased, without effect. When complicated with enlarged glands in the mesentery and an indurated state of the abdominal viscera, Dr. Wilson used mercury with good effect.* C.

† Consumption, like all other diseases which are difficult of cure, becomes frequently the basis of the pretensions of the empiric, and as physicians are often fond of playing upon the imaginations of the sick, it has in the diversified plans which have been proposed, frequently been made a mean of exciting attention in their favour; accordingly, whilst one attempts to blazen forth his own skill upon the faith of the credulous by extolling the virtues of abstinence, another goes to the other extreme, by crying aloud in favour of stimulating food, &c., both of which have been tried from time immemorial.

M. Salvadore of Trent, considering consumption as a disease of weakness, recommends copious meals of meat and wine, climbing mountains in the morning before breakfast, and when bathed in sweat, exposure to a hot fire to increase it.

Other practitioners have also recommended the stimulating plan; but we believe with the ordinary result, the undisturbed progress of the disease. Attention, however, to all circumstances which can alleviate the disease and support the system is necessary. C.

* Thomas, p. 259.

spect with this *indication of cure*, than the breathing a free and pure air; and its advantages in consumptive cases are generally acknowledged. The air of a large town, loaded as it is with smoke and effluvia, has long been considered hurtful. The patient should be sent therefore to the country; and, if possible, a situation selected, which is sheltered from cold bleak winds, and where the soil is gravelly.

To those whose circumstances will admit of it, we should advise the removal to a warm climate. Consumption, though far from being uncommon in the southern countries of Europe, is upon the whole, less frequent there than in cold climates; but between the tropics it is a disease nearly unknown. This consideration, were it not for the danger of the endemics of those countries, would induce us to prefer the Bermudas, or even the West India Islands, as a residence for consumptive patients. But even the South of Europe, particularly the climate of Naples, holds out many advantages; and a timely removal thither, with regularity of living, may be recommended to those who are *threatened* with consumption, with a fair prospect of overcoming the tendency to the disease.*

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* This point, and the utter hopelessness of success from the removal to a warm climate in the advanced stages of consumption, have been urged upon the attention of practitioners with much force, by Dr. H. W. Carter. See "*Remarks upon the Effects of a Warm Climate in Pulmonary Consumption and some other Diseases.*" Medical Transactions, vol. vi. 1820.

The same result is confirmed by the observations of others: Sir J. M'Gregor states that the air of Spain is salutary in the first and forming state of consumption, but in the latter periods that it hastens the fatal event.* Other observers have established the same truth. Besides the places mentioned in the text, Nice, Massa, Florence, Rome or Naples have been recommended: It is however now doubted whether these climates are proper; they all have their south and their north winds; and though they are situated in temperate latitudes, the vicissitudes are very great; the winds blowing from the Alps are in Italy particularly so. We think it therefore doubtful whether Italy is a proper climate for consumptive people; accordingly we find that lately Egypt has been recommended as a more fit place of resort for invalids of this description.

Dr. Thomas speaks favourably of the interior of England; Penzance in Cornwall also he thinks a proper place of resort; and in recommendation mentions the temperature as having in that climate a range of about 60 degrees. The moist air of England we should suppose quite unfavourable for patients of this description. The temperature of the southern parts of Mexico is described as being less variable than any other climate in the world. The want of the comforts of life, however, the removal from friends, from medical advice, privations for which the slender prospect of recovery cannot compensate, oppose the trial of foreign travel in this most unmanageable of all diseases. This opinion is now supported by the best authority. The air to which the consumptive remove should be dry, temperate, not subject to sudden changes, and the person should have the advantage of all the comforts of life. C.

* Sketch of the Med. Hist. of the British army. Vol. vi. Med. Chirurgic. Transact.

With the enjoyment of a free and pure air, moderate exercise should also be advised. A sedentary mode of life, and close application to study or business, have frequently proved the exciting cause of the disease; partly, perhaps, by the bent position in which the thorax is so long kept, but principally from the want of that due exercise which is essential to the preservation of the health and strength of the body. With the view of affording, at the same time, both exercise to the body and relaxation to the mind, a journey during the summer months is particularly useful.

When hæmoptysis has occurred, and when the symptoms warrant the belief that inflammatory action is going on in the lungs, measures of more activity must be pursued. Bleeding from the arm has been recommended as a means of putting an *immediate* check to the progress of the disease; but this is too often a vain hope; and blood-letting must, therefore, at all times be resorted to with caution, and a due consideration of the habit of body in which consumption occurs. Where the pulse is hard and contracted, and the pain and cough urgent, blood must of course be drawn from the arm, as in pneumonia, and repeated according to the strength of the habit, and severity of the symptoms. At any period of the disease, if pleuritic symptoms supervene, with a loaded state of the tongue, blood may be abstracted; and commonly a few ounces taken from the arm will be preferable to the application of leeches.

These symptoms appear generally in the first stage, accompanied by great difficulty of breathing, fixed pain in the side, heat of skin, dry, hard, troublesome cough, restlessness and uneasiness; Blood taken judiciously at this period, abates the fever; and should always be proportioned to the robustness of the patient, and to the violence of the disease.* The other antiphlogistic measures, of purging, the digitalis, with mild expectorants, nitre and antimonials should be used at the same time. C.

Blisters afford great relief to the cough and tightness across the chest, and they may be repeatedly applied with great advantage through the whole course of the disease. I have never seen sufficient benefit derived from issues and setons to warrant me in recommending them.† Active purging is inadmissible, but an

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* Thomas.

† The testimony of others is decidedly in favour of these remedies. Mudge cured himself by keeping constantly open an issue between his shoulders of 50 peas; the escar was three inches in diameter: he used at the same time a milk and vegetable diet:

Issues have been opened in the groins, hams, under the arms and between the shoulders and kept open by peas, and found to be highly useful.* This plan was used by the ancients, and there can be no doubt if applied extensively must be beneficial. Consumption has been arrested by the superventi on of other diseases, as abscesses; pregnancy as has been already stated sus-

* Bennet, quoted by Good, p. 521.

occasional dose of castor oil, or of rhubarb, will be found very useful. Mild diaphoretic and expectorant medicines may be exhibited frequently through the day. Attention to the state of the skin, indeed, is very necessary in this disease, as in every

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pends it, as also mania, facts which render probable the efficacy in this disease of extensive drains on the surface of the body.

Expectorants are to be regarded only as palliatives: and of these the demulcents, as the mucilage of liquorice, linseed, gum arabic, tragacanth are the best; they may be united with tartrite of antimony, squill, colchicum, ipecacuanha and the different preparations of opium, in order to quiet irritation, relax the skin and subdue the fever.

R. Mucil. glycirrhiz. ℥vii. Tinct. opii camphor. ℥ss. Vin. antim. tartrit. ʒiss. M. dos. ℥ss. cum tuss. urgeat.

R. Mucil. Semin. Lin. ℥vi. Oxymell. scill. ℥ss. Laudan. ʒi. M. ℥ss. cum urgeat tussis.

R. Mucil. gum arab. ℥vi. Vin. Ipecac. ʒii. Elix. Paregor. ℥ss. M. ℥ss. cum urgeat tussis.

The terebinthinates are also recommended, as copaiba, myrrh, and camphor. The copaiba has been given in combination with gum arabic in the dose of 20 or 30 drops, or upon sugar, at night. The Canada balsam, the balsam of Tolu, are also given: They have some effect in increasing the secretions of the lungs, and by some are believed to abate hectic. The myrrh forms the basis of the celebrated mixture of Dr. Griffith, which was given for allaying the hectic symptoms; the following is the recipe.

R. Myrrh. ʒi. terendo mortario cum Spirit. Piment. ʒvi. Aquæ Distillat. ℥viss. Dein adde Potass. subcarbon. ℥ss. Ferri sulphat. gr. xii. Syrup ʒii. m.

Dose. Take ℥ii. four times a day: if it should be too heating the spirituous water may be omitted, and the medicine given in a smaller dose: It may also be put up in the form of pills if it do not sit easy on the stomach.

Sulphur is also praised as an expectorant: Dr. Trotter recommends it highly in union with the Peruvian bark. The first is a very old remedy; it was given in early times with the yolk of an egg: Hoffman united it with diaphoretic antimony, and Videt with the dulcamara.†

The vapour of vitriolic æther has been prescribed for abating the cough by Dr. Pearson: a little æther is placed in a tea-cup and held near the mouth: it cools the surface of the lungs and promotes expectoration. Its efficacy is increased by dissolving cicuta in it.‡

It is in the incipient stage principally where the symptoms are inflammatory, that the digitalis promises to be useful; Notwithstanding the extravagant encomiums passed upon this medicine by its early friends, it is now regarded only as a palliative; It is given either in powder, infusion or tincture; in moderate doses thrice a day and gradually increased till it produces the diminution of the pulse, which is its characteristic effect; an infusion may be prepared in the following manner: To ʒi. of the dried leaves of digitalis add eight ounces of boiling water and strain it: Let it be given in the dose of ℥ss. to ʒvi. or it may be given in a decoction made as follows:

Boil two ounces of fresh leaves of purple foxglove in one pint of pure water down to ℥viiss. and add ℥ss. of tincture of cardamoms and mix them. Dose ℥ss. ter vel quater die.

The saturated tincture is made as follows:

Take five ounces of proof spirit, and add one ounce of the dried leaves coarsely powdered; Dose ten or fifteen drops thrice a day.

The use of the medicine often cannot be continued beyond a certain dose;

† Good's Study of Medicine, p. 523.
‡ Med. Repos. of New-York, p. 143.

other in which the lungs are implicated. An uniform temperature of the body should be promoted by warm clothing. In some cases it may be necessary, during the whole winter to confine the patient to apartments which are of a regulated temperature.

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in Dr. McClean's experience he could not exceed thirty drops of the tincture thrice a day; It should always be narrowly watched, as it produces palpitations, faintings, great debility, which may end in death: The pulse should always be felt lying down, as in that posture it often descends to 40, when in an erect one it may be even 100, and when sitting 75.

When digitalis produces debilitating effects a blister or sinapism should be applied over the stomach, and the patient should take the volatile alkali in doses of three or four grains every two hours, or the volat. spirit of ammonia in the quantity of ten drops at the same interval with some aromatic.

The treatment of phthisis when it assumes an inflammatory form has been various: M. Portal when it put on the form of catarrh mentions his having bled an old man three and four times: and Dr. Dover went even farther; Dr. Rush was also an advocate for active depletion in this state, also for salivation with emetics, nitre in large doses, and a milk and vegetable diet.

From the effect of the hardships of a military life effecting cures of this disease, as also riding in all weathers, our illustrious countryman believed that exposure to the vicissitudes of the weather was serviceable.* There can be no doubt, but that persons exposed to the air are less susceptible of its changes, for instance I have known a person who was subject to the pleurisy on every change of air, sleep in a camp exposed to a shower, and not be the least affected; on the contrary his susceptibility to this disease was entirely taken away: and I have also known the predisposition to cynanche tonsillaris completely eradicated by not wearing a neck-cloth: The boxers in England when training, are not susceptible of the changes of the air from frequent exposure to it; There can be no doubt therefore that a hard life in the open air in many cases may be of great use.

The prussic or hydrocyanic acid has like the digitalis the effect of reducing the pulse, and has been given in phthisis, but with little effect: I have tried it frequently in the hospital of this city but without any good result. Beginning according to its strength with the dose of the one-sixteenth of a drop it may be gradually increased. R. Acid. hydrocyanic. gtt. i. Aq. Distillat. ℥viii. m. Capt. ℥ss. cum urgeat tussis.

Distilled water must be used, as the salts in common water neutralize the acid: It must also be kept from the light; and I have observed that even with this precaution the bottle in which it is kept becomes brittle, and the acid loses its powers in about three weeks; most probably owing to the union of the potash of the glass and the acid.

Among the remedies of a sedative character may be here mentioned, hyosciamus, the hop, the conium, as substitutes for opium, which is necessary as a palliative in allaying irritability: Farther they have no power: The hyosciamus and the hop in the dose of half a grain of the former, and a tea spoonful of the tincture of the latter, have been given instead of the opium with good effect.

The conium in tincture with sulphuric æther has also been given by Dr. Duncan and found to be useful in abating the cough. The lactucarium is also praised by the same person.

As to narcotics as a means of radical cure they were largely tried by Dr. Roberts of St. Bartholomew's hospital, and he found that stramonium, belladonna, aconite, hyosciamus, and toxicodendron had no virtue whatever.†

The actæa racemosa has been recommended by Dr. Garden of Virginia: in a full dose it produces nausea, vertigo, pains of the extremities, dilatation of

* Rush, vol. v. 1802.

† Med. Trans. vol. iv. p. 129.

In consumptive complaints digitalis is universally employed. That its powers have been extravagantly over-rated, I cannot doubt; but it appears in some cases to quiet the cough, and to be an useful narcotic. In this view, I am inclined to think it preferable to conium, and even sometimes to opium. I have never observed any good effect to follow from pushing the doses of this medicine to such an extent as materially to affect the pulse.

In the confirmed stages of consumption, it is necessary to support the strength of the system by tonics; and the mistura ferri composita, in doses proportioned to the state of the system, is, perhaps, under all circumstances, the best form of tonic which can be recommended. In some cases, however, it seems to increase the febrile excitement, and to aggravate the cough and dyspnœa.* The sulphate of quinine may then be substituted: R. Quinin. sulphat. gr. ii. Infus. Ros. composit. ʒx. Syrup. aurant. ʒii. M. f. haust. quart. hor. bibend.

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the pupil, small pulse with great restlessness: It lessens arterial action and imparts tone to the system; It has been used by him in this disease with great success; how far it will answer general expectation is yet undetermined; it deserves a trial.*

Another plan mentioned by Mr. Roberts with more confidence is the exhibition of vinegar in the quantity of about eight ounces every twenty-four hours with as much rain water and sweetened with sugar; the diet at the same time being very slender and entirely vegetable, taking only about two meals every day: He states that it succeeded remarkably: This plan was introduced from Tunis in Africa, where it had been very successful: It produces costiveness, which is one of the most certain signs that it is likely to be successful.

Emetics have often been advised: I have seen good effects from the use of small doses of tart. emetic or ipecacuanha combined with chalk given every morning in doses sufficient to produce vomiting.

Dr. Maryatt advises the blue vitriol with tartar emetic in doses of two grains of each given twice a week; taking no drink for some time afterwards. Combined with the myrrh mixture of Dr. Griffith, this plan is praised highly: It is advised to give seven grains of ipecacuanha, with as much blue vitriol, in the morning fasting without drinking any thing afterwards. Dr. Senter states that by this means he has done more good than by any other. In France, emetic medicines have been given still more diluted; M. Lenthois states that by giving one-eighth of a grain of tartar emetic in a pint of water as the common drink of the patient he had a success, which as it is incredible it is unnecessary to mention. C.

* The use of certain mineral waters, as those of Bristol in England, has been advised in consumption; they are now generally abandoned, as being entirely useless: The exercise, amusements, the sanguine temperament of the sick, change of scene, &c. are no doubt the causes of the apparent benefit they produce: The high praises given to these waters are a proof of the uncertainty of medical evidence, particularly when those who give it are interested: It is now satisfactorily proved that notwithstanding the high encomiums on the subject of the Bristol waters, by the physicians of that place, a larger proportion of persons natives of Bristol die there than in any town in England.

Certain kinds of exercise have been considered particularly proper in this disease, as swinging, riding in a boat, making short voyages. The sea sickness

* Med. Record. vol. vi. p. 611.

Attention must chiefly be directed, in the latter periods of the disease, to the relief of urgent symptoms. The night sweats, which so greatly harass and weaken the patient, are in some degree checked by full doses of æther taken at bedtime. Cough may be alleviated by demulcents; diarrhœa by chalk, catechu, and aromatics. Both these objects will be promoted, with the additional advantage of procuring sleep, by the last resource of medical art, opium, and this valuable medicine should be freely given, increasing the dose regularly, so as to ensure to the patient the full benefits which it is capable of affording. Six grains of Dover's powder, with three of extract of hyoscyamus, made into two pills, may at first be given every night at bed time. Laudanum, or the liquor opii sedativus, may be administered at a later period, in combination with almond emulsion, chalk mixture, infusion of catechu, or with æther, subcarbonate of ammonia, and camphor julep, according as cough, looseness, or languor predominate: injections of thin starch with laudanum will be required when the diarrhœa is particularly harassing. R. Mucilag. amyli ℥viii. Tinctur. opii ʒi. M. f. enema astringens. *

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no doubt is useful. Exercise on horse-back, and a milk diet have long been celebrated and we believe deservedly in the early stages of this disease: Carriage exercise has also been praised by Sydenham; the experience of others, however, is not so favourable. With regard to the use of oxygen, hydrogen, azote and other factitious airs, earth bathing, stabling with cows, which for a time were highly praised, they are believed now to have no efficacy.

The inhalation of the vapours of tar, has been highly recommended by Dr. Crichton of St. Petersburg: a small vessel of tar is made to boil slowly over a spirit lamp, taking care that it does not burn; the vessel is cleaned, and the fumigation repeated in this manner three or four times a day: The heat must not be raised so far as to burn the tar; In order to destroy the pyroligneous acid ℥i. of subcarbonate of potash is to be added to every pound of tar.*

The vapor of aromatic herbs also immersed in hot water has been used to allay the cough; turpentine, styrax, frankincense, mixed with a small proportion of orpiment have been administered in the same manner: Dr. Eberle mentions a case of consumption which was cured from its lowest state by going into a bark mill (the tanner's) in the course of three months.†

*The uva ursi, the oak bark, the peruvian bark, claret, port wine, lime water, tar water, and pills made of tar have been advised to check the sweats and allay the hectic: as the disease itself is incurable it is of little use, excepting to palliate symptoms, to attempt any thing.

The old practice of Pringle in the more stubborn coughs, or in the first stage of consumption, when the patient complains of pain in his side, constriction at the breast, of hot and restless nights, is proper; It consisted of small and repeated bleedings, setons in the breast, and a low and cooling diet: he found the bleedings from 4 to 7 oz. repeated once in 8 or 10 days or oftener, not only useful in old coughs threatening consumptions, but also after hectic symptoms had appeared; the relief was not immediate on the first night after the blood was drawn, but on the second or third; he found the blood was constantly sizy; when it was dissolved, no more of course was taken away; and when the patient was weak,

* Thomas' Practice of Physic, p. 596. † Vol. i. p. 268.

scrofulous, or had long been ill, blood of course was not drawn at all: When there was thirst, heat and marks of fever, acescent aliments and drinks were useful: Butter-milk, milk and vegetables formed a good diet: Lime water and elixir vitriol, he used for checking the colliquative sweats, and the hectic he found much relieved by small bleedings: This plan of course is adapted, as Dr. Rush observes, to the inflammatory stage of consumption; when it becomes typhous, the most nourishing diet, with bark and other tonics, is absolutely necessary: Pringle at first used the balsam copaiba and peru in coughs depending upon an increased secretion, with irritability of the trachea and the lining membrane of the bronchia, with the discharge of a thin fluid; but upon more mature experience, he relinquished them; relying principally upon riding, vegetable and milk diet, a seton in the affected side and the free use of acids: Pringle advised the small bleedings also in hectic from other causes, as wounds, with the greatest effect.

When inflammation has subsided Baillie advises a little white fish or animal food at dinner; and in a few instances he has known wine (one or even two glasses diluted with water after dinner) to be useful, but wine is generally improper: The experience of this great man may be summed up in a few words; he has found a good deal of temporary advantage from myrrh, ammonia, and light bitters united to the acetic acid; the frequent repetition of blisters or a seton inserted under the skin in some part of the chest are also occasionally very useful. C.

CHAPTER XIII.

PERICARDITIS.

Pathology of the Heart—Inflammation of its investing Membrane—When first noticed—Symptoms of Acute Pericarditis—Prognosis—Diagnosis—Morbid Appearances—Causes—Metastasis of Acute Rheumatism—Treatment of Acute Pericarditis—Symptoms and Treatment of Chronic Pericarditis.

PATHOLOGY OF THE HEART.

There is scarcely a subject in the whole range of medical literature, which opens so extensive and important a field of investigation as the pathology of the heart. It has excited the attention of physicians from the earliest times; and in the elaborate dissertations of Morgagni concerning the morbid anatomy of the heart,* we see that every advantage had been taken of one means of arriving at a knowledge of this interesting branch of science. In the attempts, however, which were made to connect the diseased appearances of the heart, found after death, with the symptoms which occurred during life, the older pathologists unquestionably failed: and it has been reserved for our own times to infuse some portion of accuracy into this part of the inquiry. Much, however, still remains to be done; and though the difficulty of the subject must universally be admitted, still it does not appear to be, like some of the obscure and controverted points in the science of medicine, beyond the pale of legitimate investigation. These remarks apply equally to the acute and chronic diseases, to which the heart and its investing membrane are subject. The latter are very numerous, and constitute the different species of angina pectoris, to which our attention will hereafter be directed. The acute diseases of these parts will form the subject of the present chapter.

PERICARDITIS.

There is every reason to believe, that when the heart is in-

* Morgagni de Causis et Sedibus Morborum per Anatomen indigatis, lib. ii. epist. 16 ad 27.

flamed, the primary seat of disease is the pericardium. In one or two cases, indeed, the substance of the heart has been found inflamed, without a corresponding affection of the investing membrane; but the occurrence is so rare, that it will be sufficient in this place to have thus alluded to it. Inflammation commencing in the pericardium is, on the other hand, by no means unfrequent; and though it occasionally dips down a little way into the substance of the heart, still the character of the disease is the inflammation of a serous membrane, and the disease itself, therefore, is correctly denominated PERICARDITIS. Such a form of thoracic inflammation was acknowledged by many of the old nosologists; but their notions regarding it were very confused, and the most important circumstance in its pathology was altogether overlooked; I mean, its connection with acute rheumatism. The honour of this discovery is due to Dr. David Pitcairn, who first noticed the fact in 1788; and upon the strength of whose authority it was mentioned by Dr. Baillie in 1797. The first distinct account, however, which appeared in this country, of the disease since called *rheumatism of the heart*, was from the pen of Sir D. Dundas.*

We have seen three cases of this metastasis of acute rheumatism, two of which commenced in the intestinal muscles. We have found some symptoms that are not mentioned in the text. A small, tense pulse if pressed, but somewhat depressed and indistinct in its pulsations; and a sighing and constant restlessness with great mental anxiety, attended all the cases that have fallen under our notice. The embarrassed state of the circulation was probably owing to the affection of the muscular fibres of the heart. P.

Pericarditis is a primary, as well as a secondary disease; but the symptoms by which both forms of the affection are characterized are so similar, that it is unnecessary to separate their consideration.

SYMPTOMS.

Inflammation of the pericardium is ushered in, and accompanied in its course, by the usual febrile symptoms. The *local* symptoms are in some measure the same with those of the common forms of pneumonia; but such as peculiarly point out that the pericardium is the seat of disease, are the following. There is pain referred to the region of the heart, or more properly to the *scrobiculus cordis*, sometimes pungent as in pleurisy, but often described as a suffocating weight, extending to the right side. The patient complains of a violent *palpitation*, and the motions of the heart are often perceptible at a considerable distance. A strong pulsation of the carotid arteries, attended with noise of

* Medico-Chirurgical Transactions, vol. i, p. 37. London, 1809.

the ears and giddiness, is not an unfrequent symptom. The manner of the patient's breathing is to be attended to, as occasionally affording evidence of the exact seat of disease. It is often by catches, or starts; and the chest can generally be filled, though gradually. Dyspnœa is an urgent symptom, much aggravated by motion or exertion of any kind, so as to occasion an apprehension, on the part of the patient, of immediate death. There is usually present also, a short, dry, but incessant cough, aggravating the other symptoms, and frequently excited by pressure on the epigastrium. The pulse, which is always very frequent, bounds against the finger with a harsh jarring feel, at first regularly, but as the disease advances, irregularly both in point of force and frequency. The tongue is white, and the skin often bathed in sweat, as in acute rheumatism.

PROGNOSIS.

Unless some degree of relief is obtained, the countenance becomes livid, the eye glassy, and the patient sinks. Should the urgent symptoms only be palliated, the disease degenerates into the state of chronic pericarditis, the symptoms of which will presently be enumerated. Under more favourable circumstances, the patient gradually recovers; but, upon the whole, the prognosis is unfavourable as to ultimate and complete recovery. A quick pulse, and occasional palpitation, will always be found to remain behind, with a strong tendency to relapse; the recurrence of the disease being, if possible, still more dangerous than the primary attack.

DIAGNOSIS.

The diagnosis of pleurisy and pericarditis is often a matter of difficulty, although apparently there are sufficient symptoms already detailed to distinguish these diseases under every possible circumstance. The appearance of the countenance may sometimes be resorted to, in aid of the other symptoms. Common inflammation of the lungs frequently proceeds to a great extent, without a corresponding change of countenance; but in pericarditis there occurs, from the very earliest periods, a peculiarly anxious expression of the features, commonly with paleness. This symptom, however, fails as a diagnostic mark between this disease and acute bronchitis, which has often, I believe, been mistaken for it; but the error is fortunately of no practical importance.

MORBID APPEARANCES.

On dissection of those who die of acute pericarditis, the mem-

brane appears externally denser, and more opaque than natural, and numerous vessels are seen ramifying on its surface. On cutting into the sac of the pericardium, it is found gorged with serum, in which shreds of coagulable lymph are floating. Recent lymph will be found also covering the surfaces of the membrane; and in some places the heart and pericardium will, perhaps, be seen to adhere. The muscular structure of the heart in contact with the pericardium becomes much more crowded with vessels than in its natural state; and sometimes extravasated blood, or globules of pus, may be found dispersed through it. Along with these appearances, others are often noticed, denoting the extension of the inflammation to the diaphragm, pleura, or substance of the lungs.

CAUSES.

Cold, and the metastasis of acute rheumatism, are the only known exciting causes of acute pericarditis. One instance of the disease, with which I am acquainted, was obviously owing to the patient having slept on a pavement during a frosty night, while in a state of intoxication. Another I traced as distinctly to travelling on the outside of a coach, during a cold and rainy night. But it is unquestionable, that the extension or metastasis of acute rheumatism is by far the most common cause of inflammation of the heart. The circumstances which lead to this have never been very accurately investigated. In some instances, but by no means generally, the affection of the joints is relieved when inflammation attacks the heart. On the other hand, it has been found, that a fresh accession of inflammation has sometimes come upon the joints during the existence of active pericarditis. All periods of life are liable to inflammation of the heart, but it chiefly prevails between the ages of fourteen and thirty. Both sexes are in like manner its subjects, but I think it is most common among females. Persons of a broad chest and plethoric habit of body, appear to be those most particularly predisposed to it.

TREATMENT.

The treatment of acute pericarditis, supposing the disease to be ascertained with perfect accuracy, will not differ, in any material point, from that proper to be pursued in other cases of thoracic inflammation. Venesection must be promptly had recourse to, and pushed to a very considerable extent. Depletion is, for the most part, borne well in the early stages, and the blood is always highly cupped and buffy. Some degree of caution may be necessary when there is any considerable *intermission* in the pulse; but this symptom is by no means to deter us from the vigorous employment of the lancet, should it be called for by

others of an unequivocal character. Considerable benefit is often experienced in this disease from local blood-letting; and it has the advantage of being applicable, when the state of the system is unfavourable to further depletion from the arm. Fomentations in the first stages, and blisters at a somewhat more advanced period of the complaint, are exceedingly useful.

Purgative, saline, and antimonial medicines are to be freely exhibited. The combination of five grains of calomel with as many of antimonial powder, is well adapted for those cases in which venesection is ill borne. Some benefit is experienced from giving small doses of mercury, in combination with other antiphlogistic measures. For this purpose the following pill may be recommended: R. Pill. Hydrargyr. gr. ii. Pulv. antim. gr. iv. m. f. pill. Quaq. quart. hor. sumend. Digitalis is of some use; but care must be taken not to push its exhibition so far as to affect the pulse, and interfere with those symptoms by which we are to judge of the necessity of further evacuation. Opium, if advisable at all, should be given at night, in combination with ipecacuanha. Thus exhibited, it sometimes relieves the tickling cough, which is very harassing to the patient, and procures for him a few hours rest.

CHRONIC PERICARDITIS.

It has been already observed, that there is a state of *chronic pericarditis;* and we are next to enquire into the symptoms, progress, and treatment of this affection. Some differences of opinion have been entertained regarding the precise state of disease to which this term should be applied; and here I would, in the first place, give a caution to the student, as to the degree of importance which, in the present state of our knowledge, is to be attached to the distinctions among the chronic diseases of the heart, which pathologists have attempted to establish. It is seldom that they are observed to exist separately: and consequently their diagnostic symptoms have never been ascertained with that precision, which would warrant the expectation of their becoming applicable to practice. This observation will hereafter be illustrated when treating of angina pectoris, and the other structural diseases of the heart; but it is applicable also to the case of chronic inflammation of the pericardium.

Without wishing to deny altogether the pathological importance of that distinction between simple dilatation of the heart, and chronic inflammation of its investing membrane, which Mr. Burns has been at pains to inculcate,* I would apply the term

* See "Observations on some of the most frequent and important Diseases of the Heart." Edin. 1809, p. 58.

chronic pericarditis to that state of the heart which is very often left by acute inflammation of the membrane, and found after death to be connected with adhesion of the heart to the pericardium. Such a state of the heart is frequently accompanied by more or less enlargement of that organ; and it has been noticed that this is in the area of its cavities, rather than in the thickness of its muscular parietes. Complete adhesions of the heart to the pericardium have occasionally been found, without any previous symptoms of acute inflammation; nay, sometimes, I believe, without any evidence of disease at all. It appears that habit will, in many cases, reconcile the heart to a degree of restraint in its action, which at first may have been almost insupportable to it. When the adhesions are partial and long, Dr. Baillie is of opinion that little or no inconvenience may be felt; but when close, and extending over the whole surface of the heart, very considerable disturbance is generally produced,—so much indeed as sometimes to prove fatal.

SYMPTOMS.

The symptoms of chronic pericarditis are not always, it must be confessed, well defined; and many, even of those which are considered of most importance, are occasionally present in hysteria and dyspepsia; but still, in a great majority of cases, the diagnostic symptoms are sufficiently apparent. They are, a constant sense of oppression about the region of the heart, often, but incorrectly, termed *palpitation;* pain, sometimes in the situation of the heart, but more commonly referred to some distant part; pulsation in the epigastrium; and dyspnœa aggravated by the slightest exertion of the body, or any strong emotion of mind. To a person so affected, the climbing a pair of stairs, or the ascent of a hill, are insurmountable obstacles. At night the patient is disturbed by dreams of headlong precipices and rushing waters, or quick pursuit and impossible escape. The pulse is full, strong and jarring, and the whole frame appears to vibrate with the systole and diastole of the heart. In the worst cases dropsy succeeds.

The duration of the disease is very various. While it sometimes proves fatal in a few weeks or months, it is occasionally protracted even for years, and medicine has certainly considerable power in controlling this very formidable affection. It is satisfactory to know, that such symptoms as I have now detailed, have been in some instances completely subdued.

TREATMENT.

The following plan of treatment has been found efficacious,

and is consonant to general principles. It consists in keeping down the action of the heart by occasional purgatives, and a very light diet; in avoiding all severe exercise, and restraining, as far as possible, those emotions of mind which tend to hurry the circulation. A drain should be established in the neighbourhood of the heart, by means of a seton, which should be kept open for at least six weeks. Small doses of digitalis and calomel, in combination with extract of cicuta, have had a well-marked effect in moderating the pulse, and diminishing that general irritability of the frame, which a chronic state of disease in the heart commonly induces. R. Extract. conii, dr. i. Pulv. digital. Hydrargyr. submur. āā gr. v. m. and in pill. æq. xv. divid. Quar. sum. i. t. d. When from cold, or any other accidental cause, the symptoms become unusually severe, blood must be taken from the arm to the extent of eight ounces.

CHAPTER XIV.

PERITONÆAL INFLAMMATION.

Of the different kinds of Abdominal Inflammation—Characters of Acute Peritonæal Inflammation—As modified by the Structure and Functions of the Subjacent Viscus—Gastritis—Enteritis—Morbid Appearances from Acute Peritonitis—Causes—Diagnosis—Prognosis—Treatment—Symptoms and Progress of Chronic Peritonitis—Morbid Appearances—Treatment.

OF THE DIFFERENT KINDS OF ABDOMINAL INFLAMMATION.

In the abdomen, a variety of structures are met with, all of course subject to inflammation. These it will be necessary briefly to notice before the several kinds and characters of abdominal inflammation can be justly appreciated. There is in the first place, the peritonæum, the most extensive serous membrane of the body, lining the viscera and the muscular parietes of the abdomen. Whatever portion of it be primarily attacked, the general characters of the inflammation remain the same, receiving only some slight addition or modification from the structure and functions of the subjacent viscus. It is to Bichat we are indebted for our present notions of the general nature and modifications of peritonæal inflammation. They had formerly been confounded with diseases, commencing in the organs invested by this membrane. Bichat first pointed out, as an important principle both in pathology and practice, that a morbid state of the peritonæum was compatible with, and frequently attended by, a healthy state of the parts which it covers. This principle had been partially known before, but never distinctly avowed, or thoroughly investigated.

The second of the structures within the abdomen, is the parenchyma of the solid viscera; and the third is the mucous membrane of the intestinal canal. The inflammatory affections of each of these parts will require a separate consideration.

The peritonæum is subject to two kinds of inflammation, the

acute and chronic, very distinct from each other in their character and progress. The acute form of peritonæal inflammation is that to which my attention will first be directed.*

ACUTE PERITONÆAL INFLAMMATION.

This disease begins with rigors, a quickened pulse, and other marks of fever. From the commencement it is usually attended with its characteristic symptom—pain of the abdomen, increased on pressure; but it will occasionally be observed, that pain of the back is chiefly complained of for the first four-and-twenty hours. In some cases, the invasion of the disease is sudden, and the pain becomes in a short time almost intolerable. In others, the advance of the disease is more gradual, and the pain is felt only on pressure. At first, it is commonly confined to one spot, more particularly to the navel, but by degrees it extends over the whole abdomen. With very few exceptions, indeed, the pain of peritonæal inflammation is constant. The pulse is about a hundred in a minute, varying however very much in character, but for the most part contracted, and hard, or wiry. There is great thirst, and the tongue is covered with a cream-coloured mucus. The abdomen is swelled and tense. The patient lies on his back, and frequently complains even of the weight of the bed-clothes. Peritonæal inflammation may exist with every possible state of the evacuations. If severe, and suffered to proceed, it usually proves fatal between the seventh and tenth day; the countenance collapsing, the pulse becoming very indistinct, and the extremities cold.

On dissection, the peritonæum generally, or in some of its parts, will be found minutely injected with blood, the convolutions of the bowels loosely glued together, and serum (in which flakes of lymph may be observed floating), or sometimes pure pus, in considerable quantity, effused into the cavity of the abdomen. Ulceration of the peritonæum has been met with, but it is a rare appearance. The intestines are occasionally distended with air, constituting tympanitis.

MODIFICATIONS.

Such is the general character of peritonæal inflammation, whether the omentum, or the mesentery, or the surfaces of the different solid and membranous viscera, or that portion of it which lines the muscular parietes of the abdomen, be the chief

* In this and the two following chapters, I have derived the greatest assistance from Dr. Pemberton's "Practical Treatise on various Diseases of the Abdominal Viscera." London, 1806.—This useful work should be in the hands of every student.

seat of disease. Its symptoms are in some respects modified by the structure and functions of the subjacent viscus; and these modifications have been assumed by all nosologists, as the groundwork of a subdivision of this affection into several species. It is certainly a curious circumstance, considering the tendency to spread, which the inflammation of membranes, both serous and mucous, generally exhibits, that peritonæal inflammation should sometimes be so completely confined to one portion of its extent, that these nosological distinctions become applicable in practice. The particular symptoms which characterize inflammation of the capsule of the liver, will be best explained when the corresponding affection of the parenchyma of that organ comes under review. For the present, therefore, I confine my attention to the symptoms of Gastritis and Enteritis. The inflammation of the omentum, mesentery, and peritonæal coverings of the spleen, pancreas, uterus, and bladder, offer no phenomena of any particular interest.

GASTRITIS.

Gastritis is a very rare disorder; and the few cases of it on record are primary inflammations of the mucous, and not of the peritonæal coat of the stomach. The symptoms usually attributed to inflammation of the peritonæal coat of the stomach are an acute pain, and sense of burning heat in the epigastrium, vomiting, increased by the mildest ingesta, extreme debility, a remarkable anxiety of countenance, and delirium.

ENTERITIS.

Inflammation of the peritonæal coat of the intestines, or *Enteritis*, is, on the other hand, the most frequent of all the forms of peritonæal inflammation; and it is also the most dangerous, and the most rapid in its progress. It has been known to prove fatal in four days. Besides the symptoms already enumerated as characterizing peritonæal inflammation generally, enteritis is distinguished by great prostration of strength, restlessness, a continual tossing of the arms, nausea, and vomiting, an expression of great anxiety in the countenance, and *costiveness*. This last symptom, though not constantly, is yet so generally met with in cases where the peritonæal surface of the bowels is *primarily* affected, that it may be looked upon as one of the diagnostic marks of the disease. Where peritonæal inflammation however occurs in the course of typhoid or other fevers, diarrhœa is generally observed to prevail. In enteritis the pulse is often very obscure, but generally quick, hard, and incompressible. The tongue is white, with a streak of brown fur down the middle. The pain, which is usually referred to the navel, is aggravated occasionally in pa-

roxysms, probably from spasmodic contractions of the muscular coat of the bowels. In the worst cases, delirium comes on about the sixth or seventh day (seldom earlier), and death speedily follows.

The extreme feebleness of the pulse, the coldness of the extremities, sunk features, hiccup, and other marks of failure of the powers of life, which occur in the last stage of enteritis, are often said to denote that gangrene has taken place; but in a great number of instances, these symptoms occur without the slightest trace of gangrene being discoverable on dissection. Sufficient cause of death is to be found in the *extent* and *violence* of inflammatory action. When gangrenous spots do appear, it is supposed by some pathologists that the inflammation has spread to the muscular structure of the intestines.

CAUSES.

Acute peritonæal inflammation occurs to all ages,* and at all seasons of the year. Cold, combined with moisture, is presumed to be its most common exciting cause; but enteritis has not unfrequently been brought on by causes applied more directly to the membrane itself; such as a full meal of high-seasoned food, intemperance, and accumulation of hardened fæces. It has been often aggravated, perhaps even actually induced, by strong, and especially *spirituous* cathartics. In some instances it has been owing to causes which no prudence could avert; such as intussusceptio, morbid elongations of the mesentery and omentum strangulating a portion of intestine, and a wound of the bowel in the operation of tapping. There is a particular species of peritonæal inflammation, which occurs to women after child-birth, and is generally known under the name of *puerperal fever*. Whether the local disease be primary or secondary, is still a matter of doubt; but there is every reason to believe that the affection, whatever be its nature, is contagious, and communicable by the clothes of the practitioner. Though sometimes fatal, it is seldom so severe, or so rapid in its progress, as common peritonitis.

DIAGNOSIS.

The only diseases with which I have ever seen peritonæal inflammation liable to be confounded are, colic, and affections of the kidney, probably from calculus. In regard to colic, it must be borne in mind, that peritonitis has, in some cases, succeeded violent attacks of the colic; and the possibility of this conversion

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* A distinct case of peritonæal inflammation, occurring in an infant a week old, and proving fatal on the fifth day, is recorded by Dr. Garthshore, Med. Communications, vol. ii. p. 44.

should never be lost sight of while engaged in establishing the diagnosis. Colic is distinguished from peritonæal inflammation by the absence of fever, by the pain occurring in paroxysms, with occasional intervals of complete ease, and by its being alleviated, rather than increased on pressure. With respect to affections of the kidney, I have seen them attended with severe and constant pain of the whole abdomen, costiveness, nausea, and vomiting; but the pulse was slow in these cases, and pressure on the belly did not aggravate the pain.

PROGNOSIS.

The general prognosis in peritonæal inflammation, particularly in enteritis, is, upon the whole, unfavourable. The disease, it is true, is very much under our control at first; but if neglected, even for twenty-four hours, the mischief is sometimes irremediable. The sequelæ of the disease too are very formidable—agglutination of the bowels, dropsy, and a tendency to relapse. The particular prognosis is to be regulated almost entirely by the *extent* of pain. When the boundaries of the inflamed portion of membrane can be ascertained, judicious measures will probably save the patient. In weakened habits, when the *whole surface* of the membrane is affected, recovery is almost hopeless. To have procured a free passage of the bowels is, of course, a favourable symptom; but it is very far indeed from being decisive as to the subsidence of inflammatory action.

TREATMENT.

When the disease is once ascertained, the treatment is sufficiently simple. Purgative medicines are not to be given at first, while active inflammation is going on; but blood is to be taken from the arm to the extent of at least sixteen ounces; and if the pain on pressure continue unabated, this should be repeated in six or eight hours, before any attempts are made to open the bowels by medicine. In very urgent cases, it is advisable to place the patient in a warm bath, and in that situation to open a vein. The abstraction of a quantity of blood is thus rendered not only more effectual, but more *certain*. It was long ago observed, that the blood does not always appear buffy in the early stages of enteritis. No reliance therefore can be placed upon this symptom. Nor is the practitioner to be deterred by the marks of *oppression*, or apparent exhaustion, which often occur in the outset of the disease. The pulse commonly rises as the system is freed from the load which oppresses it. In addition to bleeding at the arm, or sometimes as a substitute for it, particularly where the seat of pain is limited, or when the strength of the patient is likely to fail, ten or twelve leeches may be applied to the

abdomen. They sometimes give great and immediate relief. A blister should not be applied until a later period of the disease. The practice of applying a blister, in all cases of local pain, without due regard to its cause, cannot be defended. In peritonæal inflammation it is particularly hurtful, as it takes away our best guide in the administration of other remedies. Warm fomentations are greatly preferable in an early stage of the disease, and should be applied diligently on any return of pain.

Inflammatory action must mainly be subdued by the measures now alluded to. Internal medicines however are not to be neglected, and mild laxatives, in small and frequently repeated doses, are the most useful. Castor oil and Epsom salts, or the infusion of senna and tamarinds of the Edin. Pharm. may be mentioned as well adapted to the circumstances of this disease. If the stomach is very irritable, and rejects medicine in the fluid form, small doses of calomel, in union with the extract of hyoscyamus, will sometimes be retained, and prove useful. Frequent emollient glysters are very serviceable, and should never be neglected. Effervescent draughts may also be tried. A tobacco injection has been mentioned as affording some chance of relief, but it cannot be recommended.

CHRONIC PERITONITIS.

Chronic inflammation of the peritonæum is not unfrequent, and there is very considerable uniformity in the symptoms and progress of the disease. Its advances are very insidious. Occasional pricking pains over the abdomen, with a quickened pulse, and coated tongue, give the first evidence of disease. The pain, or *tightness*, of which the patient complains, is occasionally aggravated in paroxyms of great violence. This tendency to periodical exacerbation in the pain, is an important index of chronic peritonæal inflammation. The pulse remains steadily above 100, and is often full. During the early stages of the disease, the patient continues his ordinary occupations, but complains always of an increase of pain or soreness across the abdomen, from fatigue. There is thirst, and want of sleep and appetite. As the disease advances, the features appear sharp and contracted, and the countenance pale, sallow, or doughy. The tongue is either of a bright red colour, or covered with a thick mucus. The taking of food creates much uneasiness, particularly a sense of weight in the abdomen. There is no considerable tension in common cases, but a degree of hardness in the viscera may often be distinctly traced. Costiveness usually prevails, nd increases very considerably the distresses of the patient. I have seen this go on to perfect *ileus* (stercoraceous vomiting). Great

emaciation and debility succeed, and the patient ultimately dies hectic, and exhausted. The duration of the disease varies from three or four to twelve months. It is full of danger. I have seen but one case recover where the symptoms were strongly marked. Relapses are to be dreaded, even though a diminution of the pulse, and of pain, should indicate a degree of improvement.

MORBID APPEARANCES.

On dissection the peritonæum appears discoloured, and often thickened to a great extent. Tuberculated accretions of different forms are found attached to it, sometimes appearing like bunches of grapes. The convolutions of the intestines are matted together, and often form with the liver, omentum, and other viscera, a mass in which it is scarcely possible to distinguish one part from another. In many cases there is an effusion of dropsical fluid, and occasionally of purulent matter, with or without ulceration of the peritonæal membrane. The subjacent viscera are sometimes perfectly healthy.

The disease for which chronic peritonitis is most liable to be mistaken is ascites, or ovarial dropsy (an accidental, and by no means frequent symptom, being looked upon as the primary disease). Several persons have been tapped for this complaint. A few pints of water are perhaps discharged, but without affording any relief to the sufferings of the patient.

The causes of this affection are involved in great obscurity. I have seen it occur as a consequence of common fever; but it is doubtful, if that hardness of the abdomen, which is occasionally met with in convalescence from typhus, and recovered from, is really attributable to chronic peritonæal inflammation. All ages are subject to this disease. In children it is by no means uncommon, and it constitutes one of the forms of *marasmus*, as I shall hereafter more fully point out. It appears to be connected at that period of life with the scrofulous diathesis; and I have noticed, as a peculiarity of the disease when so occurring, that erosions take place of the peritonæal and mucous coats of the intestines, by which a quantity of matter, which had been formed by the diseased peritonæum, finds its way into the intestine, and is discharged by stool. This form of the affection I have ventured to call the scrofulous inflammation of the peritonæum.*

TREATMENT.

The method of treatment in chronic peritonitis is very little understood, but the following plan offers the best prospect of

* See Medico-Chirurgical Transactions, vol. xi. p. 258.

success. Topical bleeding, to the extent of six ounces, may be directed twice in the week, while the sensation of pricking pain continues. Sometimes I have found it necessary to bleed from the arm. Without free alvine evacuations, the distress becomes quite insupportable; but large quantities of purgative medicines, which are sometimes given under the idea that the disease consists only in fœculent accumulations, are decidedly prejudicial. Some gentle mercurial preparations, and blisters may be tried. In one case, I thought benefit was derived from digitalis. A light diet of milk and vegetables should be strictly enforced. Opium is often indispensable in the latter stages of the disease.

CHAPTER XV.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE ALIMENTARY CANAL.

Liability of this Membrane to Inflammation, both Acute and Chronic—Aphthous Diarrhœa of Children—Inflammation of the Mucous Membrane of the Stomach in Adults—Of the Mucous Membrane of the Small Intestines in Adults—Of Dysentery—Its Causes—Symptoms—Morbid Appearances—Treatment—Symptoms and Treatment of Chronic Dysentery.

LIABILITY OF THIS MEMBRANE TO INFLAMMATION.

The pathology of the mucous membrane of the alimentary canal is a subject of great extent and importance, but it has not yet been investigated with all the accuracy which it deserves. While some parts of it are well understood, others are involved in a degree of obscurity which it will require a long course of observation to clear up. One of the most obvious of its general principles, is the great liability of the membrane to inflammation. Such an affection occurs both in an acute and chronic form,—as idiopathic, and as supervening on other diseases,—in adults, and in children. There appears to be a peculiar tenderness and susceptibility of inflammation in this membrane during the first years of life, and this points out the great importance of regulating the diet of children with the most scrupulous care.

The mucous membrane of the intestinal canal, as has been remarked by Dr. Baillie,* is more disposed to become *ulcerated* than any other membrane of similar function in the body. It is difficult to assign a satisfactory reason for this; but it probably depends on some minute difference of structure. There is a good deal of resemblance, observes this author, between the structure of the inner membrane of the trachea, and that of the urethra, and their secretions likewise are not very different. The inner membrane of the intestines, however, has a structure and secretion peculiar to itself.

* Morbid Anatomy, 5th edit. p. 169.

As a general principle it may be stated, that inflammation occurring in any one part of the mucous membrane of the alimentary canal, is apt to spread to others. Thus it is, that when we observe aphthæ in the mouth, we may expect, on dissection, to find ulceration of the ileum. But it is to be observed, also, that the appearances of inflammation are in some cases confined to one portion of its extent. It is not uncommon, for instance, to find ulceration of the ileum terminating by a distinct line at the valve of the colon, and the mucous membrane of the large intestines altogether free from disease. I shall now describe, very briefly, the symptoms and progress of the inflammation of the mucous membrane of the intestines, as it occurs at different periods of life, and in different parts of the membrane, but without pretending to fix, with any degree of accuracy, the precise portion of it occupied by the disease.

APHTHA.

Infants are subject to an inflammatory affection of the mucous membrane of the alimentary canal, generally classed as a species of diarrhœa, but known also by the name of aphtha, or *the thrush*, from a symptom which attends it in one of its stages. It chiefly occurs between the fourth and eighth month, and among such as are fed wholly or partially upon spoon-meat. There is reason to believe, that it is always connected with an improper diet. It is characterized by vomiting, fœtid eructations, and pain, apparently referred to the epigastrium; tormina, diarrhœa, and some degree of tenderness of the belly on pressure. The stools are green, and slimy, or tinged with blood. Frequently they are ejected with great force. As soon as any food is taken into the stomach, the child has a motion, giving the appearance as if it passed immediately through the bowels. As the disease advances, the tongue becomes red; the mouth is covered with aphthæ, and the verge of the anus appears inflamed. The brain also becomes affected, illustrating that important pathological principle which I had occasion to allude to, when treating of the diagnosis of hydrocephalus. The child is frequently drowsy before the aphthæ appear. This symptom is vulgarly called sleeping for the thrush. Coma is occasionally observed to come on towards the termination of the complaint. The infant rapidly emaciates.*

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* Uneasiness, restlessness, anxiety, disturbed and diminished sleep, paleness, and emaciation are the symptoms which precede this disease: The aphthæ are white specks, like broken curds, on the surface, covering a great part of the mouth, œsophagus, and alimentary canal; they consist of whitish exudations, or, as some say, eschars, on the internal parts of the mouth, running together, and often very numerous:* Sickness, hiccup, oppression, convul-

* Philip, vol. i. p. 315–6–7.

This disease is a true inflammation of the mucous membrane of the bowels. On dissection there appear, in various parts of the inner surface of the intestines, particularly the ileum, irregular patches of inflammation, slightly elevated above the surrounding parts, and often covered with minute vesicles and ulcers.* It often proves fatal in a short time, and requires, therefore, great attention in its early stages. The treatment should be begun by an emetic, consisting of four grains of ipecacuanha. Small doses

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sions, watery gripes, and pain referred to the stomach, with much debility, occur when the disease attacks the internal parts; aphthæ vomited up also show the same thing. When the aphthous crusts ascend from the œsophagus there is great danger:* The colour of the crusts afford a prognosis with regard to its fatality; they are at first white, which shows a safe state of the disease, and afterwards they become brown or black; When they are from the first of a brownish colour, the prognosis is bad; a black colour is at all times dangerous, as it shows a weakened action of the blood-vessels, preceding mortification; The successive crops of the disease appearing crowded, also show a dangerous state, in proportion as they are thickly distributed: One crop falling off and another continuing is more safe than the same remaining constant;† as it shows an intermittent and weaker condition of the system. When they fall off early, and are not succeeded by another crop, it is still more favourable; The reappearance of the aphthæ is rendered improbable by the clearness, the redness, and moisture of the surface on which they appeared; but if on the contrary they are black, dry, and foul, we may expect a re-appearance of the eruption; always those aphthæ which fall off soonest are the safest: When the new crop of aphthæ comes out before the old one is thrown off, the number in consequence is greatly increased, and of course the danger; and when after the aphthæ have been thrown off great marks of debility appear, and the eruption does not come out, the prognosis is also bad: A white pearly appearance of the aphthæ, followed by a clean, red, and moist state of the pustules, and the abatement of the symptoms, shows a favourable state of the case; on the contrary, a brown or blackish appearance of the ulcers portends great danger.‡ The more the aphthæ spread downwards, the worse is the prognosis: When the aphthæ fall off the surface of the mouth, it remains in an excoriated state, and a salivation or a diarrhœa occurs; a moderate diarrhœa is often useful; but where it becomes considerable it occasions a relapse by the weakness it occasions:§ The taste, which is nearly lost before the removal of the aphthæ, returns in an increased degree on their removal:‖ It is believed that the deficiency of perspiration produces the aphthæ, as Sydenham states that in those fevers, in which he observed this eruption, this was the case: It is said, that they appear more frequently in cold than in hot climates on this account, and that they are rendered milder by sweating: This eruption attends dysentery, the last stages of phthisis, dropsy, and scurvy: It is produced by cold and moisture in its idiopathic form, and more particularly in marshy situations; the concurrence of other causes, however, is necessary, as a derangement of the primæ viæ, bile, worms, bad milk, particularly that of a drunken nurse; anxiety, violent passions, or any thing that disturbs the the nurse's health, produce the same effect: Sometimes, however, all these causes operate without producing the disease. C.

* Philip, vol. i. p. 316. † Ibid. ‡ Ibid. 318—19. § Ibid. 321. ‖ Ibid. 324.

* Vide Dr. Abercrombie, on the Pathology of the Intestinal Canal. Ed. Med and Surg. Journal, July 1820, p. 326. A valuable paper, from which I have derived much useful information.

of castor oil, or of rhubarb and magnesia, should then be given frequently, while the urgent symptoms continue.* Mucilaginous and anodyne injections may be thrown up, with the view of sheathing the lower parts of the inflamed membrane.

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* There are two observations to be made on the exhibition of purgatives; they must not be given whilst the aphthous crust adheres to the bowel, and the surface is raw and excoriated, but are to be used in the commencement of the disease, and in its decline, when the aphthæ are beginning to fall, and are passed by stool; as they produce by their putrefaction a new train of morbid symptoms: When they have begun to fall it is necessary to wait 24 hours, till the parts they occupied become clear and moist, then cathartics are safe.* With regard to the use of an emetic it is proper, from the cause being more frequently seated in the stomach, and from its effect in exciting perspiration; it should not be repeated, as it may produce hæmorrhage, ulceration of the stomach, and death; With regard to venesection, it is seldom necessary; it may be prescribed in small quantities should symptoms of inflammation appear; but as debility is principally to be dreaded, it should be used with caution, and in most cases not all.† If the case should incline to typhus, the patient should take cordials; as wine, and aromatics sweetened, with bark in decoction, or the serpentaria, or the sulphate of quinine: The decoctions of turnips, of radishes, or their expressed juice mixed with water and sweetened with honey, given in the quantity of a dram or two every half hour, are recommended as applications to the internal fauces; Small beer or ale sweetened with sugar; veal broth boiled with rice and bruised turnips are also recommended; the last has the advantage of being nutritious.‡ Dr. Armstrong recommends a solution of sulphate of zinc in the proportion of half a scruple to eight ounces; a dram of this solution swallowed every now and then has a good effect in cleansing the bowels: Borax mixed with sugar or honey is recommended in the proportion of one part of the former to seven of the latter; a pinch of it, when made with sugar, is put upon the tongue, and soon diffuses itself over the whole surface of the mouth; When honey is used it is equally effectual; the proportion of two scruples or a dram of the former to an ounce of the latter, may be applied to the mouth without giving the least pain:§ The practice of rubbing the internal parts with a rag tied to a stick gives pain, and irritates, and does no good. The borax and honey, Underwood states, removes the aphthæ completely, and in a very short time: The idea that a retrocession of the eruption is attended with danger, and is often produced by these applications, is without foundation: It is the result of the debilitated powers of the system, and the recession of the eruption is nothing more than a symptom of that state; to relieve which cordial remedies are absolutely necessary, both when the aphthæ assume a dark colour, or when any other marks of debility are seen. The decoction of the bark, after carefully cleansing out the bowels, by the gentlest cathartics, as rhubarb with magnesia, or carbonate of soda, should be freely given, or what will be better, the same medicines in union with sulphate of quinine; The sulphuric, and muriatic acids, are also found to be of the greatest use: When the bowels are too loose and debility is likely to result, it is necessary to use astringents, as logwood, alum, and port wine, and antacids. There is a variety of this disease described by Underwood, under the name of aphtha gangrenosa, in which the whole symptoms are typhous; it deserves notice here only to state that he considers it as communicated by the breath: Cleanliness should be observed by the attendants and the patient, and the tonic plan rigidly enforced; It is treated generally upon the above plan. C.

* Philip vol. i. p. 333. † Ibid. p. 333—4. ‡ Ibid. p. 336.
§ Underwood, vol. i. p. 79. London, 1819.

A warm bath is frequently serviceable. Great attention should be paid to the diet of the child, which must consist altogether of milk, or of the lightest farinaceous preparations.

An affection, very similar to the preceding, is met with in children from the period of weaning, as late as the fourth or fifth year of life, and even later. It is attributable, I believe, in most cases, to an improper course of diet; very often to a diet composed of a larger proportion of animal food, than the stomach, at that age, is capable of digesting. It is of a more chronic nature than the *aphthous diarrhœa* of infants at the breast. It frequently goes on to complete emaciation, and it constitutes, in fact, one of the forms of the atrophia of children,—a disease which has received the various names of tabes mesenterica, marasmus, and infantile remitting fever.

On dissection, in these cases, the mucous membrane of the bowels is found extensively ulcerated, and the mesenteric glands more or less enlarged; but this last appearance is probably dependant on the former. Whether there is a disease of the mesenteric glands, primary, and independent of disease in the intestines, and how far it may be looked upon as a frequent occurrence, are points in pathology which do not appear to have been hitherto very accurately investigated.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE STOMACH.

The mucous membrane of the *stomach* is liable to be affected by inflammation, in consequence of acrid matters swallowed. It has been supposed, that arsenic proves fatal by bringing on inflammation of the stomach: but Mr. Brodie has shown the incorrectness of this as a general proposition. In some cases, indeed, there can be little doubt, that, after a certain time, inflammation of the mucous membrane of the stomach does come on in consequence of arsenic; and the case published by Dr. Roget* may be brought forward as an instance; but even here, the symptoms of high nervous irritation predominated greatly over those of the local inflammation. Dr. Baillie states,† that on dissection, an extreme degree of redness then appears in the inner membrane of the stomach. Portions of it are sometimes destroyed, and occasionally a thin layer of coagulable lymph is thrown out. Such appearances however cannot be relied on as proofs of poisoning.

Jalap and other violent medicines; corros. sublimate; nitre in large doses; oxalic acid, ardent liquors; oil of vitriol; excess of food, and indigestible substances, have produced it.

* Medico-Chirurgical Transactions, vol. ii. 1811.
† Morbid Anatomy, page 147.

Cold water taken internally, when the body is heated; repelled gout, and colic have also been its causes.

The symptoms of this form of inflammation of the stomach are frequently obscure; it often indeed exists without any evident sign.

Sometimes the inflammation spreads into the œsophagus and into the whole internal surface of the mouth; if at the same time the stomach is very sensible to acrid medicines, with vomiting, pain, want of appetite, thirst, and a frequent pulse, there can be no doubt that inflammation exists.

It is to be treated by washing all acrid matters out of the stomach by diluents; and abating the re-action by venesection, and blisters to the epigastrium; the patient is to be kept quiet, and after the system has been reduced, laudanum to allay its irritable state, will be found to be valuable. It often extends into the bowels, producing diarrhœa. Cubebs, combined with cayenne pepper, or with balsam copaiva, succeeded perfectly in curing it in the practice of Mr. Fosbrooke. C.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE SMALL INTESTINES.

Inflammation of the mucous membrane of the small intestines occurs in *adults*, both as an idiopathic affection, and as symptomatic of other diseases,—in an *acute* as well as chronic form. The symptoms by which it is characterized are not always very distinct; and hence it is, that the disease, though by no means uncommon, has hitherto remained without any appropriate designation from nosological writers.*

It is attended with a diffused soreness over the whole abdomen, rather than with pain. This is sometimes increased on pressure, but never to the extent that prevails in peritonæal inflammation. There is no considerable tension in the belly. The pulse is quick, with thirst, *languor*, and considerable febrile oppression. By these symptoms we distinguish *inflammation* of the mucous membrane of the bowels, from that state of *irritation* of the membrane, which exists in common cases of diarrhœa; but it must never be forgotten, that the two states of disease are closely allied, and, in fact, run into each other by insensible degrees. The tongue is *red, and smooth*, and eruptions take place about the lips. Vomiting is frequently noticed, with loss of appetite, indigestion, and irregularity in the alvine evacuations. Diarrhœa is almost universally present; the stools are slimy, and tinged with blood. In severe cases, pure blood is occasionally passed in considerable quantity. An increased secretion of mucus from the intestines constitutes one of the principal features of the disease. It must be confessed, however, that in the appearance of the evacuations there is considerable diversity. In some instances inflammation exists to a considera-

* It has sometimes been called the intestinal catarrh. *Enteritis Mucosa* is perhaps its legitimate denomination.

ble extent, while the motions differ but slightly from those of common diarrhœa. Nothing perhaps more strikingly distinguishes this complaint than that degree of morbid irritability of the whole intestinal canal, by which food, even of the lightest kind, or a little cold water taken into the stomach, stimulates the rectum to immediate contraction.

The disease is always tedious, but not commonly fatal. It occasionally proves so, with or without supervening peritonæal inflammation, or it passes into a chronic state, in which the patient at length sinks exhausted. The chronic form of the affection is marked by pain of the abdomen, diarrhœa alternating with costiveness, increasing weakness and emaciation, hectic fever, and a tongue præternaturally red, or aphthous. It is certainly a curious circumstance, that the appetite, in this state of disease, often continues good.

The appearances, on dissection, vary very much with the degree of violence in the inflammatory action, or what is nearly the same thing, with the period of disease at which death takes place. Sometimes we observe only an increased redness of the whole membrane; at other times, irregular patches of inflammation may be traced, elevated sensibly above the sound parts. The lower end of the ileum has been long observed to be the most common situation of these morbid appearances. Ulcers are frequently met with there, of an oval shape, having elevated edges. Sometimes a considerable extent of the inner membrane of the intestine is seen completely stripped from the muscular coat, or hanging attached to it in tattered shreds. In a few cases the ulceration perforates the peritonæal coat, and a portion of the contents of the intestines passes into the general cavity of the abdomen, producing inflammation that speedily proves fatal. Inflammation of the intestine, sometimes, although rarely, advances to mortification.

The causes of this affection of the internal membrane of the bowels are not very well understood. A disposition seems to be given to it by irregular habits of life, and one attack certainly favours a recurrence of the complaint. It prevails at times epidemically. I have seen it in its idiopathic form, arising from accidental exposure to cold and moisture, but it is much more commonly witnessed as supervening on other diseases. It appears in the progress of continued fever, consumption, and all diseases attended with hectic, and it is one of the most frequent sequelæ of measles. It would seem, indeed, as if inflammation and ulceration of this structure readily took place, whenever the system was in the state either of very high or very long protracted inflammatory excitement.

If the disease comes under treatment in an early stage, great

advantage will be derived from taking away ten or twelve ounces of blood from the arm.* This I have several times seen to give an immediate check to the disease. At a later period, leeches prove an excellent substitute. Active purging is carefully to be avoided. Small doses of castor oil, or the sulphate of magnesia with a few drops of tinctura opii, will occasionally be found useful: R. Ol. Ricin. dr. i. Mannæ, dr. ii. Pulv. acaciæ, gr. x. Aq. fluvial. dr. iv. M. f. haust. Take every four hours.—R. Infus. ros. dr. x. Magn. sulphat. dr. ss. Tinct. opii, gtt. iv. Syrup. ros. dr. i. M. f. haust. sum. g. tert. hor.; but in the irritable condition of the bowels that then prevails, soothing, anodyne, and demulcent medicines are much preferable. R. Cret. pulv. compos. ℥i. Aquæ, oz. i. Syrup. papav. dr. i. M. f. haust. Take every six hours.—R. Ol. Amygd. oz. i. Acac. gum. dr. ii. Aq. distill. oz. vi. Syrup. rhead. oz. ss. M. f. emuls. dos. oz. i. quater die. Starch injections with laudanum may be recommended where the tenesmus is very troublesome. When the feverish symptoms subside, and the diarrhœa lessens, a gentle tonic will be useful; and after giving trial to a great variety, I have found none answer the purpose so well as myrrh, four grains of which may be added to the following draught: R. Decoct. cinchon. Infus. ros. comp. dr. vi. M. repet. ter indies. Particular attention should be paid to the diet of the patient, which should be of the lightest kind. All fermented liquors, and, at first, broths also should be strictly prohibited.

When the disease has assumed a chronic form, with extensive ulceration, the treatment is very precarious. Astringents and bitters, with laudanum, are indispensable with the view of checking the diarrhœa, but the astringent tinctures should carefully be avoided. Catechu appears to me to be less irritating than any of those to which I have given trial. A pill consisting of one grain of calomel with the extr. hyosciami, may be administered at night with considerable advantage. R. Extract. hyosciam. gr. iv. Hydrargyr. submuriat. gr. i. M. f. pill. Take it every night. Change of air may be advised, and a milk diet. Under this treatment I have seen many very unfavourable cases gradually recover.

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* Dr. Armstrong recommends bleeding with leeches to the belly and using the sparest diet, after the manner of Broussais, and also purging by gentle doses of calomel: He prefers this plan to large and repeated venesection from the arm; this however must depend upon the phlogistic character of the system and the extent of the disease. Broussais sometimes takes 60 oz. from the belly by leeches; there can be little difference, considering the distance of the surface from that of the mucous membrane of the intestines, whether it be taken locally or generally: the reduction of the system is the object to be gained. C.

Mr. Fosbrooke recommends cubebs combined with bismuth; and leeches to the belly; he treated one case of dysphagia, combined with stricture of the œsophagus, by cubebs and the sub-carbonate of soda with success.

DYSENTERY.

Dysentery is a disease closely allied in its symptoms to that which was last under examination; and though it would probably be going too far to say, that in cases of mild dysentery there is always inflammatory action of the vessels of the mucous membrane of the intestines, yet in severe cases of the disease, this certainly happens; and there can be no great error in considering dysentery as at all times arising from, or strongly tending to such a state. This view of the *proximate cause* of the disease is borne out by a consideration of its remote causes, of its symptoms, and of the efficacy of a treatment similar to that which is adopted in other inflammatory affections. Dissection also leads to the same conclusion; for ulceration and mortification are here commonly met with, as in the inflammations of other parts. We presume that in dysentery the principal seat of disease is the inner membrane of the *great* intestines, for morbid appearances chiefly present themselves in that part of the alimentary canal.

The etiology of this disease has given rise to some diversity of opinion respecting its pathology.—That an inflammation of the mucous membrane of the intestines is to be referred to heat, as its remote cause, there can be no doubt, because it is to be found in situations where marsh effluvia does not exist, although it has too generally been ascribed to this cause. The same cause (heat) exerts a powerful influence on the liver, and hence, the state of the liver is thus far connected with dysentery. There is nevertheless an inflammation of the mucous membrane of the intestines, more intimately connected with the condition of the liver, with a more distinct remitting fever, evidently arising from marsh effluvia. In this case the remittent is the epidemic, and it occurs in autumn, after the usual season of the other variety. This is usually a more inflammatory fever and requires a more vigorous procedure to cure it. It is always accompanied by a congested state of the liver, and frequently by a suspended secretion of bile and an obstinate constipation of the intestines. Besides the comparative indication of blood-letting, it always requires the long continued use of the cathartic powers; especially heavy doses of calomel, which are indispensably necessary to restore the hepatic secretion. The congestion is, in many cases, as obstinate as in the yellow fever, and requires the same force to remove it.

There is a dysentery occasioned by introducing putrid vegetable matter into the stomach; such as flour, or bread in an incipient state of putrefaction. It can be cured only by omitting the use of the article that occasioned it. P.

CAUSES.

Dysentery is peculiarly the disease of warm climates and seasons. Between the tropics it often rages with a degree of violence, of which no adequate idea can be formed from instances of the complaint witnessed in this country. A sudden check to

perspiration is perhaps the most common of its exciting causes. The night dews of hot countries are therefore particularly to be guarded against; but excessive fatigue and long exposure to the direct rays of the sun appear in some cases to have brought it on. Some stress has been laid upon irregularity of diet (such as eating abundantly of ripe fruit), as tending to dysentery, but its influence has probably been over-rated.* That contagion has occasionally operated as a cause of this disease, in camps and on board slave-ships, cannot, I presume, be questioned; but neither in this country nor in tropical climates is dysentery contagious under common circumstances.

Dysentery is generally a form of the bilious remittent fever of the summer and autumn, and is produced generally by exhalations from vegetable and animal decomposition; the effects of which are brought into action by the cold air of the evening, sudden vicissitudes of temperature, or any cause which cools the surface, and gives the disease a centripetal direction

With regard to its contagious nature, the inflammatory and remittent forms of dysentery, in which the perspiration is checked by the violence of the fever, have not that quality; because the perspiration does not furnish a sufficiency of the poison to communicate the disease. In the typhous variety, however, it is otherwise; in that the skin discharges the noxious matter from every pore. The excretions of course, if not removed, will in all its forms produce the dysentery, as they would in other maladies. It also originates from the air of dissecting rooms, the injection of putrid substances into the blood vessels, from drinking cold water, and from acrid substances in the intestines; as bile, the discharge of ulcers in the stomach or bowels. C.

The characteristic symptoms of dysentery are griping pains of the bowels, and a frequent desire to go to stool, the evacuations being watery, mucous, or bloody, and without any admixture of natural fæces. The patient perpetually complains of a *load* in the intestines, which he endeavours to throw off by violent efforts of straining, and though he feels them to be ineffectual, he is unable to resist them. Small lumps called *scybala* are sometimes passed, but their appearance is not uniform, nor of any particular importance.

This state of disease in the alimentary canal is always accompanied by fever; in many cases of a highly inflammatory character. The pulse is very frequent; the mouth and fauces dry and clammy. The tongue is covered with a dark fur in the centre; or, when much bile is secreted, with a yellow fur at its posterior part; or it is red and polished. In severe cases the stomach becomes very irritable, the mildest fluids being rejected, while an unceasing thirst prevails; or that state of sympathetic irritation in the

* Unripe fruit, all acid and acescent substances will unquestionably produce dysentery; and ripe fruit when taken in too great quantities will do so likewise, in debilitated habits, in children, &c. Cold water drank largely has also produced it.

whole tract of the alimentary canal takes place, by which *tormina* and *tenesmus* immediately succeed the swallowing of the blandest liquids.

The nervous system suffers also severely. Nothing appears to weaken the body so much as dysenteric purging. In very bad cases, hiccup, cramps of the gastrocnemii, and strangury occur; and great exhaustion of power is evinced in the staggering or giddiness, and even syncope, which take place when the patient is brought into the erect posture.

It is not the evacuation by cathartics that occasions this abject state of debility, but the effect of the irritable state of the intestines communicated to the stomach, brain, and whole nervous system. The violence of the tenesmus causes universal sympathy, and free purging by medicines abates or removes the pain and consequent debility. We are aware that there is a dysentery of a low death-like debility, in hospitals, ships, camps, and occasionally in old persons; and that in such a state we cannot employ evacuants. We sometimes succeed by opium, cinchona, wine, and other cordials, but it is the most intractable fever we have had occasion to treat. P.

The duration of the disease is subject to great variety. The acute dysentery of hot climates sometimes proves fatal in a few days; but in a practical point of view it is more important to bear in mind the disposition of the disease to assume a *chronic* form.

The symptoms of dysentery vary according as it is of the inflammatory, the remittent, or typhous type. In the inflammatory form the symptoms are more intense; the pain in the belly is fixed and violent, with great heat in the integuments and skin generally; the evacuations consist of blood and mucus; or of bloody serum or pure blood with tenesmus, suppression of urine, and great desire for the coldest water; a white and furred tongue, the pulse febrile and quick, or full and bounding. The stools at length become involuntary; and are intolerably fœtid, mixed with pus and shreds of membrane, or formed into round balls called scybala. The rectum is often protruded. It sometimes proves fatal in a few days or a week, at others not for two or three.

In the remittent form, nausea, bitter taste in the mouth with bilious evacuations, distinguish it.

In the typhous form, fainting, stupor, heaviness, ghastly expression, and calm delirium, with discharges from the mouth of green bile; watchfulness and head-ache, are often the first symptoms; more decided marks of debility appear; the voice becomes weak, the tongue and teeth brown or black; excessively copious or very slight stools, with great pain or none at all in the bowels. The stools are of various colours; mucous, watery, dark, green, black, or serous. The pulse low, thread-like, and intermitting, with the other symptoms of typhous fever, as picking of the bed-clothes, cold extremities, hippocratic face, &c. succeed and close the scene.

Dysentery is distinguished from diarrhœa by the tenesmus, bloody stools, and general fever which characterise it. C.

MORBID APPEARANCES.

In very severe and protracted dysenteries, dissection exhibits the inner membrane of the great intestines thickened, and form-

ed into small irregular tubercles of a white or yellowish colour, with thickening of the peritonæal and muscular coats. In some instances, patches of the membrane have been observed in a state of high inflammation. Occasionally it is found abraded or extensively ulcerated. This appearance has been seen to extend to the small intestines. In tropical dysenteries the colon has sometimes been found decidedly in a state of mortification; and fæces have even escaped through the mortified gut into the cavity of the abdomen. With these, which are the true dysenteric appearances, marks of peritonæal inflammation are not unfrequently united.

TREATMENT.

The treatment of dysentery is to be regulated by a consideration, first of the tendency to inflammation which exists in the mucous membrane of the intestines; secondly, of that apparently spasmodic contraction of the muscular fibres in contact with the diseased membrane, by which the fæces are retained; and lastly, of that morbid increase of irritability in the whole extent of the alimentary canal, which prevails in this as well as other affections of its mucous membrane.

If the pain be constant and severe, and the pulse strong, or cordy, blood should be taken from the arm, particularly in a case which comes early under treatment.* But the employment of *purgatives* constitutes the most important part of the cure of dysentery. They must be steadily persisted in, until *fæcal* evacuations have been produced, and that sensation of load in the bowels completely removed, which leads to the ef-

* When there is no pain except on motion, and the pulse is small and corded, bleeding is also necessary. Frequently the character of the constitution alone indicates bleeding; thus if it be plethoric, youthful and robust; also if the patient have lived high; likewise, after a chill of long duration, and a cold season, the disease may be expected to be inflammatory, and V. S. will be required. It should be drawn freely even to fainting, if the symptoms run high. The patient should then take copious draughts of some mild diluents; as mucilage of gum arabic; barley water, molasses and water, whey, linseed tea sweetened with sugar candy, cream of tartar water, or the valuable preparation recommended by Pringle and Huck. R. Ceræ flav. dr. iss. Sap. hispan. dur. ℈i. Aq. pur. dr. i. Pour them after being melted by a gentle fire into a mortar, and mix with them gradually eight oz. of water, and sweeten it with sugar. The warm bath after the system is reduced by bleeding, with fomentations to the belly, will be of great use. The bleeding should be repeated as often as the pain returns, till the inflammation is completely subdued, and till then emetics and purgatives are dangerous in the inflammatory form; the patient should be kept at rest, as long as the inflammatory diathesis continues; after it is somewhat subdued small doses of ipecacuanha, or tartrite of antimony may be given to excite perspiration. All stimulating, astringent and heating substances, as opium, kino, columbo, bark, and alcohol, must be avoided, and as soon as the system is reduced, we must commence the purges. C.

fort of straining. Then, *and not until then*, may the practitioner desist from the free use of his cathartics. Almost every kind of purgative medicine has been tried, and at different times recommended. Provided a due effect be produced, it does not appear to be of much consequence which of them is selected; but the liquid *form* is generally to be preferred. A pill of six grains of calomel, followed immediately by an ounce of the sulphate of magnesia, will commonly be found to answer well. In some cases, the oleum ricini may be preferable. If the stomach rejects these medicines, some other form of cathartic is to be chosen; the opium being added with the view of allaying irritation. R. Extract. Colocynth. compos. gr. v. Hydrargyr. submur. gr. v. Opii, granum. M. f. pill. ii.; or, R. Hydrargyr. submuriat. gr. iv. Pulv. ipecac. gr. x. M. fiat pulv. Purgative enemata are found insufficient to overcome the disease. An ointment containing opium applied to the anus after every loose motion will greatly relieve the smarting which the acrid secretions of the bowels produce.

When proper fæcal evacuations have been procured, it will generally be proper to continue the same medicines in smaller doses; R. Infus. ros. comp. dr. x. Magnes. sulphat. dr. ss. Tinct. opii gtt. iv. Syrup. ros. dr. i. M. f. haust. sext. hor. sumend.—And R. Extract. compos. colocynth. gr. ii. Pillul. hydrargyr. gr. iii. f. pill. omni nocte sumenda. And if after that, pain and diarrhœa continue, anodyne draughts, as R. Mistur. amygdal. oz. i. Tinct. opii. gtt. xx. Syrup. dr. i. M. f. haust., and mucilaginous anodyne injections, as R. Mucilag. amyli. oz. viii. Tinct. opii, dr. i. M. f. enema astringens, will be found very useful. The pulv. ipec. comp. either in the dose of fifteen grains at bed time, or of six grains every six hours, is well adapted to this state of the disease. It promotes perspiration, a proper attention to which is very requisite during the whole course of the complaint. The effect of this medicine will be materially aided by the warm bath.

Proper diaphoretics in small doses should be interposed between the purgatives, and thus the skin may be kept soft during the whole day: Their effect may be assisted by an occasional use of the warm bath.

The use of tartrite of antimony in small doses with a large quantity of water has been much celebrated by Senac; it may be given in the dose of a gr. dissolved in a pint of water, taking a wine-glass full every hour. With this plan, I have succeeded in relieving bad cases of this disease, using no other medicine. In children it is admirable, from its want of taste. The vitrum ceratum antimonii is also much praised, particularly by Sir John Pringle. It may be given in the dose of 3 or 4 grains, gradually increased to 8, which is the proper quantity for an adult. The advantage of the cerated glass of antimony is that it is not so liable to irritate the stomach as the ordinary preparations of that metal do.

Emetic medicines have also been given in the form of injection by Dr. Clarke, and it is said with great success; a decoction of ipecacuanha in a quart

of water down to a pint, as an enema twice or thrice in twenty-four hours, is the form in which it was exhibited.

In the course of the disease, laudanum, or an ointment containing opium applied to the fundament upon a piece of lint after every stool, will greatly relieve the smarting produced by the irritating evacuations.

Tobacco is highly praised by Dr. O'Beirne of Dublin: R. Nicot. folior. gr. x. Aq. Fluvial. ℥vi. m. f. enema. This injection was thrown up, but it was immediately rejected; fomentations of the plant were then applied to the abdomen, sickness, weakness, and a copious perspiration followed, and large stools with an abatement of all the symptoms.

The infusion after it stands several hours loses its virtues; the advantages of using it in fomentation are that it can be removed so easily. It is probable that it may form a valuable substitute for the lancet in this disease. The appetite returns immediately after the use of it. C.

In hot climates, the exhibition of mercury, pushed so as to produce salivation, has been recommended as an effectual method of putting a check to the advances of dysentery.* The testimonies in favour of this practice are certainly very strong; at the same time we have no reason to believe that a vigorous and well regulated employment of the means already recommended, is less efficacious in hot climates than we find it in our own.

Calomel in small doses, in union with ipecacuanha, or the simple blue pill, or the mercurial ointment rubbed into the skin twice a day till it disappears and the mouth becomes sore, will be proper for this purpose; salivation will be found most valuable when the disease is united with diseased liver or inclines towards typhus; in the inflammatory and remittent varieties the depleting and purging plan with diluents largely given, and fomentations to the belly, blisters, &c. will generally be found sufficient.

With regard to the treatment of the typhous form, the most perfect ventilation and cleanliness should be observed. Venesection is improper even in the first stages; and purges must be used moderately; they are not useful in all cases, but must be regulated according to the state of the system: If the patient be very faint, and the evacuations be copious and watery, with great marks of debility, cathartics will be improper and tonics must be substituted.†

The treatment of the typhous form should be commenced with an emetic; either of tartrite of antimony or ipecacuanha, assisting its operation by chamomile or eupatorium tea; the bowels are then to be opened, and the degree of purging is to be regulated by the debility; gentle purgatives followed by tonics will generally be most safe; and after their operation sudorifics will be found to be valuable. The evacuations should in all cases be sufficiently free to discharge the contents of the bowels of any unnatural collection of matter, at the same time guarding against weakness by giving a dose of laudanum with chalk or some astringent, as kino, after every stool. The system must be supported by soup; panada made with white wine: a half pint of wine, a pint and a half of barley water, an oz. of cinnamon water, and six oz. of sugar, taking an oz. every hour, is a formula recommended by Van Swieten. The volatile alkali and wine whey; camphor in small doses: also cinnamon, pepper, allspice, cloves are valuable stimulants in this form; astringents where the stools are copious are indispensable. Blisters applied to the legs often are

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* See a paper by Dr. Fergusson, in the Medico-Chirurgical Transactions, vol. ii. p. 182.

† Med. Record, p. 761, vol. viii.

useful in the last stages. The sulphate of quinine, snake-root, and musk, will also be found to be valuable. The convalescence must be managed by gentle purgatives, as the infusion of rhubarb combined with tonics, quassia, columbo, or gentian. The dysenteric symptoms, however, must be well watched, as otherwise tonic medicines will irritate the bowels and produce a relapse.

The diet in dysentery should be light, and digestible; the yolk of eggs, barley water, rice water, arrow root, tapioca, sago, almonds and milk, adding a little ginger, or aromatic powder, to render the diet more palatable, will be proper. The white of eggs, flesh of all kinds, broths, fat, butter, oil, and spirituous liquors, should be avoided: the summer fruits are in general most salutary and assist the cure. Zimmerman states that warm milk during the convalescence, produces pains in the lungs and incapability of exertion and even death in a few days. Pringle also states that it renews the griping. Exposure to cold, damp air, violent passions, indigestible food, produce relapses. Swathing the bowels with a flannel bandage is valuable from its warmth, as well as for the support it gives to them. Flannel should be worn next the skin, and the patient during the convalescence should take gentle exercise.

In the course of treatment, the danger of narcotics, astringents, and spirituous medicines cannot be too seriously urged: they produce a translation of the disease; for apoplexy, epilepsy, rheumatism, ophthalmia, and incurable cutaneous disorders, &c. are their results.

With regard to the prevention of the disease; every thing heating and stimulating should be avoided during its prevalence; also exposure to the night air; to wet, particularly when heated; and to cool draughts of air: the air of the chambers of the sick should be well ventilated; their linen often changed; vomits should be taken by those about the sick when they feel unwell in the slightest degree, a bitter taste, pain in the belly, or have restless nights,—also gentle purges, as rhubarb: fear, grief, and all the depressing passions must be repressed.

Lime water and milk, or mixed with barley water, is also useful when the bowels become affected with looseness or otherwise: rice, or barley water, mutton broth, are proper drinks when the patient is still weak; flour boiled with milk and sugar is also valuable as a diet; all malt liquors should be avoided, as they will re-excite the purging. The patient may take a little brandy or weak spirit and water when the purgings and pain have been removed. C.

CHRONIC DYSENTERY.

Chronic dysentery is the sequel of the acute stage. It is sometimes connected with structural derangement, particularly ulceration of the mucous membrane of the colon; but at other times it appears to be only a continuance of that diseased action previously established. . In the former case purulent matter may sometimes be detected in the motions; but, for the most part, the local symptoms will only differ in the degree of their violence from those of the acute stage. This is a very dangerous form of disease. When the membrane is *extensively* ulcerated, extreme weakness and emaciation follow, and the patient is at length worn out by the incessant discharge which is kept up. It is surprising however to observe how long he will sometimes linger under circumstances apparently hopeless. In such a state, the slightest irregularity of diet, or regimen, aggravates the symptoms. Ulceration of the intestines has been supposed to heal with difficulty under all circumstances; but it is obvious that

the healing process will go on most favourably, when a light, unirritating, and easily digested food is taken. A gentle action should be kept up also in the bowels, so as to prevent accumulation and distension. Hence we may see the propriety of directing an occasional dose of rhubarb and calomel, as R. Hydrargyri submuriat. gr. iii. Rhei pulv. gr. vii. M. f. pulv., or of castor oil, when there is any considerable degree of griping pain.

When the circulation is languid, and the constitution much weakened, it is reasonable to suppose that the local action of ulcers will also be weak and indolent, and likely to be improved by such medicines as promote digestion, and give *tone* the system.* This conclusion is supported by experience. Benefit has been derived, in many cases of chronic dysentery attended with ulceration, from the exhibition of a decoction of bark, myrrh, the aromatic confection, balsam of copaiva, and other stimulant and tonic drugs, as, R. Bals. Copaib. gtt. xv. Vitell. ovi, q. suf. Aq. cinnam. Aq. distillat. sing. dr. v. Sp. lavand. comp. dr. ss. Syrup. dr. i. M. f. haust. ter die sumend.

Or, R. Cascarill. cort. contus. Columb. rad. incis. āā dr. i. Aq. Fervent. oz. vi. Liquori frigefacto, et colato adde Tinct. Colomb. dr. iii. Spirit. Ammon. aromat. gtt. xxx. Syrup. aurant. dr. iii. Dos. dr. vi. bis vel ter die.

Or, R. Decoct. cinchon. dr. x. Confect. aromat. ℈i. Tinct. cinchon. dr. i. M. — capt. quart. quaq. hor.

When the evacuations are copious, but unattended with pain, and probably kept up by an irritable state of the membrane, astringents, absorbents, and opiates may be required; but in every case their effects are to be carefully watched, and omitted altogether, if they bring on tormina. R. Infus. Cascarill. oz. vi. Pulv. Kino. compos. dr. i. Syrup. papav. oz. ss. M. ft. mist.—oz. i. quaq. sext. hora.

R. Cret. ppt. pulv. oz. ss. Ol. menth. pip. gtt. i. Laudan. liquid. dr. i. Mucil. gum. arab. oz. vii. M. — oz. ss. q. sec. hor.

R. Tinctur. Kino. oz. ss. Aq. Cinnamom. oz. iii. Laudan. liquid. dr. iss. M. — oz. ss. q. sec. hor.

Or, R. Extract. Lign. Campechens. dr. iss. Mistur. Cretac. oz. vi. Tinct. Kino. oz. ss. M. — oz. ss. cap. q. sec. hor.

R. Vitriol. alb. dr. ss. Alum. sulphat. dr. ii. Aq. Fluvial. oz. vi. M. — oz. ss. q. secund. hor.

R. Pulv. Kino. dr. ii. Mucil. gum. arab. oz. v. Ol. menth. gtt. i. M. Oz. ss. q. sec. hor.

Lime water taken freely has an excellent effect, particularly where there is nausea with acidity. The sulphate of copper, in

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* Consult Bampfield's Practical Treatise on Tropical Dysentery, which contains a very full and judicious exposition of the varieties of the chronic form of the disease, and of the principles of its treatment.

the dose of two grains twice or thrice a day, has been found a useful astringent in chronic dysentery. It not unfrequently happens that the patient gradually recovers his strength, appetite, and flesh, during a moderate state of diarrhœa. In some instances it is found, that small doses of mercury (either in the form of hydr. cum creta, pil. hydr. or calomel) in combination with ipecacuanha, contribute to an improved appearance of the secretions of the intestines. The complication of dysentery with chronic hepatitis, which is occasionally met with, will be an additional motive for the exhibition of mercurial alteratives.

The nitric, muriatic, or oxymuriatic acids in the dose of two or three drachms in the day with barley water, followed by the infusion of columbo, quassia, cascarilla, &c., have a good effect in this form; united with laudanum, in the dose of a few drops, the acid is particularly serviceable. R. Acid. nitrici, ʒii. Tinct. opii, gtt. xxx. Aq. Fluvial. ℥iii. m. Take a tea spoonful three or four times a day in any convenient vehicle.

The general plan of keeping open the bowels should be had in view, using those means, which suit best particular complications, as mercury and nitric acid, when the liver is affected; simple purgatives, as rhubarb, mixed slightly with tonic and astringent substances, when it is the consequence of an ordinary attack of the inflammatory remittent variety, using opiates at night, combined with moderate sudorifics, form a plan which is attended with the best effects. R. Laudan. liquid. gtt. xxx. Vin. antimon. gtt. xv. Aq. menth. piperitid. ℥i. —hor. somn. sumend.

R. Opii. gr. i. Nitri. gr. xii. Tartrit. antimon. gr. i. M. f. pulv. hor. somn. sumend. Sometimes the hyosciamus is excellent from its laxative effects and is to be preferred to the opium.

Often the local application of anodyne medicines, as opium, relieve tenesmus very successfully; a poultice with laudanum in it applied to the fundament, or an anodyne injection of a wine glass full of barley water and sixty drops of laudanum, or the introduction of a few grains of opium into the rectum in a pill, often have the most beneficial effects in curing this symptom. Sometimes however it is kept up by an inflammatory state of the system. Sydenham cured it by bleeding from the arm: in such cases mild aperients with leeches to the arms would be the best remedy.

In chronic dysentery, lime water taken freely has an excellent effect, particularly where there is nausea with acidity and some derangement of the bowels.

In all stages, the drinks should be taken warm, as there can be no question but that cold water has often been the exciting cause of the disease: upon this subject Zimmerman, Dewar, and Tissot, are decided. C.

Such are the principles upon which the treatment of chronic dysentery is to be conducted. They should be well understood, because an injudicious practice may do much harm, though the best regulated may prove ineffectual.

CHAPTER XVI.

HEPATITIS.

Acute Inflammation of the Peritonæal covering of the Liver—Diagnosis—Inflammation of the Substance of the Liver—Terminations of this Disease—Of Hepatic Abscess—Causes of Acute Hepatitis—Treatment—Of Chronic Hepatitis—Its Symptoms, Causes, and Treatment—Torpor of the Liver—Diagnosis of Hepatalgia.

ACUTE INFLAMMATION OF THE PERITONÆAL COVERING OF THE LIVER.

The peritonæum forming the capsule of the liver is liable to acute inflammation; and it is the common form of hepatitis which we have occasion to observe in this country.* The *substance* of the liver is also the seat of inflammation, both acute and chronic. This disease too is occasionally met with here, but both are infinitely more frequent in hot climates, where hepatitis may justly be considered as *endemic.*

DIAGNOSIS.

The peculiar symptoms which denote that the peritonæal surface of the liver is the seat of inflammation, are, pain in the right hypochondrium, shooting to the back and shoulder, generally very acute, permanent, and increased on pressure; a white and dry tongue, hurried respiration, cough, and difficulty of lying on the left side. Jaundice occasionally occurs, and more particularly, it has been supposed, when the membrane covering the concave surface of the liver is affected; but it is not to be considered as a necessary concomitant of the disease.† The bowels are

* The peritonæal covering of the liver is seldom inflamed as a consequence of cold, like the other viscera. Occasionally the disease extends from the pleura costalis to the covering of the liver, though but seldom. In acute cases of hepatitis the membrane becomes diseased secondarily. P.

† For jaundice, as Dr. Latham observes, may proceed from an enlargement of the pancreas, which presses in the gall-ducts, though there may be present no disease of the liver whatever: A diseased ovarium in the same manner has been mistaken for hepatitis from its connexion with jaundice.

sometimes constipated. At other times diarrhœa is present. Indeed inflamed liver and dysentery frequently coexist in the same patient.

Some stress has been laid on *cough*, as a symptom of acute hepatitis, because it is likely to create difficulty in distinguishing this disease from inflammation within the chest. It is sometimes loose, but more commonly dry, and appears in many cases to be owing to the spreading of inflammation from the surface of the liver to the diaphragm.* A full inspiration does not always produce *cough*, though it increases *pain;* and very generally this symptom does not appear till the second or third day of the disease. In this manner, and by the increase of pain from pressure, we are commonly able to distinguish acute hepatitis from pneumonia. The diagnosis between inflammation of the liver, and spasm of the gall ducts from the passage of a biliary calculus, will come under consideration hereafter, when the symptoms of jaundice are explained.

INFLAMMATION OF THE SUBSTANCE OF THE LIVER.

Whether the hepatitis of warm climates begins in the membrane or parenchyma of the liver, is of little moment; for it is abundantly obvious, that in a large proportion of cases, the latter structure becomes quickly, and to a great extent, involved in the disease. The symptoms which characterise acute inflammation of the substance of the liver, are in most respects the same with those of its peritonæal surface; but in addition to them, some degree of swelling is generally to be felt externally; the pain is more obtuse than when the membrane is affected; jaundice takes place; the urine is of a deep saffron colour; the tongue is covered with a white, or sometimes a yellowish fur; the pulse is frequent and hard; the skin hot and dry; and commonly there is nausea and vomiting, not probably from inflammation, but extreme irritability of the stomach.

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* The inflammation spreads from the liver to the diaphragm, and along the pleura pulmonalis.—The pus discharged by the bronchia passes through the channel occasioned by inflammation into the lungs, and not (we judge) by the direction of the vis medicatrix through the lymphatics. Continuity of inflammation is the more probable rationale.—The abscess sometimes empties its contents into the gall bladder, and passes thence into the intestines. Patients sometimes recover after such an event; all the matter having passed off per anum.

Hydatids are never found, accompanying hepatitis, except after inflammation has continued a considerable time. They are not living independently organized bodies, as has been imagined, but seem to be the result of inflammation of the membranes lining the cavities of the thorax, abdomen, intestines, and sometimes are found in the ventricles after chronic inflammation of the brain. The same process that causes adhesions between similarly organized surfaces and membranes, seems to generate hydatids in the great cavities. P.

TERMINATIONS.

In hot climates, the inflammation of the substance of the liver often advances with great rapidity, so that in a short time suppuration takes place; and it has been observed that an abscess forms in the liver as rapidly where the local pain is trifling as where it is intense.* In cases of hepatitis, originating in this country, abscess of the liver must certainly be viewed as an uncommon occurrence. That suppuration will take place, may be inferred from the pulse continuing full and frequent, and the pain urgent, with *rigors*. When abscess has actually formed, there will be a sense of weight in the part, with *throbbing* pains occasional flushings of the countenance, night perspirations, and other marks of hectic fever.

HEPATIC ABSCESS.

The further progress of the disease is subject to great variety. Hepatic abscess frequently proves fatal without any escape of its contents, but at other times the matter works its way out by one or other of the four following modes. Adhesions sometimes form between the liver and the parietes of the abdomen; the tumour becomes more and more prominent; and the matter is discharged by an external opening. The usual situation of such a tumour is between the third and fourth false ribs. Sometimes, where such adhesions have not formed, and the walls of the abscess are thin, the matter bursts into the cavity of the abdomen, bringing on peritonæal inflammation, which quickly proves fatal. Occasionally the matter of the abscess finds its way by ulceration into the colon or stomach; and patients have recovered where there was reason to believe that such an event had occurred. Lastly, it is by no means uncommon for abscess of the liver to form a communication with the cavity of the thorax by erosion of the diaphragm. Pus will then be discharged (generally along with bile) by the bronchia, giving rise to the very curious symptom of *bilious expectoration;* but the patient seldom recovers. The abscesses formed by an inflammation of the liver are often of enormous size, capable of holding several quarts of matter. Very frequently *hydatids* are found accompanying them, and they add greatly to the danger of the disease. The pathology of these morbid productions is very little understood. They have been found in all the great cavities of the body, but more frequently attached to the liver than in other situations. Under any

* Dr. Clark, of Dominica, relates a case (Duncan's Medical Commentaries, vol. xiv.), where suppuration began on the fifth day of the disease, and on the twenty-ninth the abscess burst; almost the whole substance of the right lobe of the liver being destroyed.

circumstances, abscess of the liver is a dangerous state of the disease.* It is only where the abscess is small, that recovery can, with any degree of confidence, be anticipated.

CAUSES OF ACUTE HEPATITIS.

The causes of acute hepatitis are the same with those of inflammation generally; but a very strong predisposition to it is given by hot climates, and a long course of full living with indulgence in spirituous liquors. Heat appears to have some peculiar and inexplicable influence upon the liver. To this principle only can we attribute the frequency of hepatic complications with the intermittent and continued fevers of warm countries, the occurrence of cholera and other bilious affections in this country during the summer and autumn months, and the general prevalence of hepatitis in tropical regions.

The distinction between the effects of heat and miasmata as the remote causes of diseases has not been clearly drawn. Heat begets one class of fevers and miasmata another. Heat occasions fevers of all degrees according to the condition of the body on which it acts. It excites inflammations of the brain by direct evolution, and promotes in its primary action an increased secretion of bile; but something more is required to give it its great and ultimate consequence. It induces general prostration by excess of stimulation. It is in this way it occasions congestions in the whole hepatic circle, and thus the economy of the brain is disturbed. In cholera, heat occasions a great and sudden congestion, which excites the secreting vessels of the liver into an inordinate morbid secretion, which weakens the whole system and prevents the fever that would accompany a scanty or suspended secretion.—The long continued action of heat (especially in a dry atmosphere,) gives rise to inflammatory fevers, with affections of the brain and an increased hepatic secretion in subjects unaccustomed to it, while it occasions *slow nervous fevers* in those accustomed to it. This last is a disease of indirect debility. The diseases of heat all approach nearer a continued form, than those originating in marsh effluvia. Some of them are altogether continent. Heat never did occasion an intermitting fever, but both intermitting and remitting fevers are sometimes modified, by high degrees of heat, during the evolution of marsh effluvia, as we see in certain examples of dysenteric intermitting and remitting fever. P.

It has been remarked, that the liver in warm climates seems to be the seat of disease nearly in the same proportion that the lungs are in Great Britain. Many of those who suffer from acute and chronic hepatitis in this country, have had the foundation of the disease laid by residence in a hot climate. The predisposition to liver disease which is given by high living and spirituous liquors, though less interesting in a pathological view, is practically of far more importance; and it is applicable not only to

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* Enlargements and indurations of the liver; tubercles, and a honey-combed appearance of its substance are also found.

A gradual diminution of the pain, fever, the colour of the countenance becoming natural, denote a disappearance of the disease. C.

acute inflammation of the liver, but to every form of chronic derangement of the hepatic system, whether occurring in hot or cold climates. It must not, however, be forgotten in practice, that genuine acute inflammation of the liver is occasionally met with in this country, where no suspicion of high living can be entertained;—in delicate chlorotic young women for instance, and in the latter stages of phthisis pulmonalis.

TREATMENT.

The treatment of hepatitis when it occurs in cold or temperate climates, and when it may be considered as confined altogether, or nearly so, to the investing membrane of the liver, is to be conducted on the principles which were laid down in the last chapter, as applicable to peritonæal inflammation generally. Bleeding from the arm, and locally by leeches or cupping, with fomentations and blisters, are principally to be relied on; but the employment of saline purgatives, is also of very essential benefit: R. Magnes. sulph. dr. i. Infus. ros. oz. i. Syrup. aur. dr. i. M. sumt. haust. tert. hor.

R. Aq. menth. pip. oz. ss. Magnes. sulphat. dr. vi. Conserv. ros. dr. i. M. et cola. ft. haust. aperiens.

A purgative draught, with a few grains of calomel, may even be ordered immediately after the first bleeding. Purging appears to be a means of diminishing inflammatory action, very well calculated for diseases of the liver. Pathologists have imagined that the peculiar distribution of the blood in the venous system of the abdomen may in some measure account for this. By increasing the secretions of the intestinal canal, it has been supposed, with some appearance of reason, that congestion of blood in the vena portarum, and consequent distension of the liver, may be, to a certain degree, lessened or prevented.

It has long been observed, that the blood which is drawn in inflammation of the liver, exhibits the very remarkable appearance of *greenish buff;* and different ideas, none of which, however, are very satisfactory, have been entertained regarding the cause of this phenomenon. The great danger of suppuration in the hepatitis of hot climates makes it necessary to be prompt in the employment of venesection. The same consideration induces some to employ *mercury* on the first attack.* The propriety of

* The practice of prescribing mercury indiscriminately is not only useless but injurious in acute hepatitis. The action of the metal foments inflammation, without effecting a salivation, and thus renders more bleeding and purging necessary. It will not operate freely as a cathartic without the aid of other purgatives, and for these reasons it cannot be relied on. Bleeding and the aperient neutral salts should be pushed pari passu, till the more aggravated degree of inflammation shall have been removed. Purging occasionally will not do, and should the neutral salts not succeed well they should be assisted by

this practice in hot climates cannot properly be judged of by experience acquired here, but theory and analogy seem equally opposed to it. When the febrile symptoms abate, however, recourse should undoubtedly be had to this remedy, in the manner which will presently be noticed. It is seldom that mercury is absolutely requisite in the acute hepatitis of this country; but under proper management, it may be resorted to even here, in the latter stages of the disease, with some prospect of shortening the convalescence.*

In the hepatitis of hot countries, the vigorous employment of the lancet and of active mercurial purgatives, can alone ensure a fortunate termination. R. Extract. Colocynth. comp. gr. v. Hydragyr. submur. gr. v. Opii, granum. M. f. pillul. ii.

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other means. The necessity for almost unremitted purging arises from a condition of the liver that is to be observed in some other diseases; yellow fever, common bilious remittent and pneumonia biliosa. In all these affections the secretion of vitiated bile is abundant and imparts a stimulus to the nervous system that will aggravate all the worst symptoms, one which the loss of no quantity of blood will tame or even mitigate unless it be purged off as fast it may be secreted. This is the reason why some have erroneously concluded that blood-letting is not as useful in hepatitis as in other visceral inflammations. P.

* Cooling drinks; the antiphlogistic regimen; arrow root; barley water, in quantities barely sufficient to support life; cool air; the free use of purgative medicines; the pediluvium with sudorifics, of small doses of tartrite of antimony, and nitre; of spirit. mindereri; of salt of tartar or lime juice, form the accessory means of treatment.

When mercury is resorted to, a gentle swelling of the gums will be sufficient; it may be excited by rubbing into the side or the groins a dram of the ointment, or giving a grain of calomel every night, or four grains of the blue pill three times a day; at the same time continuing the frictions if we wish to produce the effect rapidly: sometimes the disease yields as soon as the soreness of the gums is excited, at others, it is necessary to continue it for weeks; and often the inflammation gradually abates under the use of mercury, though no effect takes place upon the gums whatsoever.

If suppuration has taken place, poultices should be applied over the part, the patient should live upon a more generous diet, take the bark, wine or porter, with the nitric, muriatic, or oxymuriatic acids; and the tumour when it appears outwardly should be opened by a scalpel, dissecting gradually down to the sac of the abscess, and then opening it with a lancet or a trocar: The belly is then to be compressed with a bandage, and the sore covered with simple dressings: the wound must be kept open by tents dipped in some digestive ointment.* The British surgeons often open abscesses of the liver, when deeply seated, and when there is no other evidence of their existence but tumefaction of the side, and the progress of the fever; and as the openings in these abscesses heal more easily than any others, they often save the lives of their patients by this bold expedient.† After an abscess of the liver has discharged its contents, the bowels should be kept gently open, the diet should be light and nourishing, and wine abstained from; the exercise should be gentle, and in mild temperate weather only, as exposure to any sudden vicissitude may produce inflammation and destroy the patient: A stimulating diet may produce the same effect. C.

* Thomas, p. 188. † Ibid.

R. Pulv. Jalap. gr. xx. Hydrargyr. Submur. gr. iv. M. f. pulv.

The deceitful remissions which sometimes occur in the progress of the cure must not throw the practitioner off his guard, but on the first return of pain, the same remedies must be again resorted to.

CHRONIC HEPATITIS.

The term *chronic hepatitis*. is not confined strictly to that state of slow inflammation of the liver which is attended by fever, and which terminates like other inflammations in suppuration, though such a disease exists, and is by no means uncommon; but it is extended in common language so as to include different chronic affections of the liver, which may or may not have their origin in inflammation. It does not appear necessary, with a view to practice, to attempt any minute distinctions between the different chronic diseases of the liver, although in a pathological point of view, it must certainly be considered a matter of some interest. Were it even possible to ascertain during life the symptoms by which they could be distinguished from each other, it does not appear that we could, as yet, apply our knowledge to the discrimination of remedies. The appearances which the liver presents in cases of chronic hepatitis are, simple enlargement without alteration of structure, enlargement with increased hardness, or præternatural softness and flaccidity of its substance, a small and contracted state of the gland, an unhealthy mottled aspect of its peritonæal coat, an ash-coloured hue of its substance, abscesses, and lastly, various kinds of tubercle. Of all the modifications of chronic disease of the liver, the most important is tubercle.*

SYMPTOMS.

The symptoms of chronic hepatitis are various, but at the same time in many cases so obscure, that while persons have been suspected of it, whose livers were perfectly sound, others have died, in whom the disease had remained unsuspected during life. The characteristic symptoms of the disease are, a sense of weight, or a dull numb pain in the right side or back, pain at the point of the shoulder, or a sense of heaviness or weariness in the right arm, a sallow countenance, and yellow tinge of the conjunctiva. In some cases, the enlarged liver can be distinctly felt under the finger. The pulse varies in point of frequency, but is feeble and often intermitting; the tongue is permanently loaded, and the appetite impaired. The urine frequently deposits a pink sedi-

* This portion of the Morbid Anatomy of the Liver has been examined by Dr. Farre with great attention, in a work expressly dedicated to that subject.

ment. Venous hæmorrhages take place from the stomach and intestines, referable probably to the difficulty which the blood finds in passing through the vena portæ. For the same reason the external veins of the abdomen appear swollen. Pimples break out on the nose and forehead, and the face acquires a bloated appearance. Extreme languor, dejection of spirits, and sleepiness are often noticed. Dyspepsia and atrophy are also prominent symptoms.

CAUSES.

The observations already made on the causes of acute hepatitis apply equally to this form of the affection. It is sometimes the *result* of acute inflammation, but it sometimes also precedes that state of disease. Enlargements of the liver have been the consequence of long continued intermittents. Chronic hepatitis may last a long time; but in most cases it sooner or later ends in dropsy, which proves fatal. The prognosis therefore should always be guarded, particularly in elderly subjects. The probability of success in the treatment of the disease will depend partly on the state of the constitution, and partly on the extent of morbid alteration which the *structure* of the liver has undergone.*

TREATMENT.

The means of relief are comprised in a course of regular moderate purging; gentle doses of mercury pushed so as to affect the system; the occasional exhibition of bitters and acids, especially the nitric acid; with a light diet, and abstinence from all fermented and distilled liquors. Dr. Pemberton speaks highly of the efficacy of the extract of taraxacum: R. Extract. taraxac. dr. ss. Aq. Menth. sativ. oz. ss. M. f. haust. meridie et vespere sumend. Removal to a cold climate is often found indispensable in the chronic affections of the liver which occur to residents in the East and West Indies.

The chief reliance, as far as medicine extends, is of course to be placed on purging and mercurials. The natural purging waters, as those of Cheltenham, are well adapted to this complaint; but the Seidlitz, Epsom, or Rochelle salts, in doses so regulated as to keep up a gentle but constant action on the bowels, are, probably, equally effectual. Calomel or the blue pill may be given in small doses at night, but it commonly answers better to direct a scruple or half a drachm of the strong mercurial ointment to be

* For the fullest information concerning hepatitis, and for numerous splendid delineations of hepatic disorganizations, especially abscess, the reader is referred to Mr. Annesley's great work, entitled "Researches into the causes, nature, and treatment of the Diseases of India," 4to. 1827.

rubbed on the side every night, till the mouth be touched. This effect should be kept up, though cautiously, for several weeks. If feverish symptoms appear, or are aggravated under the use of this remedy, it should be immediately relinquished. The nitro-muriatic foot-bath has been found useful.

It is made by mixing equal parts of the nitric and muriatic acids together, and making the bath acidulous to the taste: It may be applied either to a part or to the whole body by a bath, or simply by sponging the surface: When continued for some time the acid often produces considerable effects, and gives some uneasiness from bilious discharges and disagreeable feelings; the diet should at the same time be antiphlogistic, avoiding almost entirely all vinous or spirituous liquors: The patient should abstain from butter and animal food; porter; take exercise in the open air, and by flannel be provided against the sudden vicissitudes of the climate.

Sometimes the slightest application of the acid cannot be borne from the nervous character of the subject: at others the system is affected with difficulty: It may be taken in water as a drink; it must be only slightly acidulated, and the teeth must be carefully avoided by sucking it through a quill, and washing the mouth immediately afterwards. Dr. Scott thinks its powers quite equal to those of mercury; given with it, the acid assists its operation.* C.

TORPOR OF THE LIVER.

In torpid states of the liver, especially such as are connected with dram-drinking, and where there is reason to believe that a vitiated secretion of viscid bile is taking place, some benefit is derived from alterative doses of mercury combined with the steady use of bitter and warm purgatives. The following pill taken every night is well adapted for this purpose; R. Extract. colocynth. comp. gr. ii. Pillul. hydrargyr. gr. iii. f. pill. omni noct. sumend.; and this mixture composed of senna, gentian, an aromatic, and an alkali, may be directed in the dose of an ounce twice a day: R. Infus. Senn. comp. oz. iiss. Infus. Gent. comp. oz. iii. Liq. potass. dr. ss. Tinct. Cardamom. compos. dr. iii. M. — oz. i. bis die. The compound decoction of aloes affords another combination very useful in such cases. R. Decoct. aloes compos. dr. vi. Aq. Cinnamom. dr. iv. M. f. haust. omni meridie sumend.

HEPATALGIA.

There is an affection of the side, frequent in young women, called *hepatalgia*, which has been by many conceived to depend on some low or chronic kind of inflammation in the vessels of the liver. Indeed such cases are often designated as those of chronic hepatitis. There is a well marked distinction however between these two diseases; and as the former is one of the most genuine *chronic* disorders which come under the physician's care, I shall delay further notice of it, until the subject of jaundice has been discussed.

* Med. Recorder, vol. i. 1818.

CHAPTER XVII.

RHEUMATISM.

Symptoms of Acute Rheumatism—Disposition to Metastasis—Causes—Seat of Rheumatism—Of the Rheumatic Inflammation of Synovial Membrane, or Arthritis—Principles of Treatment in Acute Rheumatism—Of Chronic Rheumatism—Varieties in the Symptoms of this Disease—Causes—Remarks on the Mode of Treatment applicable in the several varieties of Chronic Rheumatism—Peculiarities of Sciatica.

SYMPTOMS OF ACUTE RHEUMATISM.

Rheumatism is an affection of the extremities and external coverings of the human body, occupying the muscular, tendinous, and fibrous textures, and characterized by pain, stiffness, and swelling of a joint, with or without fever according to the violence of the disorder. In common life, a three-fold distinction is made, *viz.* into the true rheumatism, the rheumatic gout, and the rheumatic fever. The two latter alone merit the title of *inflammations*, but there is obviously a close analogy in the pathology of all these affections. In their symptoms and mode of treatment, however, sufficient difference exists to entitle them to separate examination. It is certainly a curious circumstance, considering the frequency of this complaint, that there should still be so much obscurity in regard to several of the fundamental doctrines connected with rheumatic inflammation. This may be partly explained, perhaps, from its being a disease of so little danger, as never to have received any elucidation from the labours of the morbid anatomist.

There is but one kind of rheumatism. It differs, only in degree, in different subjects. It is divided into acute and chronic, for the convenience of the practitioner, because the same quantity of the means of cure is not always required. Its long continuance does not always imply an absence of inflammation. There is an inflammatory chronic rheumatism, which is seldom cured for want of sufficient depletion, because it often requires as much depletion to remove it as the most acute cases. The difficulty arises from the organization of the parts principally concerned. This degree is found in the first stage in some persons, but is oftener the consequence of neglected evacuations.

Rheumatism is sometimes local and inflammatory, without any general fever, and can be cured by local evacuations. By high stimulation, a general sympathetic fever is sometimes excited. P.

We shall begin by the consideration of the highest grade of rheumatism, the rheumatic fever of the world, the acute rheumatism of nosologists, a painful and severe disease thus characterized. It is ushered in by a sudden attack of rigors, followed by the usual symptoms of pyrexia, and is particularly distinguished by the great pain and swelling which affect one or more joints, coupled with an utter inability to move them, and very commonly with considerable redness. The affected joints are acutely tender to the touch. The pains are aggravated towards night, and, for the most part, at all times, from external heat. The swelling, except in certain cases hereafter to be specified, does not take the form of the joint, but is diffused over the cellular membrane in its neighbourhood. Several joints are commonly affected at the same time, but one of the most singular phenomena of rheumatic inflammation is the strong tendency which it exhibits to *shift its situation;* to abate in one or two joints, often very suddenly, and to become as suddenly violent in another and a distant part.

The accompanying fever presents several important peculiarities. The pulse seldom exceeds 100 or 110 in the minute; but instead of the hardness which characterizes inflammatory fever, it is full, soft, and as it were *round.*

That the pulse is sometimes deceitfully soft, (for want of pressure) in acute rheumatism we are aware, but a critical examination will not authorise the epithet soft.

We think the author is not justified in asserting that "*any permanent injury is seldom done to the joint.*" It is here the inflammatory action is usually absorbed; but equally clear that the thickening of the fascia and ligaments often either impairs or destroys the use of the limbs. The deposition in the sheaths of the tendons becomes partly organized, and sometimes completely compresses the nerves; and the same process takes place in the ligaments, and paralysis in some degree ensues. There are cases in which the use of the joint as well as the muscles is utterly destroyed. This has been called paralytic rheumatism a superfluous name. Scrofulous subjects are the greatest sufferers in such cases. P.

The skin, instead of being hot, harsh, and dry, is commonly in a state of profuse perspiration; and a remarkable acid odour of its secretion may be noticed. The tongue is always deeply loaded. The papillæ appear elongated, and covered with a thick and abundant mucus. The functions of the brain are in a peculiar manner exempt. Head-ache is seldom present in any form of rheumatic inflammation, acute or chronic; and delirium is almost unknown. There is great thirst, but rarely any nausea or vomiting. The bowels are costive, though easily made to move. There is a sallowness in the aspect, and a peculiar expression of the countenance, sufficiently distinct from that of common febrile anxiety.

Different as are the local and constitutional symptoms from

those of other phlegmasiæ, the terminations of rheumatic inflammation are no less peculiar. The local inflammation may run high, but it never proceeds to suppuration. It is seldom, indeed, that any permanent injury is done to the joint; for if effusions of a transparent gelatinous fluid into, or around, the sheaths of tendons and the capsular ligaments, take place, they are commonly absorbed in a short time.

Sometimes in rheumatism the fever ceases suddenly, and large secretions of serum take place in the cellular membrane, in the head, or thorax; Storck relates a case, in which a tumour, equal in size to a man's head, formed near the scapula: on opening it a thick viscid gelatinous fluid was discharged; mild sudorifics, diuretics, and discutients had no effect; the wound by which the fluid was evacuated healed very slowly, and was best treated by an infusion of cicuta applied by cloths to the sores:

In the cases of effusion into the cavity of the pleura, the lungs are very much compressed; anxiety, difficulty of breathing, inability to lie down, sopor, loss of voice, a small, tremulous, unequal pulse, livid face, and cold extremities are the symptoms which distinguish it: An asthmatic cough appears and continues till death is produced by effusion into the lungs.* C.

DISPOSITION TO METASTASIS.

The most important consideration in this view of the subject is the disposition which exists in a state of acute rheumatism, to an affection of some internal organ by *metastasis*, or rather by extension of inflammation; for it is not often that the joints are relieved when this event takes place. The organ chiefly liable to be so affected is the heart, and it is from this occurrence alone that any danger in the progress of the disease is to be apprehended. The symptoms that result are those of common thoracic inflammation; the tendency to which, therefore, constitutes an important object of attention in the treatment of acute rheumatism. It has already been remarked, that the circumstances which lead to this extension of rheumatic inflammation to an internal organ have never yet been accurately investigated.

No disease is more liable to relapse on slight occasions than acute rheumatism. Going out a little too early in the open air, too much exercise of a particular joint, or an excess in diet, have frequently brought it back in all its former violence. Acute rheumatism is characterized also by a tendency to recurrence after a long interval. Those who have once suffered from an attack of the disease should therefore be particularly careful to avoid what we shall point out as its exciting causes, or to obviate them by proper attention to clothing. Rheumatism is certainly the most tedious of all the acute inflammations. In many cases it appears to run a defined course, which does not admit of being shortened by any process of treatment, and in a certain length of time to wear itself out. This is seldom less than a month, or

* Storck, Ann. Med. p. 119. Vienna, 1770.

longer than six weeks. That the acute sometimes terminates in a state of chronic rheumatism cannot be doubted; but, instead of being a frequent occurrence, as is often imagined, this is in fact rare; and though the recovery from genuine acute rheumatism is tedious, it is usually perfect.

CAUSES.

Children are very seldom the subjects of acute rheumatism. It most commonly occurs from the age of puberty to the thirtieth or thirty-fifth year of life, and chiefly affects those of sanguine temperament, robust form, and plethoric habit of body. It prevails principally in the months of December and January, and least frequently in August and September. Cold, with moisture, particularly where long applied, is certainly the most common, and perhaps it might be added its only exciting cause. Hence it is that we find it attributed, in a large proportion of cases, to sleeping in damp beds, living within damp walls, sitting in damp clothes, or working in damp situations.

SEAT.

Very little is known regarding the precise seat of inflammation in acute rheumatism. It appears to be situated primarily in capsular ligaments, tendinous sheaths, and aponeurotic expansions; but the cellular membrane around the joints probably partakes of inflammation in the active form of the complaint. In this, perhaps, consists the principal local distinction between acute and chronic rheumatism.

IN THE SYNOVIAL MEMBRANES.

In some instances of disease, not usually distinguished by the physician from those of common rheumatism, though known to the world by the name of the *rheumatic gout*, the swelling will be found to take the exact form of the joint, or of a bursa in its neighbourhood; and the affection is then simply *inflammation of synovial membrane.* By some pathologists it is imagined that such a disease is altogether distinct from rheumatism, and the term *arthritis* has been applied to it. It occurs both with and without fever. It appears to differ from rheumatism in its causes, progress, and treatment, as well as in its symptoms. It has been traced, for instance, to repelled gonorrhœa. It is frequently confined to a single joint, as the knee, or the elbow, and then commonly falls under the cognizance of the surgeon. It exhibits less tendency to shift its situation from one joint to another, and is more under the control of local remedies, than genuine, or as it may be called, *diffuse* rheumatism. As this subject however is very obscure, but still more,

as it has not yet received those illustrations which may probably throw considerable light upon the nature of the affection, I simply state the circumstances, without venturing an opinion on the pathological principles which they involve. Blisters are very serviceable in these synovial or bursal forms of rheumatism, and they may be applied as soon as the acute pain attending the first stage has subsided.

If an opinion were formed from the various, and even opposite modes of treatment which have been recommended in the common acute rheumatism, not upon theoretical grounds, but after ample and successful experience, it might rationally be supposed, that the disease occurs in the most opposite states of the system ; but this opinion is not borne out by the observation of symptoms. I believe the better conclusion to be, that acute rheumatism is at all times a tedious, and rarely a dangerous disease; that a large proportion of cases would recover with very slight care; and that, in many, medical treatment is of little further service than as obviating the tendency to internal inflammation. It cannot, I think, be doubted, with regard to the power of *cutting short* the disease, that a considerable difference exists between rheumatism and common inflammation.

TREATMENT OF ACUTE RHEUMATISM.

Three plans of treatment have been advised in the acute rheumatism. 1. The usual antiphlogistic system, consisting of bloodletting, purgatives, saline and antimonial medicines. 2. Opium and calomel. 3. Bark.

1. The authority of Sydenham is in favour of the first; and though it is impossible to call in question the very remarkable efficacy of opium, or of opium in combination with calomel, in many cases of this disease, yet the plan of treatment which that judicious physician employed, will be found, upon the whole, the most generally efficacious. The important distinction to be kept in view between the practice in acute rheumatism and that in other inflammatory affections is, that while in the latter, a continuance of the same symptoms calls for a repetition of the same evacuation, it does not do so in the former. To subdue rheumatic inflammation by the lancet alone (even if possible), would be to weaken the system unnecessarily; for it is to be remembered, that, in this disease, the inflammation is not in an organ essential to life. Sixteen ounces of blood may at first be taken from the arm ; and repeated two days afterwards, if the pain continues urgent. The blood will always be found highly cupped, and buffy. The further treatment of the disease may commonly be entrusted to purgatives, antimony, and nitre ; but venesection must again be had recourse to, if internal inflamma-

tion supervenes.* The following purgative draught, R. Infus. Sennæ Compos. dr. ix. Pul. Colchic. gr. viii. Tinct. Jalap. dr. ii. Syrup. mori. dr. i. M. f. haust. cathart., containing the

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* The more stimulating diaphoretics should not be used till after sufficient depletion: Then the following will be found valuable:

R. Ammon. subcarbon. gr. x. Pulv. antimon. gr. ii. Conserv. rosar. q. suf. f. bol. quart. hor. sumend.†

R. Seri lact. vinos. oz. x. Liq. vol. corn. cerv. gtt. xx. M. To be taken at night.‡

R. Mistur. camphor. oz. i. Liq. ammon. acetat. dr. iii. Liq. antimon. tartrit. gtt. xv. M. f. haust. quart. vel sext. quaq. hor. repetend.§

The use of the tartrite of antimony according to the Italian mode is a practice, which succeeds remarkably well in rheumatism. It is given in the dose of a grain every hour in small quantities of water; it is remarkable that in this manner twelve or fifteen grs. can be taken often in the space of twenty-four hours without vomiting: It may be substituted for bloodletting and with the best effects: It should always be tried in debilitated subjects; and as continued bleeding even in the robust often debilitates without subduing the disease, the plan by tartar emetic will be found to be invaluable.

Horn succeeded better with emetics than any other remedy; he repeated them every other day till fifteen to twenty were taken. Richter describes a kind of rheumatism which occurs in low marshy situations, and is connected with a bilious state of the stomach, in which emetics were very valuable: Other authors, Scudamore, Stoll, &c. also praise them.

The decoction of the bark and root of the aralia spinosa or prickly ash has been used with success as a remedy for rheumatism; it is a gentle sudorific. C.

In no case of rheumatalgia is opium admissible. It diminishes a morbid irritability pro tempore, at the expense of subsequent increased morbid excitement. The combination with calomel is not a much more eligible prescription. The colchicum is no better. None of them will succeed, and are only calculated to promote a temporizing inefficient practice. Bark has no place, in any inflammatory disease. P.

The effects of any narcotic given in the inflammatory stage of rheumatism, are, as Dr. Potter says, decidedly hurtful, till after the fever has been somewhat subdued; they should even then never be given when the paroxysm is at the highest, that is, in the evening; if they are, they produce delirium, anxious dreams, fatiguing sleep, with sudden startings, and slight delirious wanderings all the next day, a quick unequal small pulse, and an increase of the fever; Given however towards morning, they produce in these cases sleep, and do good. If spasms should come on in consequence of excessive pain, which sometimes is the case in this disease, then opium will be proper.

Bark may be administered in cases where the patient is greatly debilitated, and the pain returns at a regular hour, and particularly if a chill preceding it shows that it partakes entirely of the intermittent type: an ounce with nitre in divided doses may then be given during the apyrexia, with great benefit: The debility and its accompanying symptoms may by this means be entirely removed, though the pains are often not decidedly benefitted.

Decoctions of rosemary, chamomile, wormwood, sarsaparilla, in these cases have been also found useful. ‖

The rhododendron chrysanthum has been used with success: it is, according to Dr. Home, both a narcotic, sudorific, and sedative, reducing the pulse in some instances to 38 strokes in a minute.¶ it often effects a cure in three or four days, and has been much esteemed for a long time in Russia. They, as well as all other narcotics, are best given towards morning, when a remission of the pain and a disposition to sleep take place: then they do great good.

† Thomas. ‡ Ibid. § Ibid.
‖ Storck. Ann. Med. p. 121-2. ¶ Med. Comment. vol. v. p. 434.

powder of colchicum, will be found very effectual; and when the febrile symptoms have somewhat abated, advantage is derived from the following exhibition of the vinum colchici: R. Magnes. Sulphat. dr. i. Magn. ust. gr. xv. Vin. colchic. gtt. xxx. Aq. Menth. sat. dr. x. m. f. capt. quaq. sext. hor.; but it is in the subacute and chronic forms of rheumatism that the efficacy of this medicine is best displayed.

2. The power of opium, and of calomel in combination with opium, in repressing acute rheumatic inflammation, is unquestionably very great; and, under certain circumstances, it may be allowable to resort to them. It will seldom be found that calomel, even in large doses, affects the salivary glands, while the body is suffering under acute rheumatism.

3. Bark was introduced as a remedy in acute rheumatism, with the highest encomiums, by Dr. George Fordyce, and Dr. Haygarth; but as far as my observation extends, it has not answered the expectations which might have been formed of it from the testimony of these authors. It has appeared to me to be of use only in the latter periods of the disease, when considerable pain and stiffness of the joints are frequently found to exist, but with a *natural* state of the pulse and tongue.

In the true acute rheumatism local applications to the affected joints are of little service;—or rather, in most cases, of no service at all. This remark applies equally to fomentations, cold lotions, rubefacient liniments, and blisters. Not so, however, is it with regard to diet. In acute rheumatism, the functions of the stomach are often little impaired; but a free indulgence of the appetite protracts the complaint, frustrates the effects of other remedies, and has certainly contributed to give to rheumatism that character of tediousness, which makes it the opprobrium of physic. Broths and jellies, animal food in every shape, as well as wine and porter, are to be prohibited; and a cool, spare, vegetable diet strictly enforced.

With regard to the use of local applications, we think the remark of the author is by far too general: In the inflammatory forms, bleedings by leeches or cups are often extremely useful, and should be repeated till they have the desired effect.

Blisters, sinapisms, moxa; poultices of onions, garlic, horse-radish; frictions with acetic æther, with camphor dissolved in that substance; the tartar emetic ointment, all have a very valuable effect, after V. S. and particularly when the pain is not disposed to wander: The more mild rubefacients are also useful:

R. Spirit. Camphor. oz. iiss. Liquor. Ammon. oz. ss. M. f. liniment.

R. Ol. olivar. oz. ii. Spirit. volat. corn. cerv. oz. i. M.

R. Ol. oliv. oz. i. Terebinth. ol. oz. i. Laudan. oz. ss. M.

R. Ol. oliv. oz. ii. Camphor. pulv. dr. ii. M. et adde Liquor. ammon. oz. ss. et Tinct. lyttæ, dr. ii. M.

In applying these liniments the parts must be rubbed strongly with the warm hand, which greatly assists their effect: Flannel is necessary to be constantly worn next the skin; a waistcoat lined with brown paper has done much good.

The use of irritants to the surface is more particularly valuable when the pain is translated to the heart, stomach, head, &c.; then blisters put upon the parts from which it was translated, at the same time bleeding very freely, are indispensable.

A poultice of rye meal has been recommended in the following formula, as valuable to the local pains: R. Farin. secal. lb. i. Ferment. veter. acris, oz. iv. Nat. muriat. oz. ii. M. f. cataplasm. Renewed every morning and evening and applied round the affected joint, it is valuable. The application of cold by means of ice or spring water, is a measure which endangers metastasis too much to render it proper: The use of sulphuric æther, and æther and water, or spirits of camphor, seems to be more valuable as local remedies, because they excite the skin at the same time that they lessen the action of the vessels.

The application of the warm bath, the whole body being immersed for twenty minutes, or of warm water poured on the part affected, does also good in some cases. In old persons the warm bath of about 90° of Fahrenheit is very useful. It sometimes however renders the patient hot and restless; which the vapour bath never does, from the low temperature at which this latter produces perspiration. The use of vapour driven on the parts with force from a spout fixed to a boiler, has done much good in sciatica, lumbago, and other local rheumatisms.

Hot water from a spout, let fall from a height upon the part affected, is often useful:* They are called in France douches, and are used with great advantage at most of the watering places: At Bath, in England, exposure to a hot bath of 105° for 25 minutes, and repeated twice or thrice a week, and followed afterwards by pumping on the rheumatic part for ten or twenty minutes, has a fine effect in relieving ischias: A blister put on the hip often assists, the bath and pumping being omitted.

If there be fever, or increase of pain in the hip, cups should be applied, with purgative and Dover's powder at night: When the pain abates, the patient is exposed to a still colder bath, repeated for a few minutes every three or four days. The Russian vapour bath, which is formed by throwing water upon red hot stones in a room heated to about from 112° to 130° of Fahrenheit, does also good in some cases: The surface is irritated by whipping it with rods, and then the patient is immersed in cold water, and in winter in the snow: This experiment, however, is too dangerous.

Artificial vapour baths are now common; they are made by passing into a chamber made of canvass, a stream of vapour, to which the patient is exposed, sitting on a stool, for 20 or 30 minutes; after he leaves the bath, he dresses in flannel, and goes to bed: The vapour may be passed through leaves of aromatic herbs, as lavender, bergamot, &c.; indeed the odour of almost all kinds of medicines may be suspended in it: Persons whose chests are delicate, who are affected with aneurism of the heart or large blood-vessels, and who are asthmatic, should not use it. It should be so managed as to communicate the bath gradually from the feet to the head.

Frequently rheumatism produces great emaciation, dry cough, and night sweats, from the continuance of the pain; then nourishing diluents, as whey and milk, are useful.†

Sometimes in rheumatism the pains suddenly cease, and the body becomes stiff, the whole muscular system being immoveable, hard and swelled, so that not a joint can be stirred; the mind, speech, and expression of the face, respiration, and pulse, at the same time remaining perfect. Warm baths, dry cups to the spine, stimulating liniments rubbed over the whole body, with enemata to open the bowels, which are generally costive, will be found to relieve this form.‡ C.

* Thomas. † Storck, Ann. Med. p. 116.
‡ Storck, Ann. Med. p. 9–10.

CHRONIC RHEUMATISM.

Chronic Rheumatism is of constant occurrence, and this circumstance alone is sufficient to point out that it is not often the sequel of the acute form of the disease. It is characterised by pain of the joints aggravated on motion, stiffness of the joints, thickening of the several structures in their vicinity, or increased effusion into the synovial bags. It is readily distinguished from the acute rheumatism by the want of inflammatory fever, and of redness in the affected part. To this kind of affection the term *rheumatism* is, in common language, specially appropriated.

VARIETIES.

1. Three species of chronic rheumatism may be distinguished. The first is that which is connected with a state of febrile excitement in the system, and which would be more correctly designated by the term *subacute rheumatism.* It is known by the pains occasionally shifting their situation suddenly, as in the acute form of the disease, and by their being increased by warmth, and especially, at night, by the warmth of the bed. The frequent occurrence of œdema along with the affection of the joints, may serve to distinguish this from the other species of the disease. Those joints which are surrounded by a large mass of muscular substance, and which are most constantly exerted, are especially liable to it, such as the hip, and the joints of the lumbar vertebræ. This state of chronic rheumatism is accompanied with a white tongue, thirst, a quickened pulse, and a costive state of the bowels.

In cold and moist climates and seasons, this variety of rheumatism is common, and appears after exposure to cold air, particularly if it be moist; drowsiness, chills, slight nausea, with a dull pain in the head, precede it for a day or two; these give place to pains in the shoulders, loins, or any other part of the body formerly attacked; often the pulse is not in the least accelerated, and after the disease continues for some time it is followed by paralysis.*

2. The second species of chronic rheumatism is marked, not by any degree of excitement in the system, but by the absence of constitutional symptoms. Here it is not unreasonable to believe, that there may be a loss of tone in the vessels of the affected part. It is not so common as the preceding species, but it sometimes follows it. Stiffness of the joint is here the prominent symptom. *Pain,* in this form of the complaint, is often not at all felt except on motion, or on occasion of changes in the heat or moisture of the atmosphere. It is relieved rather than increased by the warmth of bed. The pain and stiffness do not

* Sims on Epid. Disord. p. 72. Lond. 1773.

shift from joint to joint. Spontaneous coldness of the limb, and even a degree of paralytic torpor, are often complained of by the patient. The pulse is seldom quick, or the tongue white.

3. The third species of chronic rheumatism is attended with permanent derangement in the structure of the joint; and it is that form of disease which has been ably described by Dr. Haygarth, under the title of Nodosity of the Joints. The ends of the bones, the periosteum, and ligaments become thickened; and nodes form upon them, often to such an extent as to distort the joint in the most unsightly manner. This form of rheumatism chiefly affects the fingers, but I have seen it also in the knees and ancles. It is principally met with in women, after they have passed the period of menstruation. It is attended with pain of the joint, particularly severe at night.

CAUSES.

The usual causes of chronic rheumatism are exposure to cold and moisture, or to partial currents of air; local injuries, such as strains and bruises; and it is also one of the common effects of the syphilitic poison, and of mercury. The structures affected in chronic rheumatism are those called by Bichat, *fibrous:*—viz. the periosteum in every part of its extent, the tendons and tendinous sheaths of muscles, the ligaments around the joints, the investing membranes of the nerves and of the teeth, and not unfrequently the substance of muscle itself. The sclerotic coat of the eye, which has a dense structure of an analogous kind, is subject also to a species of *rheumatic* inflammation. To distinguish this affection is by no means easy; nor is this the only instance in which chronic rheumatism has given occasion to difficulties in diagnosis. Lumbago has been mistaken for nephralgia or lumbar abscess; rheumatism of the intercostal muscles for pleurisy; and sciatica for ulceration within the cavity of the acetabulum.

TREATMENT.

No general rules of much importance can be laid down for the guidance of the student in the treatment of chronic rheumatism. Some attention must be paid to the state of the constitution, as directed in page 288, and perhaps more can be done in that way towards the relief of the complaint than is generally supposed; but the remedies, both internal and external, must be varied according to their effects, and the particular circumstances of each case. Instead, however, of a bare enumeration of the remedies that have been tried and occasionally found useful in chronic rheumatism, it may be advisable to attempt, at least, to point out a few principles that may prove of general application.

1. In some of the forms of sub-acute rheumatism, particularly

lumbago and sciatica, the local abstraction of blood by cupping will be productive of great benefit. Where the pains are very severe, it may even be necessary to take blood from the arm, which in this state of disease will always be found cupped and buffy. Leeches are well adapted to those cases of chronic rheumatism, where there is pain and swelling of a joint from distension of the synovial membrane. Dr. Haygarth recommends their application where an enlargement of the extremities of the bones has taken place.

In that form described in page 491, which comes on with chills, sickness at stomach, and other symptoms of general fever, a continued use of antimonials in small doses, as James' powder, tartar emetic, or volatile tincture of guiacum, united with the antimonials, as equal parts of volatile tincture of guiacum, and antimonial wine, given at night in the dose of a tea spoonful; balsam copaiba, oil of turpentine,* sweating by means of the vapour bath, or a hot stove, also succeed. This may be made by seating the patient upon a low stool, placed in a vessel containing boiling water; the body is then covered with a sheet fastened round the neck and hanging down over the vessel; the patient is kept in it for several hours, till faintness is induced, and then wrapped in flannels to prolong the sweat, with the best effects.† A slight salivation is also useful.

2. The cure of chronic rheumatism may occasionally be effected by promoting diaphoresis. This mode of treatment is adapted to those cases where there exists some degree of febrile excitement, where the pains are of recent date, and shift from one joint to another. The warm bath may be directed twice in the week (provided the pulse be perfectly free from all activity), and the following diaphoretic draught, R. Mist. camphor. dr. vi. Liq. ammon. acet. dr. iii. Pulv. ipecac. compos. gr. vi. M. f. haust. sext. hor. sumend., consisting of the liquor amm. acet. and small doses of Dover's powder, given repeatedly during the day. It is unnecessary to add, that neither in this, nor in any other form of chronic rheumatism, can any thing be hoped for without proper attention to clothing, and above all, the use of flannel as an under dress.

3. In the same description of cases which are benefitted by diaphoretics, the vinum colchici may be had recourse to with great advantage. Where there is any considerable degree of effusion, either within the capsular ligaments or the bursæ, or where the cellular membrane in the neighborhood of the joint is œdematous, I think that I have seen the colchicum particularly useful. This form of draught may be recommended: R. Mist. camphor. oz. i. Vin. Colchic. dr. ss. Liquor. ammon. acetat. dr. ii. M. f. haust. sext. horis sumend.

The system soon becomes saturated with colchicum, and then small doses produce a great effect: nausea, vertigo, loss of appetite, show the proper point to stop it. Its dose is from five drops to two drachms of the tincture.

* Sims on Epid. Disord. Lond. 1773. p. 74. † Ibid. p. 74–5.

Occasional purging (twice or even three times in the week) by senna in union with salts, or with the powder of colchicum, should never be omitted. R. Infus. senn. composit. dr. ix. Pulv. Colchic. gr. viii. Tinct. Jalap. dr. ii. Syrup. mor. dr. i. M. f. haust. cathart.

R. Infus. senn. compos. oz. i. Magnes. sulphat. dr. ii. Tinct. senn. Tinct. Jalap. Syrup. sing. dr. i. M. f. haust. I have seldom experienced much benefit in this complaint from the exhibition of antimony.

4. Where great torpor and debility of the general system prevails, stimulant and tonic medicines of different kinds have been administered with advantage, the principal of which are gum guiacum and the volatile alkali, or their combination, the volatile tincture of guiacum, the oil of turpentine, the balsam of Peru, and mezereon. Bark, both in the form of decoction and powder, unquestionably possesses considerable power over certain forms of chronic rheumatism, attended with general torpor; and arsenic has proved successful, even when the *structures* about the joints had become partially disorganized. The good effects of all these remedies will be considerably aided by the diligent use of stimulating embrocations (such as the compound camphor or soap liniment), friction alone appearing to be a powerful means of exciting the languid action of the vessels. The following formula is strongly recommended by Dr. Bardsley: R. Liniment. sapon. oz. ii. Camphor. dr. i. Liquor. ammon. Tinct. cantharid. Tinct. opii, sing. dr. ii. M. f. liniment. In all cases of chronic rheumatism of long standing, permanent stiffness of the joint is chiefly to be dreaded, to which nothing contributes so much as neglect of the due exercise of the joint. To this, therefore, patients should always be encouraged, as a matter of great consequence with a view to their ultimate recovery.

5. Mercury, pushed so as to affect the mouth, is very effectual in the cure of rheumatic affections of a chronic nature. It appears to operate as a general *stimulant*. The best mode of administration is five grains of the blue pill taken night and morning. In many of these cases it has been supposed, that a syphilitic taint may have existed in the constitution and kept up the disease; but very frequently there is no foundation for such a suspicion. Where rheumatic pains can be traced to cold while the system was under the influence of mercury, decoctions of sarsaparilla, guiacum, and the elm bark, the powder of sarsaparilla in doses of two drachms three times a day, with other vegetable alteratives, may be tried with a reasonable prospect of advantage.

6. No one remedy, perhaps, is of such general application in the treatment of chronic rheumatism as local warm bathing. In that severe form of the disease which has been called nodosity

of the joints, scarcely any thing else can be relied on to soothe pain and relax the rigid fibres. The efficacy of the waters of Bath and Buxton, even in very obstinate cases, is generally acknowledged. They are applicable, however, only in that species of rheumatism which is unattended by inflammatory excitement.

The temperature of the Buxton bath is barely sufficient to give some degree of cold on first going into it. The cases in which it is useful are known by the absence of pain, on growing warm in bed. Sea bathing, or the common cold or shower bath, after the use of the Buxton bath, confirms the cure.

The cold or shower bath should not be used in cases where there is any fever; and it will succeed best in those cases which are better after exercise, a full meal, or the use of stimuli, circumstances proving the absence of fever.

The use of the flesh brush, of frictions with flannel, shampooing, and afterwards warm clothing should follow the bath.

Bandages of flannel rolled round the limb, so as to compress it completely, and equably applied from below upwards, have been advised by Dr. Balfour of Edinburgh; they were very tightly rolled at first, and then loosened; followed by friction and percussion, applied so as to excite the surface, and then the bandages were again put on. With the warm bath this plan succeeded perfectly.*

Friction, in particular, is valuable where there is great swelling of the joints: It may be applied by means of flannel or the flesh brush.

The introduction of a needle gradually into the flesh, into the part pained, called acupuncturation, has succeeded in relieving the pain in a moment. It is sometimes followed by fainting, or an abscess in the part. In general the relief is instantaneous. The pain, however, recurs in a few days from the general morbid action not being subdued: Bleeding, and purging, followed by the use of the acupuncturation, will be useful.

Garlic, horse-radish or mustard seed, bruised so that the gastric juice may act upon it; also wine whey, and generous living, are valuable where the disease is entirely chronic, without any mixture of acute symptoms.

Compression of the large arteries by means of a tourniquet has been advantageously used in severe rheumatism.†

The use of the Fowler's solution, in the dose of ten drops thrice a day, is often valuable, particularly in the old and feeble; soreness of the mouth, ptyalism, erythema on the surface, a costive state of the bowels, great irritability of the stomach ensue from the use of this medicine; after omitting it for a few days, it may be resumed with a good effect.

7. In all cases of chronic rheumatism, *pain* is, if possible, to be relieved; and, generally, opium will be found the only effectual resource. Ten, or even fifteen grains of Dover's powders should be given every night at bed-time. Opium taken at night in conjunction with calomel, is particularly serviceable when the pulse and tongue give evidence of general vascular excitement. Where opium disagrees with the system, the extracts of conium or hyosciamus may be substituted: R. Extract. hyosciami, gr. iv. Hydrargyr. submuriat. gr. i. f. pill. omni noct. sumend. The costiveness which all narcotics occasion is to be

* Ed. Med. and Surg. Journal. Balfour on Rheumatism.
† Duncan's Annals. 1801.

carefully obviated by some aperient taken the following morning: R. Confect. senn. oz. i. Sulphur. loti. oz. ss. Syrup. tolut. q. suf. ft. electuar.—sumat duo vel tria cochlearia minora omni mane.—R. Decoct. aloes compos. dr. vi. Aq. cinnamom. dr. iv. M. f. haust. omni meridie sumend.

SCIATICA.

There appears to be something peculiar in the pathology of that variety of rheumatism termed SCIATICA. It is conjectured, that in this disease there is a degree of inflammation present either in the substance or in the cellular envelope of the great sciatic nerve. It is attended with excruciating pain, extending down the thigh, particularly urgent about two or three o'clock in the morning. It occurs chiefly in persons of robust habit; and it is, in almost all cases, extremely tedious. The neuralgic affection called ischias nervosum, closely resembles it in many of its features. Cupping, blistering, and active mercurial purgatives long and steadily continued, are required for its cure; with opium, in doses proportioned to the severity of the pain. In obstinate cases, an issue should be directed. The application of the *moxa* has occasionally given relief, and as a last resource, is certainly worthy of a trial.

LUMBAGO is the rheumatism of the lumbar vertebræ, or rather of the large masses of muscular substance attached to them, and serving for the support of the body. It is distinguished from nephritis by the aggravation of pain on stooping. It is a less violent form of ailment than the preceding, and yields, for the most part, to strong, stimulating embrocations: R. Liniment. sapon. oz. ii. Camphor. dr. i. Liquor. ammon. Tinct. cantharid. Tinct. opii āā dr. ii. M. f. liniment.;—active aperients, R. Infus. senn. compos. oz. i. Mag. sulphat. dr. ii. Tinct. senn. Tinct. Jalap. Syrup. sing. dr. i. M. f. haust.;—and Dover's powder, in full doses, taken at bed-time.

Rheumatism of the thoracic parietes is called PLEURODYNE, or bastard pleurisy. It is to be distinguished from true pleurisy by the character of the pulse, and the absence of constitutional derangement. It is a very transient form of rheumatism, best combated by the warm bath, and frictions with soap liniment and laudanum.

CRURITIS, OR PHLEGMASIA DOLENS.

This disease most frequently attacks lying-in women, a few days after delivery; and consists of a tense, elastic, painful pulse, white swelling about the upper parts of the thighs, buttocks, nates, &c. extending most commonly to the labium pudendi upon one side.

By some it has been attributed to an inflammation of the lymphatics, produ-

ced by the irritation and pressure of the head of the child during delivery; by others to an inflamed state of the veins; Dr. Davis, of London, has discovered these vessels inflamed, filled with effused coagulable lymph; their coats thickened, adhering to the cellular substance below; and lastly converted into a ligamentous structure, so as to be incapable of performing their functions.

Our distinguished countryman, Dr. Hosack, considers this disease as a general inflammatory affection of the whole limb, affecting all its various structures; and this we believe to be its true pathology: He considers that it is not confined to the lymphatics, nor is it produced by pressure of the child in delivery. Stiffness, weight, pain, increased on motion, are usually felt previously to the attack. These are followed by rigors, and fever, as in the other phlegmasiæ. The swelling and pain increase till they occupy the whole thigh, leg, and foot, which are pale, tense, and do not yield to the pressure of the finger; on puncturing it also no fluid is discharged.

In general in about a week the pain and swelling decline; the leg becomes covered with inequalities, owing to the absorption of the matter in different parts of the limb; the pain, heat, redness, gradually decline with the fever; leaving the patient weak, and the extremity swelled, heavy, and numb, unusually sensible to cold, and more easily fatigued on exercise ever after.

The extravasated fluid is gradually absorbed, as the disease declines; it rarely terminates in gangrene, suppuration, or death, though it does sometimes when proper depletion has been neglected.

It is generally produced by exposure to cold, by changes of dress, by a suppression of the natural excretions, or by stimulating drinks.

It is to be treated by venesection, saline purgatives, rest, antimonials, cool air, with diaphoretic anodynes at night as the pain and fever abate.

Leeches and cups should be applied to the seat of the pain; or cold lotions, of saccharum saturni, muriate of ammonia; and as soon as all symptoms of inflammation have disappeared the limb should be wrapped in a flannel roller, or laced stocking; frictions with the flesh brush or flannel should be applied to the surface; the immersion of the limb in tepid salt water has also been found useful.* Cold bathing, by water poured or dashed upon the parts, has been found very serviceable. Sometimes warm bathing also has a salutary effect: Opiates should be given to allay irritation as soon as the inflammation has subsided.

According to Burns, the disease is not inflammatory. The indication to be pursued, according to him, should be to support the strength and palliate the symptoms. When the pain shifts, he advises bark and calomel. It is evident from the dissections of Dr. Davis that Mr. Burns has taken a partial view of the disease, and that the depleting plan above mentioned is the only proper one; Mr. Burns' patients may have escaped, as the disease is seldom fatal; but it is clear that the most correct plan of treatment is the antiphlogistic in its most rigorous and determined manner.

For a more full account of this disease, see Hosack's Essays.

* Thomas, p. 871.

CHAPTER XVIII.

OF THE GOUT.

Its Pathological Connection with Rheumatism—Division into Acute and Chronic Gout—Symptoms of Acute Gout—Of Chronic or Irregular Gout—Predisposition to Gout—Exciting Causes of Acute Gout—Proximate Cause of Gout—Principles of the Treatment of Gout.

ITS PATHOLOGICAL CONNECTION WITH RHEUMATISM.

Gout is a disease, which, though possessed of many peculiar characters, is yet intimately associated, in a pathological view, with rheumatism.* It is scarcely, indeed, two hundred years

* Gout is not so nearly allied to rheumatism as some pathologists have imagined. Their remote causes are different. The predisposition to rheumatism is not hereditary;—the secretion of the urate of soda is not to be found in rheumatism. The stomach is primarily or secondarily affected in most cases of gout, and during the intervals often manifests the symptoms of dyspepsia. In rheumatic fever, or after it, the stomach is less concerned than in any disease of the same violence. Rheumatism can be eradicated by antiphlogistic measures, and in many instances never will return. Gout can be controlled for a time, by similar means, but the predisposition still exists. The condition of the nervous system seems to be different in these diseases, although the inflammation invades the same organizations. Whether gout be hereditary or acquired, the first cause imparts an exquisite constitutional sensibility to the nerves of the ligaments and tendons, and this is transmitted from one generation to another. This extreme sensibility resides principally and primarily in the stomach of some gouty persons, but not in others. In rheumatism, the accumulated excitability under a low temperature is incidental, transient, and constitutes no part of the temperament of the patient's progenitors. The exciting causes are usually the same, but it is the remote cause that gives the character to diseases, except so far as they are modified by a difference of organization. No degree of intemperance, nor indulgence in sensual gratification will engender a rheumatic pain, but this cannot be predicated of gout. On the contrary a low temperature (which is the legitimate remote cause of rheumatism), cannot produce a solitary twinge of gout, unless a predisposition already exist, and there it can only act as an exciting or assistant cause.

Pathologists do not seem willing to include the muscles in the sufferance of rheumatism. They are certainly found participating, both by extension of inflammation, and as parts primarily invaded. They are often spasmodically

since they were first accurately distinguished.* But though the diagnosis is very important, and has contributed essentially to the elucidation of this branch of pathology, still it must not be forgotten, that a close affinity subsists between these diseases, that they run into each other by insensible degrees, and that the term *rheumatic gout*, so frequently employed in common life, is at the same time strictly scientific. The general features of resemblance between gout and rheumatism may be traced in the identity of the structures which are attacked, in the similarity of the terminations of the two diseases, and in their mutual tendency to affect some internal organ by metastasis. The leading points of difference are to be found in the joints principally affected, in the progress of the symptoms, in the *predisposing*, and lastly, in the *exciting* causes. All these are well expressed in Dr. Cullen's excellent definition of gout. It may fairly, indeed, be admitted, that no subject in the whole extent of medical science has been investigated with such attention as the gout; and by no one certainly has that investigation been prosecuted with so much success as by Dr. Cullen.

The author should have awarded here to Dr. Scudamore the praise which is justly his due, and in giving the diagnosis of rheumatism he might have mentioned more specifically that gout attacks suddenly and affects the smaller joints, whilst rheumatism appears in the muscles and the larger ones; that the gout has its origin in excesses of eating and drinking; rheumatism in cold; that the gout is hereditary, but the rheumatism is not so likely to be so. The affection of the stomach which precedes gout, rarely does rheumatism; the inflamed joints are more red and swelled in gout than in rheumatism; and in the former, the pains are gnawing and less inclined to shift, and when they do, they fly to the corresponding one on the opposite side, or to one near it.†

Gout is distinguished from erysipelas by being confined to the joints, whereas erysipelas attacks only the skin and cellular membrane; is preceded by fever, is unconnected with any disease of the stomach and alimentary canal, which characterise the gout; the pain also in gout is more intense than in erysipelas; the joints cannot be moved easily, whereas in erysipelas motion is effected without difficulty: The rapid extension, blistering and desquamation in erysipelas are also a sufficient ground of diagnosis.

The distinction between chronic gout and chronic rheumatism, is often impossible. The predisposition, the habits, the state of the organs of digestion, the existence of gravel in the family, the confinement of the pains to the smaller joints, where it is followed by œdema, will often characterise the gout sufficiently, and distinguish it from any form of rheumatism. C.

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affected in gout, but not by inflammation, if we are to judge from the observation of a great number of examples. The pain in a rheumatic muscle is not always communicated from a tendon below, but sometimes begins in the muscle. None of the soft solids are exempted from inflammation from cold; who will assert that the intercostal muscles are not sometimes the seat of rheumatism? P.

* The term *rheumatism* was first employed, and the disease separated from the *arthritis* of old authors, by Ballonius, in his Treatise "De Rheumatismo et Pleuritide dorsali." 1642.

† Thomas.

ACUTE AND CHRONIC GOUT.

Gout, in its regular form, is a genuine inflammatory affection of the fibrous membranes, running a defined course and attended by the common symptoms of inflammatory fever. This is the regular or acute species of the disease. In a large proportion of cases, its attack is confined to a single joint, and that one, the first of the great toe. But as in other inflammatory affections, there is here also a chronic form of the complaint, called in common language the *irregular* gout; and to this a third variety may be added, which occasionally supervenes upon both the other species,—I mean the *retrocedent* gout, where a metastasis takes place to some internal organ, giving rise to symptoms either of visceral congestion or of inflammation.

SYMPTOMS OF ACUTE GOUT.

An attack of acute gout sometimes comes on suddenly, without any warning, but for the most part it is preceded for two or three days by symptoms indicating general disturbance of the system. The principal of these are lassitude with depression of spirits, coldness of the feet and legs, numbness, with a sense of pricking or itching in the lower extremities, cramps of the muscles of the legs, an irritable state of the bladder, but chiefly a great degree of disturbance in the functions of the stomach. There are present also, symptoms of fever; such as disturbed sleep, scanty and high-coloured urine, cough with expectoration of mucus, and a costive state of the bowels. The attack of local inflammation commonly takes place about two or three o'clock in the morning, with more or less shivering, succeeded by the common symptoms of pyrexia, and almost always with intense pain of the joint. In a few hours the joint becomes swelled and red, and very painful to the touch. The feverish symptoms continue for three or four days, generally exhibiting the usual exacerbation towards evening. The redness and swelling then gradually abate; and as the disease wears off, it leaves the patient, not as in a common fever, weak and debilitated, but enjoying better appetite and better spirits, than he had experienced for some time before.

But this is only a *paroxysm* of gout. The disposition to recur, frequently too at regular intervals, constitutes another, and a most important feature of the disease. By degrees these intervals become shorter, and the paroxysms themselves more severe; and while the constitution falls more and more under the influence of the disease, it makes corresponding encroachments in respect of the parts which it attacks. At first, it confines itself to a single joint of one foot; by degrees it affects several joints, and both feet, either together, or in succession; and at length

its ravages extend to every joint of the body. When it has subsisted for a certain time, a saline matter is thrown out by the inflamed vessels, and deposited upon the periosteum, the ligaments of the joints, the cellular membrane around them, the bursæ mucosæ, and even in some cases between the cutis and cuticle*. This accumulates after repeated paroxysms, so as to obstruct, during the intervals of health, the motions of the joint, and, when fresh inflammation supervenes, to aggravate very considerably the sufferings of the patient. It is sometimes effused in such quantity as to occasion concretions of a large size, tedious ulcerations about the joint, or even complete anchylosis. The matter has been found, by analysis, to consist of the urate of soda. For this discovery we are indebted to Dr. Wollaston.†

CHRONIC GOUT.

In the chronic or irregular gout, the symptoms do not follow that defined course which is witnessed in the acute species of the disease. The appearances of external inflammation are slighter, but there is equal or even more œdema, and always so much weakness of the neighbouring muscles, that the motion of the joint is greatly impaired. Sometimes it leaves the joint first attacked, and fixes on some distant part; or, after harrassing the patient by affecting different joints in succession, returns to that in which it was originally seated. With these local symptoms are conjoined a variety of others, indicating general constitutional disturbance, such as feelings of languor and dejection, cramps in different parts of the body, particularly distressing at night, palpitation, costiveness, heartburn, a chronic cough, and in the worst cases, wasting, and that general depravation of the whole habit which is commonly called *cachexia.*

The retrocedent gout is that form of the disease, where, during the existence of the more usual symptoms, some internal organ becomes affected. The stomach, intestines, heart, and brain have at different times been observed to be the seat of retrocedent gout. Some differences of opinion exist as to the precise nature of the affection in cases of this kind. The symptoms, in many instances, warrant the suspicion of *inflammation*; but it is doubtful if this holds good, when the stomach or the brain are attacked.

There are some who never experience gout, except in the inflammatory form, even in old age. In such persons we find the action of the heart, (as manifested by the pulse,) strong, and usually slow, in the intervals, but in-

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* Vide "Moore on Gouty Concretions or Chalkstones." Med. and Chir. Transactions, vol. i. page 112.

† Philosophical Transactions, 1797.

creased in frequency in the paroxysms. We think these affections of the brain and stomach always more or less inflammatory, and in this opinion we are corroborated by the accompanying indicatives, of the state of the skin, tongue and secretions generally: We have drawn as much blood in a few hours in a gouty inflammation of the brain and stomach as in any other disease, and sometimes with as happy effects. It is nevertheless true, that it must be done early to be useful, and it is not less certain such may be the impaired state of the vital functions, that we cannot subdue the disease without exhausting the patient. The dilemma is embarrassing: if we bleed freely, we may succeed: if we do not, the patient must die. It would scarcely be possible to mistake spasms of the stomach for this state. P.

The gout, when it appears in these different organs, personates all the forms of disease to which they are subject: The stomach is affected with colic, cholera, dyspepsia; the intestines with diarrhœa, griping, tenesmus, &c.; the heart, with palpitations, &c.; the brain, with apoplexy, epilepsy, &c. C.

PREDISPOSITION.

There are several very important considerations connected with the causes of gout, predisposing and occasional; and among them the first in point of pathological interest is the influence of *hereditary predisposition.* This principle is now for the first time brought under consideration, but it is one of extensive application, and will hereafter be adduced to illustrate the pathology of some of the most important diseases of the body, such as hæmoptysis, scrofula, epilepsy, mania, and asthma. It may be stated as a general principle, that such an hereditary predisposition as we have supposed to exist, both with regard to these diseases and to gout, may be assisted by different circumstances, or it may be so far counteracted by others, as that it never shall exert during life any influence in the production of disease. Persons too, without hereditary disposition, may *acquire* the gout, or any other of the complaints associated in this respect with it; so that, as a doctrine in pathology, it must be received with limitations; but it is not on that account the less certain or important. Hereditary predisposition is greater or less, according as it is on the side of both parents, or of one only. Attempts have been made to estimate the proportion which the cases of acquired gout bear to those where an hereditary tendency can be traced; but the calculations that have hitherto appeared are far from being satisfactory.

Gout chiefly prevails among men. This is not to be ascribed to any peculiar exemption which the female sex enjoys from gout, but to a difference in those habits of life which contribute to the development of the disease. Where the gout appears in women, an hereditary predisposition to it will probably be met with, both on the father's and the mother's side. A gross and corpulent habit of body, with fulness of the veins, and a relaxed or loose state of the solids, is observed to give a tendency to gout. The same remark, however, may certainly be extended to acute rheumatism. The exemption of youth from gout is a

striking character of the disease, as was long since urged by Hippocrates. Dr. Heberden*, whose experience in gout was probably more extensive than that of any physician who ever lived, never saw an instance of the disease before puberty. It seldom, indeed, appears before the age of thirty-five.

But of all the circumstances which give a tendency to gout, next after hereditary predisposition, the most important are, full living, and especially the free use of animal food,—an habitual indulgence in wine, and inactivity of body. The gout, therefore, is almost wholly unknown among persons employed in constant bodily labour, and chiefly supported upon vegetable aliment. It has been attempted, by several writers, to estimate the relative degree of importance which should be attached to each of these three predisposing causes of the disease, and pathologists generally attribute to the free use of *wine* the principal share in the production of gout. Van Swieten states, that the gout was unknown in Holland till wine was substituted for beer. This doctrine, however, admits of some doubt. The disease occurs frequently in certain classes of persons in this country, where an indulgence in animal food and inactivity of body can alone operate. I am inclined to think, therefore, that these, if they have not a superior, have at least an equal share in the production of gout in the upper ranks of life. They all concur in producing that plethoric state of the body, on which the predisposition to gout appears mainly to depend.

EXCITING CAUSES.

The exciting causes of the gout, or those which more immediately bring on a paroxysm, are such as in a plethoric habit of body induce a state of weakness, or irritability. Of these the most common are indigestion, produced either by the quantity or quality of the aliment; intemperance, particularly in the use of *acescent* wines, such as champaign and claret; excess in venereal pleasures; intense application to study, with night watching; mental anxiety; excessive evacuations; cold, especially when applied to the lower extremities; severe exercise, so as to occasion fatigue; sprains and contusions; and lastly, very sudden changes in the manner of living, not only from a low to a full diet, but what is important also in practice, from a full to a very spare diet.

Depletion may give rise to gout in those who have been often worn down by the disease, but it occurs so rarely from such a cause, even in the predisposed subject, that it makes no figure in the list of exciting causes. P.

* Commentarii de Morbis, page 33.

PROXIMATE CAUSE.

The *proximate* cause of gout has been studiously investigated by almost every writer on the disease. The favourite doctrine has been, that gout depends upon a certain morbific matter, always present in the body, which thrown out upon the joints, or other parts, produces the several phenomena of the disease. By some, even of the latest writers on gout, this theory has been supported, and the morbific matter has been pronounced to be an *acid*. Many ingenious arguments have been brought forward in its favour, but the doctrines of the *humoral* pathology have fallen into oblivion, and in this instance, at least, scarcely merit revival. With respect to the analogy between gout and gravel, sufficient evidence has been adduced to render it probable that a pathological connection really subsists between these diseases; but its precise nature is not ascertained.

That gouty subjects, especially in advanced life, are more liable to calculous concretions than others will not be denied. As the kidneys are among the organs frequently invaded by gout, the secretory action is often to be observed; but as others, not tainted by gout, experience the calculous diathesis, it is difficult to determine whether the disease be strictly gouty or the ordinary result of a similar degree of inflammation from other causes. We imagine the chemical analogies of calculi would be found to be the same; but if the result should demonstrate that they are composed of the urate of soda, it would prove our opinion to be erroneous. We cannot subscribe to the author's opinion respecting "*the paroxysm of local inflammation.*" We are convinced, from reiterated observation, that the judicious management of the case, by attending to the general system and local affection, will not only abridge the paroxysm but defer future attacks; more especially before the repeated recurrence of the disease shall have augmented the predisposition. P.

A regular fit of the gout is so far from being a disease of danger, that it is considered by many as the precursor of health and strength. It would be, perhaps, fortunate for gouty persons if there were less foundation for this opinion; for, under such an impression, a system is too often pursued, which, in the first instance, rivets the disease in the constitution, and ends by undermining it. The principles of treatment in gout are different from those which obtain in other inflammatory affections. The paroxysm of local inflammation, not being attended with danger, may be to a considerable degree disregarded; while the efforts of the practitioner should be steadily exerted, during the intervals of the paroxysms, to prevent their recurrence, by a due attention to the predisposing and exciting causes.

TREATMENT.

In a paroxysm of acute gout, the antiphlogistic regimen is to be enforced, the bowels are to be kept open by cooling laxatives,

and saline draughts may be given at proper intervals: R. Infus. Senn. dr. xi. Pulv. Colchic. gr. viii. Tinct. Jalap. dr. ii. Syrup. Mori. dr. i. M. f. haust. cathartic. The efficacy of colchicum, in checking the first approach of a fit of the gout, and moderating its violence when it has come on, is established by very ample observation. For this purpose, either a drachm of the vinum colchici, or a proportionate dose of the *Eau Medicinale*, may be given at once, or these draughts, at proper intervals:* R. Magnes. Sulphat. dr. i. Magnes. ust. gr. xv. Vin. Colchic. gtt. xxx. Aq. Menth. sat. dr. x. M. f. haust. Sext. quaq. hor. adhibend.

R. Mist. camphor. oz. i. Vin. Colchic. dr. ss. Liquor. ammon. acetat. dr. ii. M. f. haust. sext. horis sumend.

It is seldom that general measures of greater activity than these are called for.

Emetics often relieve all the symptoms of inflammatory gout, when taken early: They may be used in those cases where, from previous excesses or debility, we are afraid to bleed; a furred tongue, nausea, acidity indicate them more particularly.† Twenty grains of ipecacuanha, or a solution of tartar emetic, in the dose of the one-sixth of a grain every fifteen minutes till it operates may be given· Predisposition to apoplexy, inflammation of the stomach contra-indicate them.

Dr. Rush states, that a fit of the gout was suspended in a British officer by

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* Rest, freedom from noise, irritation, both mental and bodily, must be advised; farinaceous substances, as arrow root, barley water, whey, sago, panada; diluents, as weak tea and coffee; roasted apples, should form the diet, except the patient be aged, very much debilitated by frequent attacks, or of a broken down constitution, when it will be necessary to give something more cordial; as, animal food, with madeira or sherry wine, which are less liable to become acid on the stomach than any other. All acids are to be avoided, as they render the gout retrocedent.

When the person is young, and the habit plethoric and inflammatory, the pulse full and hard, the local inflammation considerable, venesection from the arm will be required; recollecting always that in this disease the temperament is more or less nervous, and will not bear depletion in the same degree as in other inflammatory affections. If the liver, kidneys, bowels, or head are affected with inflammation, then large quantities of blood must be taken, particularly if the system be vigorous, young, and plethoric; Dr. Rush took 60 ounces in one case; Sir John Floyer cured a man of palsy from the gout by frequent bleedings: In taking away blood the most unequivocal signs of inflammation must be present, and if there be any doubt with regard to the nature of the case, it may be drawn locally by leeches or cups, and the quantity be gradually taken: The blood should be taken early; Wine whey or ginger tea may be administered if a disposition to translation be feared; Tenderness on pressure on the hypochondriac region, fulness of the head, or any local pain is a sufficient reason for the application of leeches or cups.

The pulse is equally various in the gout as in other inflammatory diseases, and the results of blood-letting are equally favourable in preventing effusion, and in diminishing congestions, &c. C.

† See Eberle's Mat. Med. p. 25. vol. i.

the early use of an emetic; Scudamore gives an instance of the same nature: Ipecacuanha should be preferred.

Sudorifics are often useful, particularly towards morning, and in the decline of the paroxysm; all saline medicines of this nature should be avoided: Wine whey; bitter teas, as chamomile, eupatorium, will be more proper:

In the opinion of Scudamore, diaphoretic medicines are not much to be relied upon in this disease; they endanger relapses. He prefers a combination of tartar emetic with opium and calomel to all others:

Laudanum, antimonial wine, with peppermint water, or lavender compound make an excellent sudorific: Dr. Rush considers the Seneca snake-root as less exciting than any other medicine of this kind: Seltzer water heated to about 120 Fahrenheit is also highly recommended: The waters of Bath, in England, instead of which Dr. Gardiner recommends Seltzer water mixed with one-third of boiling water, are also highly praised. R. Tartrit. Antimon. gr. ii. Ammon. sub-carbonat. gr. xviii. Aq. Fluvial. oz. vi. M. Take a table spoonful every two hours.

R. Spirit. Minderer. oz. iv. Mistur. Camphor. oz. iv. M. f. capt. oz. ss. q. sec. hor.

Cathartics and diuretics promise more than any other depleting medicines in the ordinary form of gout, more particularly the former.

Scudamore advises a free and complete evacuation of the bowels, by occasional doses of calomel, in union with antimonial powder, and compound extract of coloeynth made into pills with soap.* He speaks in terms of high praise of the following formula; R. Magnes. gr. xv. ad xx. Magnes. Sulphat. ʒi. ad ʒii. Acet. Colchic. ʒi. ad ʒii. Spirit. Lavend. compos. ℥ss. Aq. Fluvial. ℥vi. M. f. haust.; to be repeated occasionally, at intervals of four or six hours, according to the freedom of its operation and the urgency of the symptoms,† and to be continued as long as the urine retains its high specific gravity, and till the tongue and fæces become natural. Sometimes, however, the colchicum has a drastic effect upon the bowels; the dose must then be moderated; in general, however, as an evacuant and a diuretic, it is valuable: It is also easily taken.

Salivation in gout is a dangerous remedy: Mercurials must therefore be used with the greatest caution; they must be always followed up by other purgatives, as rhubarb, senna, and manna.

From the intensity of the pain, anodynes are often necessary. They should, however, not be used till the inflammatory diathesis is nearly subdued, as, if given too early, they occasion the fit to return with increased violence; Previous to administering them, the bowels should be free, and the doses should be at first small: In union with purgatives and diuretics they have a peculiarly excellent effect. The draught of Scudamore above mentioned answers particularly well: It may be given through the day and an anodyne be taken at night; or the opiate may be united with some sudorific, as antimonial wine; increasing the dose of the opium at short intervals till the pain is relieved: Thus we may commence with a grain or a grain and an half or two grains according to the violence of the symptoms, gradually increasing it till the pain subsides.

The preparation of Dr. Battley, called the liquor opii sedativus, is recommended by Scudamore as being less stimulating and more narcotic than any other.

The black drop is valuable; but as it contains nutmeg and saffron it is to be considered as too stimulating in some cases.

The tincture of stramonium, the extract of conium, or of hyosciamus are also useful in many cases; the last mentioned medicine is, however, very variable in its powers.

The tincture of hop, and the inspissated juice of the garden lettuce, in the dose of four or five grains are excellent medicines. Scudamore speaks highly of the stramonium as being useful in allaying the cramps of the muscles.

The aconitum napellus, and the atropa belladonna are also valuable. C.

* Scudamore, p. 101. † Ibid.

With regard to local treatment, experience has fully proved that patience and flannel may safely be trusted to. Leeches and linseed meal poultices are occasionally requisite. Cooling lotions sometimes afford relief; but there are instances in which any application of cold to the affected joint aggravates pain, and increases the tendency to metastasis.

On this subject it is necessary to be a little more particular. Cold water has been advised as a local application; it suits very well those cases where the system is inflammatory, robust, and young, and the disease is in no danger of being translated; It must, however, be applied, as the author states, with very great caution.

Cool air relieved the gout in Dr. Small; It may be particularly useful in the night; The limbs should be kept out of bed and uncovered in inflammatory cases; and when applied, ginger tea, or some stimulant, should be at hand to obviate any danger of metastasis.

Scudamore advises the following prescription as a lotion to the inflamed parts: R. Alcohol. oz. i. Mist. camphorat. oz. iii. M.—apply them to the foot lukewarm by means of linen rags. The ingredients keep up a gentle stimulation, which prevents the retrocession, at the same time that the coldness produced abates the inflammation: It may be applied by means of poultices wetted with it; particularly during the night, when the lotion cannot be conveniently kept on the parts.

Dr. Gardiner recommends the following poultice as valuable: Rye meal, lb. i. Salt, oz. ii. Yest, oz. iv. Wet it with as much warm water as will make it into a dough, and cover the whole foot with it to the thickness of half an inch. The use of all heating substances, of socks, of flannel, of bootikins of oiled silk, flannel, &c. is pernicious; they increase the heat, pain, and inflammation of the parts, are followed by debility of the joints, and they sometimes reproduce the inflammation after it has subsided: The same is true of fomentations, of vapour baths, opiate decoctions, of baths of heated air, sinapisms, blisters, muriatic acid, and burning with moxa; they endanger translation of the disease.

As the reduction of the local symptoms is followed by that of the general fever, local bleeding by leeches followed by the above lotion, first covering the wounds with ointment, will be of the greatest service. Percussion, friction, and swathing the limb with a flannel roller has often been useful.

Mr. Parkinson advises, for the removal of the little swellings produced by the deposition of chalky matter round the joints, the use of a number of leeches, proportionate to the extent of the inflammation and swelling, and afterwards to apply a plaster of diachylon and soap; at the same time avoiding all the exciting causes of gout:* An incision with a lancet often facilitates the cure; a poultice may then be applied, and the chalky matter will be evacuated. When these nodosities are connected with rheumatism, Dr. Bardsley succeeded by topical bleedings, the tepid bath, and a gentle salivation. Sometimes the chalk stones are excessively inconvenient: the skin may then be destroyed by caustic potass, and the sore dressed with mild ointment; the chalk is thus removed.

As soon as the paroxysm has sufficiently abated, the flesh brush and gentle exercise should be used. The gouty become more frequently crippled by indolence and fear of pain than from the effects of the disease.

Riding in a carriage at first, and afterwards walking, will gradually remove the remains of the paroxysm. The mind must be kept perfectly easy; Galvanism and electricity have been useful in removing the stiffness of the limbs, the usual sequel of gout. C.

* See Parkinson on the Gout.

Cases of chronic or irregular gout are to be treated according to the symptoms which may arise; but no attempt should be made, by the liberal use of wine, or by local irritants, to bring on the acute state of the disease. A light diet, and regular moderate exercise, with laxatives, absorbents, and the occasional use of bitters, so as to improve the tone of the system, and regulate the functions of the stomach and bowels, will be requisite in this form of the complaint.* Where an internal organ is attacked,

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* General bleeding is scarcely ever proper. The purgative and diuretic plan so warmly recommended by Scudamore, is that which is most valuable; assisted occasionally by the blue pill at night, and followed by rhubarb in the morning, it will be found to correct the vitiated state of the secretions, and alleviate all the symptoms.

Rhubarb united with the sulphate of quinine, magnesia and quassia, or columbo, in infusion or tincture, or in union with orange peel, will also be found to be valuable.

If the skin be dry, sulphur or gum guiacum, combined with the tonics, will also be useful. In all cases it must be considered whether the habit be nervous, or inflammatory, and the remedies regulated accordingly: If the former, the medicines must be more stimulating; if the latter, the evacuating plan must be more relied upon, and for this purpose, magnesia, sulphur, rhubarb, combined with colchicum will be proper.

Scudamore recommends the compound tincture of benzoin formed into a draught, and given once a day, in union with magnesia, as valuable: It corrects the acidity of the stomach and stimulates the bowels; if it be found too heating, the sulphate of magnesia may be added so as to open the bowels freely: If dyspeptic symptoms prevail, the addition of the sulphate of quinine in minute doses will be proper. If the symptoms be excessively nervous, then it will be necessary to stimulate more; Madeira and sherry wine in the form of whey, with spices; porter, toddy, Warner's cordial, which is prepared in the following manner:—Raisins sliced, lb.ss. Rhubarb, oz. i. Senna, dr. ii. Coriander and fennel seed, of each, dr. i. Cochineal, saffron and liquorice root dr. ss. Infuse them for ten days in a quart of brandy, and strain; add a pint more of brandy to the ingredients, afterwards strain it and mix both ingredients together; four table spoonfuls of this cordial are to be taken every hour mixed with an equal quantity of water, till relief be obtained.

Volatile alkali, volat. spirits of hartshorn, camphor, opium, ginger tea, Virginia snake-root, mace, combined with the more substantial tonics of sulphate of quinine, gentian, will also be found useful.

When spasms affect the system, æther, carbonate of ammonia, oil of amber, may be given; sinapisms should be applied upon the wrists; or volatile liniment, turpentine, or hot brandy by frictions to the limbs, and as soon as the system has recovered, then the more permanent tonics, bark, &c. should be taken.

Where the gout is irregular, and flying through different parts of the system, the Bath water (England) has been praised: The union of water impregnated with carbonic acid with one third of common warm water of about 120° of Fahrenheit, is a good substitute for it: Its effect is to excite the system and bring on a regular fit of the gout in the toes or elsewhere; dissipating the pains by that crisis.

The use of the warm bath of the temperature of 100° and upwards is debilitating: at 82° it has a bracing effect, and often relieves wandering pains and strengthens the system labouring under chronic gout: applied to the limbs, it relieves the pains. In the form of the shower bath, it is valuable, particularly when made of salt water.

In the lameness and stiffness of the limbs, sponging with warm water, fric-

constituting the retrocedent species of gout, the treatment is to be conducted upon the same principles as are applicable in a corresponding idiopathic affection of the part.

When the stomach and bowels are attacked, pressure on the abdominal muscles often relieves the pain and spasm, the most common forms in which they appear.

The cause must first be determined; if from excess of eating or drinking, a vomit of ipecacuanha, with copious draughts of wine whey, followed by a dose of calomel and rhubarb, infusion of senna, lavender compound, mint water, wine whey, brandy toddy, &c., according to the violence of the case. As soon as the bowels are freely opened, large doses of laudanum in combination with aromatics, with camphor, musk, ammonia, in the form of the volatile spirit, or of the carbonate; the camphorated tincture of opium, æther, ammoniated tincture of guiacum, according to the case, will be proper.

Blisters or sinapisms may be applied to the stomach; cloths wrung out of hot brandy, or hot bricks, or bottles of hot water, rolled in cloths; stimulating liniments to the epigastrium, nitric acid in its pure state, on a circumscribed surface, volatile spirits of ammonia, applied to the surface, from their rapidity, will be valuable.

If on examination the limbs should have been the proper seat of the gout from the regular and stated mode of its occurrence, then the above heating applications should be made to the feet: If it has been retrocedent, and has left the limb for many years, these local applications would be of no use.

If its retrocession is the result of suppressed piles, then it will be necessary to apply leeches to the anus; a blister to the old seat of disease, if it arise from a retroceded eruption, will be found useful. If the symptoms be those of a common phlegmasia, produced by cold, then bleeding freely, as in pleurisy, will be necessary.

When apoplexy is the symptom, copious bleeding is the principal remedy, with cold applied to the head and warmth to the feet, and all the assistants indicated in this form of the disease. C.

In the intervals of the paroxysms, the great objects of attention are *diet* and *exercise*. There is high authority for saying, that the gout may be entirely prevented by constant bodily exercise and a low diet; and this, not only where an hereditary predisposition exists, but even where that disposition has already manifested itself by paroxysms of the disease. To ensure, however, the success of these measures, care must be taken to avoid the *exciting* causes formerly enumerated.

The exercise should be moderate, regular, and such as will not induce fatigue; the dress should be comfortable, made of flannel, and adapted to the season; the bowels should be kept open; for this purpose the blue pill in the dose of 4 grs. at night, followed in the morning by rhubarb, will answer, and also improve the digestion:

The vinum chalybeatum, taken in small doses throughout the day, when

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tions on the surface with exercise of the joints, and the application of a roller round the limb, are the only effectual modes of cure.

Liniments and spirituous embrocations, blisters, sinapisms, subdue enlargements of the limbs, attended with œdema, in the happiest manner.

Cramps in the muscles, which are frequent, are best subdued by bandages applied tightly round the limb. Æther, opium, assafœtida, have also a valuable effect in this respect. C.

there is no fever, will also be valuable; Scudamore recommends twenty drops of the ammoniated tincture of iron gradually increased to sixty, in water twice a day: The following formula of the sulphate of quinine is valuable:

R. Sulphat. Quinin. gr. iss. Infus. rosar. ℥x. Spir. myrist. Syrup. aurant. āā ℥i. Acid. sulphuric. dilut. gr. ii. M. f. haust.—repetatur quater die.

Ginger, orange peel, lime water, carbonate of soda or of potash, may be added to serpentaria, columbo, and quassia, according as the stomach requires stimulating, antacid, or other assistants: The cascarilla or the angustura bark will also be found to be excellent. Bitters, however, must not be persisted in for more than two or three weeks, as they lose their virtue and destroy the power of the stomach: The celebrated Portland powder, which consisted of gentian, centaury, and several other bitters, was used with great success for a time, and was at last laid aside from its fatality. The combination of magnesia and rhubarb with bitter medicines assists digestion very much, by removing the acid so common in this disease.

The fixed alkali, both mild and caustic, lime water, aerated alkaline water, are used with the best effect in strengthening the digestion of the gouty, and have been supposed to prevent relapses, and to confirm the convalescence.

Dr. Gardiner gives an account of a singular remedy, for the cure and prevention of the gout, the virtues of which were believed in by the most respectable men of the day, and therefore deserve attention:—a salt herring eaten at bed-time for three nights successively, and no other food or drink to be taken during the night on which the herring was eaten. If the fit was slight, only one herring was necessary; if more violent, two. It points to the use of muriate of soda as a remedy for this disease.

Excessive exercise often brings on the gout: The diet also should not be suddenly changed from animal to vegetable; in old cases it might be fatal; and if the system has been long accustomed to ardent liquors, an entire abstinence from them may be so likewise: It will, therefore, be necessary to be regulated by the case.

Early hours, dry feet, no excesses, regular moderate and continued exercise, are the principal preventives.

It has always been an object of interest to discover some medicine that might obviate the necessity of any restraint upon the diet or regimen of the patient; and at different times remedies have been extolled for the *effectual* prevention of the gout. The principal of these are certain combinations of bitters, and various forms of alkaline medicines; but though they may have succeeded, for a time, in warding off a fit, they are incapable of effecting any such change in the constitution as may altogether prevent the recurrence of the disease.

CHAPTER XIX.

ERYSIPELAS.

Symptoms of the Idiopathic Erysipelas—Its tendency to affect some Internal Organ—Causes of Idiopathic Erysipelas, predisposing and occasional—Question of its Origin from Contagion—Principles of Treatment in the Idiopathic Erysipelas—Of the external Treatment proper in this disease.

SYMPTOMS OF IDIOPATAHIC ERYSIPELAS.

Having already offered an opinion regarding the general pathology of erysipelatous inflammation,—having attempted, that is to say, (page 276) to point out its seat, its relation to phlegmon, and the peculiarities which distinguish it, I have now to detail the symptoms, causes, and principles of treatment of that idiopathic ailment to which the term Erysipelas has been considered more peculiarly to apply. The general character of this disease corresponds perfectly with that form of the affection which is familiar to surgeons, as arising from burns and scalds; and as the frequent consequence of wounds, punctures, operations, compound fractures, and the application of poisons, or acrid matters to the skin. Many of the observations, therefore, which I shall have to offer on the *idiopathic* erysipelas, apply equally to the other forms in which this species of inflammation appears; but it will be more consonant to the general design of this work, to confine my attention to that form of the complaint which falls more exclusively under the cognizance of the physician.*

The idiopathic erysipelas may commence on any part of the skin, but the face and legs are most usually affected. It is usher-

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* "The term erythema, applies more properly to this inflammation when it is entirely local; erysipelas, when the constitution is affected; erysipelas phlegmonodes, when the inflammation involves the cellular membrane, and is generally the result of a scratch, puncture, or other wound."

ed in by febrile symptoms of considerable severity, which continue through the whole course of the disease. The pulse is always frequent, and commonly full and hard. The functions of the brain are much disturbed, and drowsiness, or confusion of the head, amounting in some cases to delirium, accompanies the hot stage. On the second, or, at furthest, on the third morning from the attack of rigor, redness and swelling appear on some part of the skin, very frequently on one side of the nose, spreading rapidly to the rest of the face, or extending over the scalp, neck, and shoulders. There is a distressing sense of heat and tingling in the inflamed surface. The whole face becomes turgid, and upon the second or third day from the appearance of inflammation, the eye-lids are commonly closed. In some instances the disease goes off simply by desquamation of the cuticle, but more usually, after a certain time, blisters arise of different sizes, containing a thin yellowish or transparent serum, which speedily burst, and leave the skin, in that part, of a livid colour. In some places purulent matter forms, and this is very frequently observed to happen in the loose cellular membrane of the eyelids. A disposition to œdematous effusion is not uncommon, and under certain circumstances erysipelas verges to gangrene; but this is rarely observed, except where it occurs as a consequence of severe injuries.

The duration of the disease is liable to considerable variation. In young persons it commonly terminates in six or seven days; but in those more advanced in life, it is often protracted to the twelfth day, or even later. The febrile symptoms do not always cease with the subsidence of external inflammation. In the progress of the disease, and especially towards its latter stages, they assume, in many cases, a well-marked *typhoid* character ; and great debility always characterizes the period of convalescence.

ITS TENDENCY TO AFFECT SOME INTERNAL ORGAN.

The tendency in erysipelas to spread to some internal organ, is a circumstance in the history of the disease of the utmost importance. It is the great source of *danger* in idiopathic erysipelas, and it regulates, in no inconsiderable degree, the treatment. Pleurisy or severe bronchial inflammation have been observed in some cases; but the brain is the organ chiefly liable to be affected. There appears, indeed, to be some peculiar and hitherto unexplained connection between erysipelatous inflammation and disease of the brain. The symptoms are those of phrenitic inflammation; and some of the purest specimens of phrenitis met with in this country are attributable to this cause. In certain cases, the inflammation of the skin abates when the affection of the brain supervenes; in others, the internal and external inflammation proceed together.

CAUSES OF IDIOPATHIC ERYSIPELAS.

The causes of idiopathic erysipelas are not well understood. There is, in some persons, a strong disposition to this kind of inflammation; and in them it is brought on by very trifling causes. Such a disposition appears, in some families, to be hereditary; and it may possibly depend on a peculiar organization of the skin. To the latter circumstance we may, perhaps, refer the greater prevalence of the disease among females. It is certainly a very remarkable fact, that while the erysipelas *sometimes* attacks the robust and plethoric, it is, upon the whole, much more commonly met with among those who have been debilitated, either by previous disease, or long residence in a hot climate, or unwholesome diet, or bad air. It may occur at any age. There is a species of erysipelas which attacks new-born infants, particularly in lying-in-hospitals and workhouses*; but it is chiefly the disease of adult life, and of old age.

CONTAGION.

The discussions regarding the contagiousness of erysipelas, have been as keen as on every other occasion in which the doctrine of contagion is involved. Dr. Wells† has collected several examples of the communication of erysipelas by contagion in private families; and in my own practice this fact has been most strikingly exemplified. In hospitals, it is well ascertained that it frequently spreads by contagion, particularly where there is a defective or *ill-regulated* system of ventilation. Admitting this, I think at the same time it cannot be questioned that erysipelas prevails at some seasons and under certain circumstances of the air, more than at others. What the peculiar conditions of the atmosphere are, which dispose to erysipelatous inflammation, have not been determined. The occasional cause to which *idiopathic* erysipelas is commonly attributed is cold applied when the body is overheated; but intemperance, and exposure to strong heat, have been also considered as giving rise to it. In many cases no exciting cause of any kind can be traced, and it is strictly a *spontaneous* disease.

TREATMENT.

The treatment of erysipelas has proved a fertile theme of controversy. It has been supposed, that the common principles applicable to other inflammatory diseases are inapplicable here;

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* See Dr. Garthshore, in Medical Communications, vol. ii. page 28.

† Transactions of a Society for the Improvement of Med. and Chir. Knowledge, vol. ii. art. 18.

but the supporters of this opinion do not seem to have taken into consideration the variety of causes from which erysipelas originates, and the almost infinitely varied circumstances of situation, age, and constitution, under which it appears. Keeping these in view, it does not appear that any important difference of principle is to be established between the treatment of erysipelatous and of common phlegmonous inflammation.

1. The acute idiopathic erysipelas of the face, occurring out of an hospital, to a stout plethoric young man, is to be treated like any other inflammatory affection. Blood is to be taken from the arm, to the extent of sixteen ounces, and repeated if necessary. It is very seldom, if ever, that more than two bleedings are required. Local depletion by leeches, and still better by free incisions, are often of essential service in erysipelas of the extremities. Purgative medicines are to be given at the same time. The period of convalescence will be shortened by bark and cordials.

2. If erysipelas occurs under circumstances less decisive of the inflammatory nature of the accompanying fever, the chief reliance should be placed on the exhibition of purgatives, especially calomel, jalap, and senna. The saline aperients, too, frequently exhibit a very remarkable influence over this species of inflammation.

3. When erysipelas occurs to aged people, and in debilitated habits; when it originates decidedly from contagion; when it happens in an hospital, to persons suffering under, or recovering from, a tedious illness; when it is attended by a feeble pulse, a brown tongue, and a disposition to gangrene, the system is to be supported (perhaps even from the very first) by bark, aromatics, the volatile alkali, and wine. This draught may be recommended under these circumstances: R. Decoct. cinchon. dr. x. Confect. arom. scr. i. Tinct. cinchonæ compos. dr. i. M. sumt. quaq. quart. hor. With this plan, the occasional exhibition of a purgative may be united with the best effect, and a preference may then be given to castor oil.

4. When phrenitic inflammation occurs as a consequence of erysipelas, it is to be treated by venesection, blisters, and purgatives, not regulated by any consideration of the *cause*, but merely by the state of the pulse, and character of the accompanying fever.

5. Different external applications have been proposed in erysipelas, such as cold lotions, warm and spirituous fomentations, and dry powders. Their influence upon the disease does not appear to be very great; and therefore that one should be selected which best relieves the heat and uneasy sensation which the patient experiences. The following cold spirituous lotion will commonly be found to answer this purpose: R. Liq. ammon. acet. oz. iii. Spir. vin. oz. i. Aq. fontan. oz. xii. M. fiat lotio. It

is certainly preferable to the application of dry powders, which irritate and heat the skin, and in this way often prove prejudicial. In many cases, however, of idiopathic erysipelas, it will be found advisable to refrain altogether from local applications. When there is a tendency to gangrene, stimulating lotions containing camphor prove serviceable, by supporting the tone of the vessels.*

THE HÆMORRHOIDAL FEVER.

Stoerck, in his Annus Medicus, has well described this disease: An obtuse pain in the head, with wandering chills and heats, followed by a rigor, tensive pain in the nape of the neck, and a vague heat creeping over the whole back, succeeded by anxiety and tightness about the hypochondria; ineffectual attempts at vomiting; terrible colicky pains and contracted belly, are its symptoms; Sometimes the belly is swelled without any colicky pain or any effort to

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* The use of leeches is generally reprobated in erysipelas from their tendency to extend the inflammation; Dr. Neill of Philadelphia has, however, frequently tried them and found them useful; as the disease is often fatal by metastasis, particularly when it attacks the brain, in plethoric subjects we should think this practice advisable; though, at the same time, general bleeding, in ordinary cases, had better be resorted to, as former experience is against their use. I have seen erysipelas induced by an incision in the back part of the thigh of an infant, in an attempt to remove a needle which had penetrated it: there can be no doubt, if the system is in an irritable state, that any exciting cause, which acts particularly on the skin, might evolve this disease; the application of leeches, therefore, particularly as general bleeding will answer, we do not think advisable.

With regard to the use of cold saline lotions, they are dangerous, where the skin is broken, as they irritate and extend the inflammation.

Sometimes erysipelas extends itself deeply, and matter is formed below the aponeurosis on the surface of the muscles, destroying the fascia; It extends even to the periosteum: This form attacks sailors particularly, and is best relieved by cutting down to the inflamed surface previous to the formation of matter.

The use of blisters in erysipelas is a practice which originated with Dr. Pfeiffer, of Philadelphia, and has been found useful, after a long experience, by Dr. Physick: They are applied over the part, and effectually arrest it. They have this advantage, that they prevent gangrene. C.

Gangrene often follows erysipelas in hard drinkers.

The state of the stomach often excites erysipelas, especially in persons predisposed hereditarily. It is highly probable that certain changes in the gastric juice produce this effect; and there can be no question that crude, acrid ingesta are followed by a similar consequence. This is more frequently observed in children. The diseases of the liver are intimately connected with erysipelas. A vitiated or a suspended secretion of bile will become the exciting cause in the predisposed. We have in four instances cured this disease by mercury, viewing it as symptomatic of the morbid state of the liver. Emetics are sometimes necessary. P.

The mercurial ointment, contrary to the opinion of physicians generally, with regard to the effects of unctuous substances in this disease, has been found useful by Drs. Dean and Little: It is valuable, but I have ascertained its usefulness to depend upon the lard, and not upon the mercury. Salivation is a frequent result of its application to the surface; on this account the lard alone is preferable. C.

vomit.* The urine is commonly red, and when the pains are excessive it becomes thin and crude: The belly is obstinately bound, and only to be opened by repeated enemas; the sphincter is often so obstinately contracted that a pipe cannot be introduced: Great thirst; a pulse, seldom hard and full, quick, unequal, sometimes dicrotous and intermitting, with restlessness at night, and unquiet dreams, are the symptoms of the first 24 hours:

On the second day the pain of the belly, the anxiety and tension of the hypochondria remit; the pulse is more equal and more free, with moderate thirst; at length a heavy lacerating pain comes on about the loins, with rigors, tenesmus, and retention of urine: The pain in the back of the neck extends itself to the top of the head and temples, and renders motion of the head very difficult and painful: The pain in the sacrum and about the vertebræ of the loins is so great that the patient cannot move; the anus is violently contracted; the nights are excessively restless till the fourth day, when all the symptoms suddenly cease, as also the pain of the nape of the neck and sacrum; Tumours now appear about the anus; These tubercles are sometimes soft and give the sick no trouble; on the fourth day, when they appear, the fever entirely ceases; Sometimes the tubercles are highly inflamed and painful, with tormina, vertigo, stupor in the limbs, and great anxiety, followed by fainting and cold extremities: In two cases mentioned by Stoerck, a copious flow of blood from the anus prevented those tumours from appearing:†

Local applications of a repellent nature are dangerous: repeated venesections, when the pulse is full and hard, on the first and second days, taking care, however, not to weaken the patient too much, otherwise convulsions are the consequence, or an anomalous and chronic state of the disease. Subacid drinks, nitre, oily or saline aperients; a large warm cataplasm to the belly; emollient glysters gently thrown up, are recommended: The colic, vomiting, and tenesmus are relieved by opiates; and on the third and fourth days the vapour of boiling water applied to the anus, lessens the pain, and renders the crisis more easy. If the fever ceases about the third or fourth day, with an appearance of the tumours at the same time, then no other medicines are necessary, avoiding acids, astringents, and acrid aromatics: In these cases the disease soon disappears. If, on the contrary, these tumors become more inflamed with increased pain about the anus, a rise and a fulness of the pulse, emollient cataplasms to the anus, and a frequent detraction of blood are necessary.‡ Injections of nitre, with emollient decoctions, are very effectual: If there is great pain with tenesmus, opium is the best remedy, particularly when the tumors are concealed within the anus:

Leeches should be put upon the anus, in those cases in which vertigo, deep sleep, and convulsions are the result of the recession of the tumours:

Mild emollient decoctions, with fomentations to the pelvis, are proper when there is a suppression of the urine.

All stimulating and strong diuretics must be avoided: Tenesmus; with the most painful efforts to make water, are the result of the use of turpentine, in the hands of Stoerck, from whom the above description is taken: A gangrenous state of the rectum and part of the bladder, and death, are the results of the use of this remedy: An ointment of galls, or white vitriol, may be applied to the anus, if there is no pain in the tumors.§ C.

* Stoerck, second Ann. Med. p. 149. † Ibid. p. 151. ‡ Ibid. § Ibid.

CLASS IV.

HÆMORRHAGIES.

CHAP. I.

GENERAL DOCTRINE OF HÆMORRHAGY.

Character of the Order of Hæmorrhagies—Degree of Importance to be attached to the Doctrine of Hæmorrhagy—Hæmorrhagies general or local—Active or passive—Of Anæmia—Hæmorrhagy connected with Plethora, local Congestion, and weakness of the Coats of Vessels—Causes of Hæmorrhagy, predisposing and occasional—General Principles of Treatment in the Diseases of this Order.

CHARACTER OF THE ORDER.

The diseases comprised in the order of hæmorrhagies are, in every point of view, much less interesting than the inflammations. They are of less frequent occurrence, and seldom met with in an idiopathic form. Indeed, it is only by a stretch of nosological refinement that they can be considered in the light of a distinct order of diseases. The rupture of a blood-vessel is not necessarily connected with a train of other symptoms, and is therefore itself rather an accident or a *symptom*, than a state of disease. While engaged in the investigation of the phlegmasiæ, we were content to refer the phenomena to the presence of *inflammation*. In the class of hæmorrhagies, we must always look to something beyond, and endeavour to determine upon what ulterior cause the rupture of the vessel depends.

IMPORTANCE.

The general doctrine of hæmorrhagy has, nevertheless, always excited attention in the schools of physic; and much learning has unquestionably been shown in investigating the principles which it involves. Dr. Cullen's dissertation on this subject must be considered as a remarkable specimen of acute pathological research; but these discussions, not having the same influence on

practice with some of those which have been already before us, do not require the same attention from the student, and will therefore be only briefly alluded to in this place. Without venturing upon those abstruse theoretical speculations concerning hæmorrhagy, in which some authors have indulged, it may, however, not be altogether uninteresting to notice the principal points which have been thought of importance; and this more particularly, as it will afford an opportunity of exhibiting, in a connected view, several diseases included in this order, the particular consideration of which will be taken up in future parts of the work. Although there may not prove to be many points of analogy among them, it will not be the less useful to notice the principal circumstances in which they differ, and above all, the various, and even opposite states of the system in which they occur.

GENERAL OR LOCAL.

1. Hæmorrhagies may be divided, in the first place, according as they are general or local. A general disposition to hæmorrhagy is not common; but it occurs in scurvy, and in a disease of a very singular kind, known by the name of the *hæmorrhæa petechialis*. The pathology of this affection is but little understood. Different speculations have been thrown out concerning it, which will hereafter come under our notice, when considering the class of chronic constitutional diseases; but for the present, it may be sufficient to state, that it appears to be wholly different from scurvy, that it has some obscure connection with disease within the thorax, and that it is occasionally to be treated by antiphlogistic measures. A general disposition to hæmorrhagy occurs also in many acute diseases, more particularly in different forms of inflammatory and typhoid fever.

Local hæmorrhages may be arranged according as they happen in one or other of the three great cavities or divisions of the body. Hæmorrhagy from the vessels of the head occurs either as *epistaxis* or as *apoplexy*; diseases which have, in some cases, an important pathological connection. Hæmorrhagy from the thorax is denominated *hæmoptysis*. Hæmorrhagy from the abdominal cavity assumes the several forms of *hæmatemesis*, *melæna*, *hæmorrhois*, *hæmaturia*, and *menorrhagia*. Two or more of these forms of local hæmorrhagy are occasionally present at the same time, or occur *vicariously* to each other, illustrating strongly the importance of the general doctrine of hæmorrhagy. They show that hæmorrhages, even the most partial, or apparently accidental (such as that which sometimes follows the extraction of a tooth), are yet connected with a morbid condition of the *whole* arterial system, which is unable to preserve its surface unbroken.

ACTIVE OR PASSIVE.

2. From the situation assigned to hæmorrhagic diseases in most systems of nosology, symptoms of *fever* might be expected; but one of the most important considerations in the general doctrine of hæmorrhagy, is the frequency of its occurrence without any evidence of febrile excitement existing in the system. In some cases, hæmorrhagy is preceded by rigors; and during the flow of blood the pulse is frequent, full, or even hard, the skin is hot, and there is thirst and restlessness. At other times, hæmorrhagy exists with a state of general constitutional debility, and arises from causes that obviously weaken the tone of the system; as is well exemplified in some of the cases of menorrhagia. These facts have long been known; and they have given rise to one of the oldest pathological distinctions among hæmorrhagies; *viz.* into the *active* and the *passive.*

ANÆMIA.

3. All hæmorrhagies when long continued are apt to induce a very alarming state of constitutional weakness. The blood degenerates into a state of morbid tenuity. It is rather bloody serum than blood. Even in the heart itself but little crassamentum will be found. This condition of the fluids is generally known by the name of *anæmia*, and it perhaps sometimes exists independent of hæmorrhagy. Its symptoms are a pale and bloodless countenance, great weakness, disposition to syncope, loss of appetite, indigestion, swelled legs, and a pulse weak, tremulous, and intermitting. It is most commonly witnessed in women suffering under cancer uteri, and its attendant hæmorrhagy.

4. In estimating the circumstances which may lead to the accidental rupture of a vessel in an internal part, there are three which chiefly merit attention. The first of these is the quantity of blood in the body; the second is the force of the heart's action (these two constituting the impetus, or *momentum* of the blood); and the third is the strength of the coats of the containing vessel, depending principally on the *original* constitution or structure of the body. By one or other of these considerations we may explain the manner in which different circumstances act as the predisposing or occasional causes of hæmorrhagy, and the *modus operandi* of the remedies which are resorted to for its relief or removal.

FROM PLETHORA.

1. Plethora, or præternatural fulness of the blood-vessels, is a state of the body, the reality of which is established by am-

ple as well as the most simple evidence. It is the common consequence of full living, and of a sedentary life; and it proves a frequent source of disease. A man too full of blood becomes heavy and languid. A state of over-distension in vessels gives a disposition to increased action in them; hence it is, that whatever leads to *general plethora* is so frequently found to be a predisposing cause of inflammation, and of hæmorrhage, and even of fever. It will be remembered, however, that a state of plethora is by no means essential to hæmorrhage, which is compatible even with a state of morbid tenuity of the blood.

FROM LOCAL CONGESTION.

2. The mere force of the heart's action has something to do with the occurrence of hæmorrhagy; for heat, and violent exercise of the whole body, as in running, are among the most frequent of its exciting causes; and they can only act by hurrying the circulation. The idea entertained by old pathologists, of a *spurious* plethora, has been long abandoned. But the more necessary circumstance to be kept in view, is the connection of hæmorrhagy with the state of partially increased action of vessels, or irregular determination of blood; or, as it is now more commonly called, *local congestion.* This has always been recognized as a principle in pathology of the highest importance; and it is undoubtedly the most generally applicable of any which have been established in the whole extent of pathological science. We have seen it influencing the phenomena and treatment of every form of idiopathic fever. It is the very basis of all reasoning on the subject of inflammatory action; and we shall subsequently find it to extend to many of the most important chronic diseases of the body. In what manner this local determination of blood is brought about,—how it is that the heart, which appears calculated to supply blood equally to all parts of the body, should distribute it unequally, are questions which the inquiries of physiologists have not, hitherto, enabled us to decide. The fact itself, however is well ascertained; and it strongly illustrates the great principle, which, though generally professed, has yet been too frequently lost sight of—that the doctrines of hydraulics are but distantly applicable to those of the circulation of the blood*.

With this doctrine of local congestion, that of hæmorrhagy is closely connected, as will hereafter be illustrated in several ways; by the phenomena, for instance, of epistaxis and apoplexy; by the effect of posture in favouring different forms of hæmorrhagy; and by the fact, that exercise of the lungs in singing, or loud or

* See a very ingenious Essay by Mr. Charles Bell, entitled, "On the Forces which circulate the Blood, being an Examination of the Difference between the Motions of Fluids in living and dead Vessels." London, 1819.

long speaking, will occasion a fit of hæmoptysis. We have already seen, that the state of hæmorrhagy is sometimes dependent on that of *inflammation*, as in the instance of dysentery and pneumonia; and there is reason to believe, that, in some other cases, the same pathological connection may subsist, although it be less apparent. The general analogy between these states of disease may be further traced in the similarity of their predisposing and exciting causes, in the effects of the *juvantia* and *lædentia*, and in the appearance of the blood drawn. In almost all cases of hæmorrhagy attended with symptoms of constitutional excitement,—that is to say, in all stages of active hæmorrhagy, the blood drawn will appear buffy and cupped. This phenomenon was considered by Dr. Cullen of such frequent occurrence as to merit notice in his definition of the order.

By some pathologists it has been conjectured, that the evolution of organs at different periods of life is one cause of those partial congestions of blood which take place in the body, and which, by over-distending a particular set of vessels, dispose them to rupture. It has generally been observed, that epistaxis is the hæmorrhagy of childhood; hæmoptysis, of the age of puberty; and that the abdominal hæmorrhagies occur in the more advanced periods of life. It is possible, that *many* circumstances contribute to this peculiarity in the phenomena of the hæmorrhagies; but the theory which ascribes it to partial plethora from the evolution of organs has probably some foundation in nature.

FROM WEAKNESS OF THE COATS OF THE VESSELS.

3. The third general condition of the body which was noticed as tending to hæmorrhagy, is a weakened state of the coats of the blood-vessels. This usually depends on original formation, and is not unfrequently hereditary. In some constitutions the arterial system appears to be peculiarly weak and lax; and it has been conjectured, that this often occurs in persons of a scrofulous diathesis. In these habits it is reasonable to suppose, that the blood-vessels will give way from the application of causes which would have no such effect in a different habit of body. An idea is entertained by some pathologists, that mere *laxity* of the coats of vessels, independent of actual *rupture*, is sufficient to cause the effusion of blood. That the colouring particles of the blood may *exude* along with the secretions of the part in certain relaxed conditions of a membrane is probable; but it is questionable how far this corresponds with genuine hæmorrhagy.

CAUSES.

Hæmorrhagy may take place both from veins and from arteries; and frequent attempts have been made to explain what cir-

cumstances determine the one or the other of these events. It is generally admitted that arterial hæmorrhage is most frequent in early life, and venous hæmorrhage at an advanced age. This circumstance is believed to depend upon certain differences in the *relative density* of the coats of arteries and veins at different periods of life. The portion of the *venous* system most liable to hæmorrhagy is the vena portæ. This vessel appears to differ in structure, as it certainly does in distribution, and probably in function, from the other veins of the body, and to partake closely of the nature of an artery. We presume, that in hæmatemesis, and in certain cases of abdominal hæmorrhage, the rupture takes place in some of the branches of the vena portæ. Whenever there is a disposition to hæmorrhagy, either venous or arterial, it is reasonable to expect that the vessels will give way in that part where they are least supported by integuments, or surrounding muscular or ligamentous substance. Hence we may perceive, why hæmorrhages are so much more frequent from the lungs, and the vessels of the Schneiderian membrane, than from any other part of the body.

TREATMENT.

4. The general principles of treatment in hæmorrhagy must be varied to meet the varying circumstances under which it occurs. A very erroneous idea once prevailed in the schools, that hæmorrhagies were salutary efforts of nature, and that they were to be encouraged rather than checked. This originated, in part, from the temporary relief which the patient experiences from the discharge of blood; but the reasoning by which the doctrine is supported is vague, and the practice to which it leads, at least in the great majority of cases, dangerous. We may not always have it in our power to check hæmorrhagy, but we should at least attempt it.

The principal objects of treatment in cases of internal hæmorrhagy are four;—to diminish plethora, where it can be rendered probable that it exists; to lessen the *vis a tergo*, or the force of the heart's action; to induce the formation of a coagulum about the ends of the ruptured vessel; and lastly, to bring on contraction of the muscular fibres of the vessel, and of the parts in its vicinity. Upon one or other of these principles may be explained the mode of action of each of those means, which have been found useful in the treatment of internal hæmorrhagy. They are, blood-letting, digitalis, purgatives, cold, the exhibition of astringents (such as alum, the superacetate of lead, and the mineral acids); and lastly, opiates and tonics. Some degree of doubt prevails as to the propriety of administering opium in a state of hæmorrhagy, and certainly it is not adapted to every form of the disease. It is chiefly indicated where the hæmorrhagy is of the

passive kind; and where it appears to come on from a *habit*, which the system has acquired, of relieving itself at particular times. This disposition in hæmorrhagy arising from internal causes, to recur after certain intervals, and often at stated periods, is a very curious, but, at the same time, one of the most general and best established of the principles which regulate its phenomena.

The application of this principle to the treatment of hæmorrhagy, and the adaptation of the different means which have been enumerated, to the several circumstances under which hæmorrhagy occurs, will become objects of inquiry in future chapters.*

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* Epistaxis, and hæmoptysis, being the only species of hæmorrhagy attended, in common cases, with *pyrexia*, and the consideration of which does not involve that of chronic local disease, can alone be considered with propriety in this part of the work.

CHAPTER II.

HÆMORRHAGY FROM THE NOSE.

Symptoms of Epistaxis—Periods of Life at which it occurs —Exciting Causes—Epistaxis symptomatic of other Diseases—Treatment of Epistaxis, internal and external.

SYMPTOMS OF EPISTAXIS.

The vessels that ramify upon the Schneiderian membrane are very numerous, and, from their forming a net work, which is covered only by thin and delicate integuments, easily ruptured. The flow of blood from them, when it does not happen from accidental causes, is usually preceded by symptoms marking a determination to the head, such as throbbing of the carotid and temporal arteries, head-ache, flushing of the cheeks, giddiness, and a sense of weight, or fulness, in the nose; or by such as indicate a general state of increased action throughout the whole arterial system, as a quickened pulse, restlessness, disturbed dreams, thirst, diminished secretion of urine, and costiveness. The blood commonly flows from one nostril only; but often in quantity that may reasonably occasion considerable anxiety. Nor is it the occurrence of a single fit of hæmorrhagy which is alone to be considered; in almost all cases, it recurs for several weeks at certain intervals, and often tends very materially to weaken the body.

PERIODS OF LIFE.

Epistaxis (for so this hæmorrhagy is called) happens equally to both sexes; and it may occur at all periods of life, but is chiefly observed to prevail among young persons advancing to puberty. In this case it may be considered as one of the evidences of that irregular distribution of blood, which characterizes the period of puberty, and which so strikingly manifests itself in the irritable constitution of the female. This principle in pathology will hereafter form the ground-work of our reasoning concerning the symptoms of *amenorrhœa*. The frequency of epistaxis at this period of life is very remarkable; and there can be no question, that if it be not excessive, it is productive of no particular inconvenience;—in some constitutions it may even serve

to diminish plethora. If it recurs, however, with great frequency, and is very copious, it becomes an object of serious attention. It is then commonly said to mark a state of arterial plethora. This is doubtful. It much more obviously points out a state of weakness in the original structure of the vessels of the body. It was an observation of Hippocrates, that persons subject while young to severe and obstinate bleedings at the nose, easily fall into dangerous diseases of the chest; more especially peripneumonies, hæmoptysis, and consumption.

Hæmorrhage from the nose occasionally occurs in the middle periods of life; but it becomes common towards the decline of life, when it probably depends upon the same causes which lead to apoplexy and palsy.

It may often be regarded as a salutary effort of nature to throw off these diseases. Great care should be taken that the evacuation be not critical; when the suppression of it might be serious: Phrensy, inflammatory fever, apoplexy, vertigo, and head-ache, are often materially benefitted by a free flow of blood from the nose; it should, therefore, be suffered to continue as long as the patient is not weakened by it; the same remark applies to this evacuation, when it occurs in the plethoric and robust. If, however, it produces great weakness, it must be stopped immediately. C.

EXCITING CAUSES.

Among the exciting causes of epistaxis, pathologists have enumerated both heat and cold, and in different ways both may contribute to the occurrence of the hæmorrhagy. It frequently comes on without the slightest apparent cause, but is obviously attributable in other cases to exertions of the body, such as running, coughing, or blowing the nose. Particular postures favour it, as stooping, or lying with the head low. On this account, persons liable to epistaxis are frequently attacked by it on first waking. Epistaxis is occasionally to be traced to the suppression of some usual evacuation, especially in young women to the suppression of the menses. Under such circumstances, it has sometimes afforded relief to other symptoms.

SYMPTOMATIC.

Hæmorrhagy from the nose is a symptom of different diseases; and as such, not less deserving of attention than when it occurs in an idiopathic form. It is met with in some of the severest cases of inflammatory fever, in low typhus, in the small-pox, and in several chronic diseases, as hooping-cough, and scurvy. After what was stated in the last chapter, it will be obvious, that in each of these cases, the occurrence of the hæmorrhagy is attributable to different causes. In conjunction with other symptoms, epistaxis always affords an important index of the *state* of

the system, and proves an useful guide in practice. It is a very old and just remark, that hæmorrhagy from the nose accompanies some forms of abdominal disease, particularly obstructions of the spleen. The obscurity in which the functions of that organ are involved, would alone prove an insurmountable obstacle to any attempt at an explanation of the phenomenon.

TREATMENT.

Idiopathic epistaxis, when it occurs in *young* persons, and not in an excessive quantity, is scarcely an object of medical treatment. A light diet with an occasional dose of salts, however, will certainly be advisable. In severer cases, cold is to be applied to the head and back. Purging, regular exercise, early rising, and a diet strictly antiphlogistic, are then to be recommended. The tincture of digitalis, in union with the sulphuric acid and infusion of roses, will also be found very useful.

A hog's gut tied at one end, and introduced into the nose, and filled with vinegar, has been used to make pressure on the bleeding orifice, with success.*

The sugar of lead, sulphate of zinc, nitre, and alum, are often given internally, and sometimes with effect: Blisters to the back of the neck are also useful. The bowels should be kept open by saline medicines, and cooling drinks should be given to assist their operation.

Dr. Miner praises capsicum, as a most valuable anti-hæmorrhagic medicine in almost every case of sudden and alarming hæmorrhagy, except it be from wounds: He gives it in the dose of from 3 to 5 grains every ten minutes, after the system is sufficiently reduced. C.

When epistaxis occurs in the middle, or more advanced periods of life, it is often excessive, and is associated with plethora, and high vascular excitement. It then frequently becomes necessary to use very active means. Blood must be taken from the arm even till the patient faints. The nostrils are to be plugged up, both anteriorly and posteriorly, by dossils of lint dipped in an astringent solution, such as the liquor aluminis compositus.

"The compound tincture of benzoin may also be used, and the lint may be dusted over with equal parts of alum and sulphate of zinc; or powdered charcoal moistened with water, and applied by tents inserted into the nose: A solution of the sulphate of copper; of the sulphate of iron; of common salt; of muriate of ammonia, may be thrown up the nose by a syringe. The patient should be placed in an erect posture; drink freely of cold liquors; placed in a cold room; kept quiet, and put on a low diet," &c.

The bowels are to be kept freely open for a considerable time, by the following mixture, and a very spare vegetable diet rigidly enforced: ℞. Infus. senn. comp. oz. v. Potass. tartrat. oz. i. Tinct. Jalap. Tinct. Senn. āā oz. ss. Syrup. rhamn. dr. iii. Take oz. ii. every four hours.

* Thomas, p. 299.

CHAPTER III.

HÆMORRHAGY FROM THE LUNGS.

Circumstances under which Hæmoptysis chiefly occurs—Predisposing Causes—Exciting Causes—Prognosis—Connection of Hæmoptysis with Tubercular Phthisis—Principles of Treatment.

CIRCUMSTANCES UNDER WHICH IT OCCURS.

The discharge of blood from the lungs is usually accompanied by symptoms denoting determination to that organ, amounting in some cases, perhaps, to actual inflammation. There is a sense of fulness, heat, weight, tightness, or oppression about the chest, increased on full inspiration, some uneasiness in breathing, and a short tickling cough. Symptoms of fever are also present, such as shiverings, pains in the back and lions, a flushed countenance, lassitude, costiveness, a dry skin, and a hard pulse; but these are subject to great variety. I have seen the pulse, for instance, feeble and indistinct, so as to be hardly perceptible. The spitting up of blood is commonly preceded by a degree of irritation felt about the larynx, and a saltish taste perceived in the mouth. The quantity of blood brought up is very various. A slight tinge of the expectoration is sufficient to characterize the disease, as it marks the hæmorrhagic tendency, and may quickly be followed by a gush of blood. Again, it is sometimes so profuse as to occasion alarm for the immediate safety of the patient. It commonly recurs for several days together, and is often renewed upon very slight exertions. The blood is of a florid colour and frothy.

To distinguish this disease from hæmatemesis, or vomiting of blood, is often more difficult than might be anticipated, owing to the occurrence of vomiting during the discharge of blood from the lungs; but in ordinary cases, an attention to the preceding symptoms, to the appearance of the blood, and to the general habit of body, will be sufficient to establish the diagnosis.

PREDISPOSING CAUSES.

1. The most important considerations connected with hæmoptysis are those which relate to its predisposing and exciting causes; for by these we are to form our judgment of the probable termination of the disease, and be in a great measure guided in our method of treatment. Of the former, however, one only can be considered as under our control, and that one, the least frequent of the whole:—I mean, *plethora* of the system generally. The simple rupture of a blood-vessel in the lungs, from fulness of blood and increased action, either within the chest, or throughout the body, independent of any peculiarity of structure, has sometimes been observed, but it is unquestionably a rare occurrence; and this must surely be a matter of surprise, when we reflect how numerous and how large the blood-vessels of the lungs are, and by what a very delicate membrane they are covered and supported. Under such circumstances, however, hæmorrhagy may occur from the lungs, as from the vessels of the Schneiderian membrane. By rest and low diet, the ruptured vessel would soon heal, without any further bad consequence.

2. The second predisposing cause of hæmoptysis, is the *scrofulous diathesis*, or that habit which is marked, among other peculiarities, by a general delicacy of structure throughout the body—light and thin hair, a smooth and soft skin, a lax muscular fibre and slender form. Of this delicacy of structure the blood-vessels appear to partake; and consequently a disposition to *hæmorrhagy* becomes also a character of scrofula. That it should particularly appear in the lungs, might be conjectured from what has just been stated; but a further disposition in such a habit of body to this form of hæmorrhagy is given by *tubercle*, the connection of which with scrofula has been already noticed (page 427). It is necessary however to add, that weakness of the vessels of the lungs, disposing them to rupture, is often met with independent of scrofula. Hence it happens that some persons spit blood from any cause that weakens the body generally.

3. The third circumstance giving a predisposition to hæmoptysis is *period of life*. It rarely happens to children under the age of twelve years, and is not frequent after that of five-and-thirty. It chiefly prevails between the ages of fifteen and twenty-five. Pathologists have attempted in several ways to explain this circumstance. It has been said to depend upon the growth of the thorax continuing, after other parts of the body have been fully evolved, manifested by the increased width which the chest acquires at that period of life. Dr. Cullen has imputed it, in part at least, to a want of due balance between the aortic and pulmonary systems, which must chiefly be felt at that age,

when the former has arrived at its utmost extension and resistance. To whatever cause it is to be ascribed, there can be no question as to the general correctness of the position, that this particular period of life gives a remarkable predisposition to hæmorrhagy from the lungs.

4. The fourth predisposing cause of hæmoptysis is *malformation of the chest*, which obviously acts by preventing the due expansion of the lungs. Persons who have suffered in early life from rickets, to such an extent as to affect the spine or ribs; are very liable at another age to hæmoptysis. The scrofulous habit of body is characterized by prominent shoulders, and a narrow chest; and this is one, among other reasons, why the scrofulous diathesis is so frequently accompanied by a tendency to hæmoptysis, upon all occasions which impel the blood with any degree of increased impetus upon the vessels of the lungs,—in other words, upon the application of the *exciting* causes. These are very numerous, some acting more immediately upon the lungs, and some indirectly through the medium of the general system.

EXCITING CAUSES.

Among the exciting causes of hæmoptysis, which act directly upon the weak blood-vessels, the most important are external injuries; violent exercise of the whole body, as in running, or wrestling; of the lungs in particular, as in loud or long speaking, playing on wind instruments, or glass blowing. Those which act indirectly are full living, and particularly the free use of wine; alternations of atmospheric temperature, and, as some allege, of atmospheric pressure; sudden exposure to cold after being overheated; the suppression of usual evacuations; and apparently in some cases the amputation of a limb.

PROGNOSIS.

The prognosis in hæmoptysis is to be regulated by the following considerations. As far as it is idiopathic, and as the mere effusion of blood is concerned, it is certainly favourable. Dr. Heberden, in the course of a long life, saw only one case of death from the excessive loss of blood. In a large proportion of cases however, hæmorrhagy from the lungs is but a symptomatic affection; and the prognosis, therefore, merges in that of *consumption*. The connection that subsists between these two diseases, hæmoptysis and tubercular phthisis, is in a practical point of view of the highest importance. The subject was formerly noticed when treating of consumption, but I have hitherto delayed mention of it, because it was desirable that the student should view pulmonary hæmorrhage somewhat abstractedly in the first in-

stance, and afterwards as forming one in that series of symptoms which constitutes phthisis pulmonalis.

TREATMENT.

As the prognosis in hæmoptysis is intimately connected with that of consumption, so also is the prevention and treatment of the disease. All that I shall now attempt, therefore, is to point out, in a few words, the method of treatment which is to be recommended with the view of checking the *immediate* effusion of blood.

While the blood is actually flowing, little can be done further than to admit cool air, and to avoid every kind of exertion, more particularly speaking, Ice, or ice-cold acidulated drinks, may be freely administered, and the diluted sulphuric acid, in the dose of thirty or forty drops, every six hours. In some few cases, it becomes necessary to open a vein in the arm while the patient is expectorating blood. This however may generally be deferred for a few hours, when feverish symptoms supervene. The pulse becomes full and hard, the skin hot, and there is a sense of oppression about the chest. The blood will generally be found buffy. A saline purgative is then to be given, and cold acidulated drinks persevered in. The necessity of a second bleeding will be judged of by the state of the pulse, the habit of body, and the appearance of the blood first drawn; but, unless the symptoms are urgent, it will commonly be advisable to trust, from this period, to nitre, sulphuric acid in the infusion of roses, and tincture of digitalis: R. Infusi ros. comp. oz. ss. Acid. sulphur. dilut. gtt. xv. Syrup. dr. i. M. f. haust. quart. hor. repetend. If the patient be threatened with a return of the hæmorrhage, ten or twelve leeches should be applied to the chest; and if necessary, recourse had to alum and the superacetate of lead:—R. Alum. scr. i. Conserv. ros. dr. i. M. ft. bol. quaq. sext. hor. sumend. —R. Plumb. superacetat. gr. ii. Extract. hyosciam. gr. iii. M. f. pillul. mane et nocte sumend.* The bowels are to be kept open by saline purgatives. A light vegetable diet is to be directed, and by degrees some gentle exercise should be taken. Where a fixed pain is complained of, and the smallness of the pulse forbids bleeding, a blister may be applied.

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* The kino, sulphate of zinc, catechu, or sulphate of copper, with small doses of opium, may also be given: R. Kino, et catechu, ā gr. x. Opii. gr. ¼. M. f. pulv. repetat. q. secund. hor.

Or, R. Sulphat. cup. gr. ½. Opii. gr. ⅙. M. f. pillul. quaq. sec. hor. repetend.

Or, R. Sulphat. zinc. gr. i. Catechu. gr. xii. Opii, gr. ss. M. f. pulv. q. secund. hor. repetend.

Or, R. Alum. gr. x. Sulphat. Zinci, gr. ss. Opii pulv. gr. ss. M. f. pulv quaq. sec. hor. repetend.

Or, R. Sacchar. saturn. gr. ii. Opii, gr. ¼. M. f. pulv. q. sec. hor. capiend.

Where the hæmoptysis is attended with a spasmodic and irritable state of the system, with cold extremities, anxiety, restlessness, paleness of the face, alternately with sudden flushes, pale urine, small and contracted pulse, opium is not only a safe, but an indispensable remedy.* C.

With the view of relieving the cough, a linctus of oxymel, or the following mucilaginous mixture, containing a proportion of the syrup of poppies, may be taken frequently during the day: R. Extract. hyosciam. gr. iv. Hydrargyr. submur. gr. i. f. pill. omni nocte sumend.

Occasionally, a different plan of treatment should be adopted. When the spitting of blood takes place in warm and relaxing weather, when the pulse is weak, and the ordinary evidences of febrile excitement wanting, we may reasonably presume that the rupture of the blood-vessel has been owing to relaxation and debility. Under such circumstances, leeches and active aperients are carefully to be avoided. The patient is to be directed to take one or two glasses of port-wine daily, and every six hours a draught composed of ten drachms of decoction of bark, with twenty minims of elixir of vitriol.†

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* See Richter, Specielle Therapie, vol. iii. s. 297.

† In hemoptysis, Dr. Miner recommends from three to five grains of capsicum every ten minutes, in powder or pill, as a remedy of the greatest possible efficacy: He finds it valuable in almost every alarming case of loss of blood: Where the pulse is active, venesection should precede its use: it acts then like a charm.

The use of nitre in large doses has been lately recommended. Dr. Rush advises a tea spoonful of common salt: It may be taken every half hour till it produces an abatement of the symptoms. Among the opiates which are advised, the hyosciamus is mentioned favourably.

To prevent a return, the exciting causes are to be avoided, and the body kept low by the antiphlogistic regimen, a laxative diet, and cooling purgatives: all active exercise must be avoided: easy travelling, riding, and if there be evidence of continued disease in the chest, a blister had better be kept open.

END OF THE FIRST VOLUME.

Directions to the Binder.

VOL. I.

The binder will observe that signatures 25, 26, 27, 28, 29, 30, 31, 32, and 33, (from page 193 to page 264,) have VOL. II. affixed to them by mistake.