

ARTICLE VIII.

A

DISSERTATION

ON

THE PROXIMATE CAUSE OF FEVER.

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Read at the annual meeting, June 6, 1820.

IN selecting a subject for the present discourse, I have been more influenced by attachment to certain early opinions, than by confidence of ability to defend them. Such is the diversity of symptoms, and so varied are the conditions of the system, under which fever is acknowledged to exist, that no definition has yet been settled to which some objection might not be offered. Still less stable has been the fate of general views of pathology and therapeutics, which, in rapid succession, have been offered by learned and ingenious men; and which seem to have given splen-

dour to medicine at different periods of its history, but, nevertheless, have gone down with the influence of their authors. From the wreck of each system, however, fragments have been gathered, and preserved, as items of knowledge, or as specimens of progressive improvement.

By presenting a particular view of the immediate cause of fever, it is not meant to complain of the labours of others, nor to express disrelish of the fruits of industry served up by them; but it is hoped, by discoursing on a subject, which appears the most neglected, to add something to the common stock. The sentiments which will be offered are not deemed so new, nor are the inferences so wide of authority as to occasion much concern for their reception; indeed, it may satisfy my purpose, if others may be stimulated to investigate the subject, who shall be more able, or more fortunate. For it must be useful to limit conjecture, although we fail of full certainty; and there must be advantage in discriminating the cause and nature of a disease, although, in practice, medicine be continually applied according to observation of its remedial influence.

In my first practice, men of experience were not always at hand, to be consulted on different occasions. Solicitude was often felt, lest mischief might occur from my inexperience; of course, a strong interest to watch the first appearances of disease, that by observation of its

nature, and by the application of remedies in the incipient stage, ~~extremities~~, demanding a more serious and difficult treatment, might be avoided. The advantage of diligence in these things was soon perceptible; and the opinion, that general disease, or fever, was of secondary character, gradually became confirmed; for preliminary symptoms were as constantly noticed in cases of fever, where local irritation might be very obscurely indicated, as in those instances, where a local affection was evidently the cause.

In the term *typhus* it is intended to include all those varieties of fever, occurring in cold climates and in cold seasons, which usually have been distinguished by the epithet *typhoid*; "such as have been described under the name of jail, ship, slow, nervous, or petechial fever;" on the contrary, by *continued fever*, it is meant to designate that fever which appears to be peculiar to the hot climates, and hot seasons. Other terms will be used in the common acceptation.

Very few diseases are to be found, in which pyrexial symptoms do not sometimes occur. When these are noticed to depend on inflammation existing in any particular part, and to have both origin and termination connected with the local disease, the fever is said to be symptomatic. Idiopathic fever, on the contrary, has been supposed to take place independently of any topical inflammation; to arise from an impression gene-

rally made ; and from which, long after its remote cause has ceased to be applied, upon the occurrence of various exciting causes, a paroxysm, or group of symptoms, derives its origin, and is accounted the beginning of fever.

Though some definite result, proceeding from the first morbid impression, may be generally believed to take place, and to constitute the immediate cause of the paroxysm, yet the obscurity in which the fact is involved, has allowed much scope for speculation, and disagreement. It has appeared to me unfortunate, that negative, rather than positive symptoms, should be preferred in discriminating the disease ; that, in the definition of fever, more importance should be attached to the circumstance of its cause not being clearly evident, than to the affection of parts principally suffering in the attack. If remote causes effect injury to the body, there must be circumstances of complaint which may indicate what that injury is ; and if exciting causes are found necessary to the development of fever, the operation of these may be traced ; and whatever period of time may elapse before its immediate cause shall be fully understood, the particular injuries sustained by the body from the operation of known causes are data, by which it must be demonstrated. Indeed, it would already appear within our reach, to unravel the mystery, and disclose the secret

“spring, which suddenly unfolds the febrile operations.”

Among the symptoms indicating the approach of fever, perhaps none are more constantly observed than a dull headach, which may be more or less transient, or remitting; an unusual sense of weight in the limbs, and uneasy or painful sensations about the back; all of which may be referred to a diseased state of the muscular system. There are other signs also, as unnatural sensibility of the flesh, manifestd by soreness upon being handled; soreness of the eyes; catarrhal appearances, but which are attended by a more clouded aspect than belongs to a cold; occasional diminution of appetite, and nausea; a flushed, or dejected countenance; reluctance to labour; dulness of thought, &c. These do certainly give the warning, though it will happen, that sharpness of appetite, exhilaration of spirits, and activity shall, conspicuously, be tokens of approaching disease. Some of the antecedent symptoms may continue along with the fever; even in delirium, and in stupor, they may remain perceptible; but there is a peculiar condition of the stomach usually designated by the terms *oppression about the precordia, anxiety, &c.* which is first noticed at the commencement of a paroxysm, and is the last symptom, which disappears, as it terminates. It has been equally well observed, that irritating substances taken into the stomach,

as solid food, aggravate the fever during its continuance, and are very apt to cause a relapse after a well marked crisis had appeared. Thus we may conclude that there is excess of sensibility in that organ, suited to the display of fever. And according to Bichat, and other pathologists, accumulated sensibility in a part is to be considered an inflammatory state, in which there is increased determination of blood to the part, and excess of vascular action. It is a state, too, productive of many sympathetic affections in other parts of the system. The opinions of most writers concur in this, that the stomach is largely concerned in producing, and in maintaining the phenomena of fever. Physicians, in practice, have a settled habit of looking to the tongue as an index to the state of stomach; and, in judging of the nature and state of disease, their opinion is very greatly influenced by its appearances. Dissection of subjects, dying in the acute stage of continued fever, which has been said to consist of a single paroxysm, has demonstrated engorgement of the veins, and inflammatory appearances of the villous coat of the stomach. We may of course conclude, not only that a morbid state of stomach is inseparably connected with fever, but that this organ is irritated in a manner that readily produces inflammation, if, in the first instance, it cannot be said to be inflamed. Still, it may be conceived that this state of the stomach

is not the proximate cause, but an essential part of the operation of fever. If it be necessary to the existence of fever, yet it may depend on previous derangement in other parts of the system, which sometimes may, and sometimes may not be in force adapted to this particular consequence. Such previous derangement, then, may be considered the *sine qua non*, or the immediate cause of fever. This opinion is now advocated. But aware of many difficulties in the way, I proceed in the investigation with diffidence.

The effluvia proceeding from marshes, stagnant water, and from other sources, are still regarded as febrific materials, but their essence does not yet appear to be understood. The only way to comprehend the nature of fever, depending on such a cause, must then be, to search out the injury sustained by the body previous to the accession. It is important to distinguish the character of derangement produced in particular parts, and to regard the more fugitive symptoms that first appear—the cause of which probably forms a foundation for the disease.

The excess of heat and severity of cold, when sustained beyond the period to which the powers of the system are able to hold out in resistance, appear to operate as remote causes of fever; and sudden changes of temperature have undoubted influence as exciting causes. The agency of winds, or currents of air striking on the

body, generally, or partially, together with the power of moisture in the atmosphere, may simply have relation to temperature by facilitating its action.

Among people equally exposed to the action of noxious causes at the same time and place, symptomatic fever, as well as idiopathic, may be noticed to distinguish the character of disease in different individuals. Cold, moisture in the atmosphere and other reputed causes of idiopathic fever may produce signs of derangement in the system, which, after various space of time, may result in fever, or may wholly subside without it. The same uncertainty and consequence may be observed with respect to symptoms, which precede the establishment of local inflammation necessary to symptomatic fever. Consequently, by observing principles which operate in producing the cause of symptomatic fever, means may be obtained for penetrating the more secret enclosure of idiopathic fever.

In catarrhal disease, we often notice headach, flushes, chills, uneasiness throughout the body, and evening exacerbations. These symptoms are also common to fever. And, before inflammation in the pituitary membrane, there are preliminary symptoms which appear to arise from the action of cold directly; such as defect of perspiration, unusual sensibility to a current of air, or chills produced by slight diminution of temperature.

If remedies be not applied seasonably, and especially, if new exposures are heedlessly encountered, local inflammation is soon established. When it fixes upon the pituitary membrane of the nose, or even extends to the palate and throat, but without concentrating to a definite point, the consequence is disease simply called a cold; but when the inflammation, first diffused upon the membrane of the nose and throat, concentrates at some point about the fauces or larynx, a relative variety of cynanche is produced. In epidemic catarrh, or influenza, inflammation appears to pervade the whole pituitary membrane, as in extent it lines the bronchial vessels and cells, the throat, the nose, and sinuses connected with it; but the point of concentration is frequently transferred from one place to another. When inflammation becomes fixed in the lungs, and shows concentration there, by the pleuritic stitch, the phenomena of pulmonic fever succeed. When primarily, or consecutively, it fixes in the muscular system, the disease is rheumatism, which, by varied and changing points of concentration, unfolds, in open view, the nature of metastasis, the pain, heat, and tumefaction subsiding in one place as they occupy another. Thus general disease is maintained in a manner, somewhat departing from the character of symptomatic fever. It often happens in cold seasons, that, with some topical affections analogous to those causing

symptomatic fever, the principal irritation manifestly belongs to the abdominal viscera; and in this event it is believed invariably true, that some modification of typhus will be found to exist. It may then be stated, that the character of fever is diversified by the relation, which the part principally irritated bears to the system in general: and that it is symptomatic according to the determinate fixure of its cause; and may be considered idiopathic according to the facility of change in place, which happens to that cause.

Malignant disease, from the state of ulcer to that of fever, seems marked by destructive concentration. Fever in this state, perhaps more frequently than all other forms of disease, has constituted the character of epidemics. And though epidemic disease may be capable of assuming all forms, yet these probably depend on some common injury, which varies in ultimate consequences, according to the importance of the part, on which the weight of disease principally settles, and upon its quantity thus concentrated. When the disease appears in the form of fever, its onset is frequently sudden,—the immediate cause is either insensibly made, or it is so rapidly produced as to escape the notice of the most vigilant observer. But in the midst of the most fatal plague, there are certain milder cases to be observed. These, it is true, may either have less of the common malignity, or they may be

radically different. However, from multiplied observations of disease in periods of pestilence, it would appear that a common taint was every where perceptible. Fever has been noticed to be converted into local disease, and local disease into fever. Particular circumstances have been supposed to influence these decisions, and changes. It has been said that fever was not a disease of the open field, but frequented camps, and other places, where men were crowded together for the purpose of shelter; that it most frequently commenced the attack subsequently to rest of body after severe fatigue, desultory exertions, &c.; that where the remote cause existed in great force, disease for the most part appeared in the form of fever, but when the cause might be in diminished force, that ulcers of the legs, and leprous blotches upon the skin, were the ordinary marks of its operation; that a sudden cure of these exterior local affections was apt to be followed by fever in genuine form, &c. But fever, which cannot be called malignant, does sometimes exhibit similar changes. Disease having a determinate seat, as dysentery in common seasons, will occasionally change to fever. The difference in fevers, then, as to violence, may be sufficiently well distinguished by the usual comparatives *mitior* and *gravior*. But at the same time, it is confidently to be presumed, not only that the remote, but also the proximate

cause, and the nature of the disease itself, are more strongly marked in its higher grades.— And, except when malignant fever has proved fatal at the onset, too soon for an irritating cause to have fixed the marks of inflammation, the records of dissection will show that local mischief did appear, and that, where the symptoms had indicated the principal suffering.

With respect to ulcers of the extremities, and leprous defædations of the skin, which appear to hold connexion with fever, it may be sufficient here, barely to remark, that inasmuch as these appearances are often found connected with faults in the digestive organs, they may also be considered vicarious of internal evil, or irritation, the operation of which, in other instances, is to produce fever ; thus, they witness to the fact, that the febrile cause is seated within the abdomen.

We will next consider an epidemic disease of comparatively mild character—the influenza, which has often been noticed in the train of pestilential diseases, and would appear sometimes capable of constituting their malignity. This disease has been witnessed very frequently in our country, and at each different season of the year. It has prevailed in certain towns and districts, when typhus, spotted fever, and malignant pulmonic disease, have visited other places, sometimes very near in its vicinity. Ty-

phoid appearances, however, have very rarely been seen blended with it, except in the cold seasons, as the winter and spring. Cold and wet weather, seem, generally, to have attended its appearance, and have been accounted a principal cause of it. But there are circumstances, some of which I shall have occasion to notice, which might lead us to believe that hot weather had first impressed upon the body a predisposition to disease. Its immediate cause may then be of complex character, a sort of hybrid nature, a combination of mischief made by heat with derangement made under the influence of injurious cold. The symptoms distinguishing the disease, have a corresponding strangeness; exacerbations occur with great irregularity as to time and character; at one hour, there will be almost incessant sneezing, with copious streams from the eyes and nose; at the next, these appearances may cease as if disease were finished; again they may return, or a new set of symptoms may succeed to them, as soreness in the lungs, accompanied with a teasing cough, &c. Again, severe pain may fix about the eyes, with considerable fulness and excitement of the part affected; sometimes the pain will fix in one eye, or just above it, in a spot as small as that of the *clavus hystericus*; inflammation, sometimes more firmly fixed, may occupy one or both eyes, one or both the frontal sinuses, and proceed to sup-

uration; but for the most part, the pain gradually, or at once, subsides, after having raged several hours; inflammation sometimes becomes firmly fixed in the lungs with a corresponding grade of pyrexial excitement; and when the systematic turmoil perceptibly begins to decline, something of the tertian character may be observed in the order of its stronger exacerbations, and usually continues for three or four periods; when, apparently, the disease has terminated, it may suddenly relapse upon the slightest exposure, and thus be protracted many weeks.

Colds are seldom mentioned by writers on tropical diseases, nor are they often spoken of by people who have visited the hot climates: instead of a cold, a fever appears to be the common consequence of exposure. It is true Lempriere has noticed the occurrence of colds on the banks of rivers, &c. in Jamaica. In his tables of diseases, he has even put down *catarrhal fever*, but has no where given a description of it. Indeed, I do not know that the disease which we call influenza, has ever been recognised within the tropicks. Nov. 1799, during a cold north wind off the coast of Florida, the ship Merrimack had its crew generally affected with influenza, but on going into the Havana soon afterwards, this disease disappeared as a snow ball might have wasted.

But in order to exemplify the connexion of

diseases, which probably depend upon the same remote causes, and to remark upon their difference connected with peculiarity of the proximate cause, it may not be deemed unsuitable to take a view of diseases occurring in a series, and influenced by change of seasons. For this purpose it may be allowed me to state diseases, as they were observed at Newburyport, after the remarkable heat which distinguished the summer of 1820.

Remittent fever, which began in July, continued to occur throughout October. It appeared principally limited to the south part of the town. There were a few cases of greater severity, marked by malignant symptoms, yellow skin, black vomit, &c. in September. These were confined to a small extent of ground, a ridge, having the river on one side, and a low plat on the other, to which it is said the tide formerly had access. In one of these cases, which did not prove fatal, the symptoms of the acute stage were entirely similar to those of the remittent generally; but after four or five days, there was a space of one day, in which a crisis appeared to have finished the disease; yet afterwards, a very frequent and weak pulse, deep yellowness of the skin, general uneasiness, and great debility occurred suddenly; the alvine discharges continued to exhibit a dark green appearance, and the urine was high colored, as if strongly tinged with

bile.* Several patients, at a distance from this neighbourhood, were similarly affected about the seventh day of the remittent, but without the yellowness. These were very apt to sink under the sudden oppression; and unless carefully watched, and supported by wine, cordials, warmth, &c. a very few hours would put the case beyond the means of relief.

As the cold weather became considerable, late in the autumn, the influenza commenced, and continued through the winter and spring. After the first flight of snow, last of October and first of November, it became very rife. The remittent had disappeared altogether.

About the time the influenza was first noticed, last of September, one or two cases of jaundice occurred. Afterwards in the winter, an unusual number of people were affected with this disease. The last case occurred in May. In some instances, exacerbation and remission were perceptible, but in others no febrile commotion could be distinguished; yet in all, oppression at stomach, precisely the same as is complained of in fevers of type, was a leading symptom, and was much more considerable at some particular period of the twenty-four hours, usually in the evening.

In January, February, and through the spring,

* I did not see this patient, but have full assurance of correctness as to the facts.

cases of typhus were occasionally met with. The number of these decreased with the approach of warm weather, but the intensity of disease, in those in whom it did occur, was not abated.

There were other diseases current with the typhus, as ileus, erysipelas, sore throat with rash upon the skin, croupy affections, rheumatism, &c.

Individuals who had just recovered from the influenza, being much chilled in their exposures to the cold, were suddenly taken down with fever and sore throat. With these the course of fever was rapid, distinguished by severe nervous affections, and occasional paroxysms of delirium. At the crisis, aphtha suddenly crusted over the whole mouth and throat, and errattick pains would shoot along the limbs "as if in explosions." In some instances axillary and other abscesses were formed, and seemed to terminate the fugitive pains; in others rheumatism would become fixed in the limbs, and thus distinguished the sequel.

Some relation to the autumnal remittent, by means of a local cause, or "latent mischief," which might remain in those who had escaped the remittent, and which might modify all the subsequent forms of disease, is presumed. Care was taken to ascertain whether subjects of the remittent were exempt from influenza afterwards, but observations were not made with

sufficient exactness, nor to sufficient extent, to allow me now to declare the fact. Nothing occurred which could make directly against such supposed security. No one, who had suffered by the remittent, was known to be affected with the subsequent jaundice, or the typhus of the winter.

That a local affection of the liver was necessary to the remittent, is inferred from the bilious appearances uniformly accompanying it. But between this morbid result of the operation of heat, &c. upon the system, and the evolution of fever, consecutive effects might intervene, and constitute the proximate of fever. The connexion of the liver with the abdominal viscera by means of the refluent blood from them passing by the vena portarum, makes it obvious, that any irritation produced in that organ, which might cause constriction of its capillaries, must cause a venous plethora throughout the abdomen. And it cannot be supposed that such fulness should fail to create uneasiness, and with it, increased or irritated action. The inflammatory process thus founded, may as readily become concentrated, as if it had occurred in the lungs, or any other part of the system. And provided this take place in the stomach directly, or be transferred to it from some other point, the train to the remittent may be found completed; the proximate cause is irritation, perhaps generally diffused

in the abdomen ; the first act of fever, is the sensation at stomach, produced by its receiving the concentrated excitement.

The yellowness of skin noticed in the few malignant cases which appeared in September, is believed to have been caused by bile regurgitated into the blood as in jaundice ; because the state of excretions manifested the presence of bile in all cases in which remissions were perceptible, even in apparent quantity corresponding to the degree of remission, greatest at the crisis, &c. It is admitted that, in the malignant cases, it did not always appear till after the pause ; when it did, it marked a mildness of the disease : and here, doubtless, remissions might occur, although imperceptible at the times of observation. It is remarkable that this pause, so characteristick of malignant fever, especially when produced under the influence of great heat, should seldom be followed by the ordinary febrile phenomena. But inasmuch as almost all diseases have a short run, in a ratio of their violence, this peculiarity may be derived from the varied operation of a common cause ; the irritating principle being more determinately fixed, that relief, which in milder cases happens from remission, is not found, and the life of the part primarily sustaining irritation, is either exhausted, or may be so greatly impaired as to make recovery difficult. The frequent failure of life succeeding to this

pause, might lead us to think some radical difference of cause existed, were it not known that life, in this delicate situation, might be preserved by supporting the common movements of the system for a space of time too short to allow the idea of destruction, or even very great exhaustion of the powers of the stomach. When these powers are very greatly crippled, or the organization of the stomach ruined, death may necessarily succeed; and there may be no sensibility left, by which the turmoil of fever can be reproduced. When such mischief is not effected by a first attack, or paroxysm, the oppression which follows the intermission, remission, or pause, may be viewed in the light of a new attack, or paroxysm, having the same character as at first, but in an increased, and often in a fatal force. Hence it is inferred, that there is no essential difference in the predisposing, the remote, or proximate causes of fever, whether it be continued, remittent, or even intermittent, except in degree.

That "latent mischief,"* founded in the hot

* This expression has been very much used by practical writers; and by it, they probably understand a contamination, produced by animal effluvia, marsh miasmata, &c. which waits the occurrence of certain causes, as heat, cold, moisture in the atmosphere, &c. to produce fevers. But by its use here, it is intended to designate an inflammatory state of the liver, or such condition as exists, when an undue determination of blood to this organ by the hepatic artery is established.

season, contributed to produce the jaundice which appeared in the autumn, and afterwards, cannot easily be rejected. For, in the depth of winter, when this disease was most frequent, it will not be supposed that miasmata were present; it is universally admitted that frost not only suspends their evolution, but destroys them already formed. Should it be said miasmata are not necessary to jaundice; whatever might have been its origin, as to causé, the facts are to be stated, that all diseases of that period exhibited tokens of hepatic affection; that mercury was as decisively remedial in the jaundice, as it has been found to be in hepatitis, a disease peculiarly the native of hot climates and seasons, and a stranger to the cold. It is well known that people from cold countries are readily susceptible of malignant fever in the hot; and if the reverse has not been so fully ascertained, yet it has been repeatedly noticed, that those who have gone from a southern to a northern climate, have discovered uncommon liability to typhus in its worst form. A similar predisposition bred in the summer, may be developed in the winter; and the principle on which such liability or predisposition depends, may be, that local irritation had been formed, but general disease had not been induced; the cause remaining in the latent state. However, new causes, afterwards, produce derangement in a different suit of parts,

and general disease is induced, corresponding in the main to the character of parts last injured, but receiving modification from the latent mischief. It may be true that general disease diminishes the facility of the system to be roused into febrile commotion, even from the operation of new causes. It may also happen, when the operation of heat, &c. upon the body, shall have produced a tendency to constriction of internal capillaries, that the action of cold upon the surface, the lungs, &c. shall indirectly oppose that tendency; and provided the subject do not escape altogether, yet local disease may take place in the internal organ sustaining local mischief, as in case of the jaundice we have noticed.

In the winter, the influenza and typhus were so intimately connected as sometimes to make it doubtful, to which the case should be referred.

In general the influenza was preliminary to the typhus, and ultimately appeared to be converted into it. The flying pains in the limbs and inflammatory affections of the throat may be referred to its catarrhal origin. Ileus, erysipelas, rash, &c. are supposed to indicate irritation in the digestive organs, which, differently modified, might have caused typhus. These, as well as the typhus, were generally preceded by influenza, a considerable time. Many facts related by practical writers, might be adduced in support of this view of the formation of typhus;

but it is thought best to rely on the explanation of symptoms, which we have ourselves noticed, in the attempt to demonstrate the immediate cause. Such may be the surest course to avoid injustice to others. First, then,

The distinctive symptoms of the typhus in question were a lurid countenance, frequent moaning, slow bowels, and offensive discharges ; the pulse in some were altogether natural, in others frequent and depressed, in others frequent and full, in many they were irregular. In some there was considerable soreness of the flesh, especially manifested upon being handled in moving them, &c.

The lurid looks, and moaning, indicate considerable suffering ; but the patient, questioned if he feels pain, answers, no : he will, however, acknowledge uneasiness, and in particular, about the stomach and abdomen ; he appears unwilling to converse much, though what he does say, seems sufficiently prompt and correct. The dejected, or forsaken expression of countenance, gives the idea of defect of animal power ; but getting up, laying down, turning in the bed, and even walking, are sometimes performed with apparent ease. The depressed and hobbling pulse express considerable diminution and embarrassment of vital power ; yet a speedy recovery sometimes proves the vital powers were not impaired. The deep moaning is apt to strike by-standers with an

impression of fatality ; it is not such note as is uttered when keen pain is felt, but such as may be presumed were the brain oppressed, or the vital current in the bowels choked. When there is much soreness of the flesh, the patient, generally, will preserve the attitude and appearance of sleep ; yet by signs of pain when disturbed, by answering questions, &c. he will often convince us that he was not asleep ; he does not move, nor moan, because it gives him pain ; he assumes the state of sleep, because the exercise of any sense augments his misery. Though delirium cannot be said to exist, yet it does not appear that the mind is fully conscious of the sufferings of the body.

Evacuations procured by purgatives in this disease, were often a dark green, but more frequently, especially when the progress of disease had somewhat advanced, they were of sooty blackness, without consistence or tenacity, and extremely offensive. These discharges being promoted daily during the continuance of fever was singularly beneficial ; indeed the fever commonly terminated with a salutary change in their appearance ; the relief obtained at each movement was strikingly similar to that of topical bleeding in local inflammation. I do not undertake to determine whence this black material was derived, whether from rupture of incipient veins, from exhalants terminating in the alimentary tube, in-

stead of mucus, or from the liver, being a still more vitiated secretion than the dark green bile; evidence from repeated dissection should accompany such explanation. But from many symptoms, particularly those of distress in the abdomen, sometimes tumefaction and tension which no estimate of the quantity of fecal contents, no tympanitic signs perceived, nor other cause than accumulated blood, could be supposed to have formed, it is inferred that vascular congestion was the leading principle of irritation. A congestion not so much derived from constriction of the hepatic capillaries, as from constriction of those belonging to the surface, or exterior parts of the body. A difference which, I apprehend, constantly obtains in the chain of causation, and essentially contributes to establish a distinction between fever peculiar to hot climates and seasons, and that which is peculiar to the cold.

Petechiæ, as well as other symptoms which appertain to typhus, were sometimes seen without a marked affection of the brain; but in no case without the dark, or black appearance in the fecal matter. Certain cases commenced with great coldness, darkened aspect, and in some instances with pertinacious vomiting. I have witnessed patients to have their fingers and hands somewhat swollen, with a degree of coldness which appeared to me lower than the temperature of the room. Those affected with vomiting

often expressed a strong craving for cold water, which might be no sooner swallowed than ejected; yet without abating the desire for it. In all these instances the application of heat to the skin, by the bath, would suddenly change the coldness and darkened look to burning redness. In this state, cathartic remedies, and frequently wetting the body with a sponge dipped in warm water, would accomplish a very ready cure.

Seasons distinguished for inflammatory complaints have, nevertheless, produced sporadic cases of typhus, especially, in those much exposed to the cold and wet weather; than which perhaps no cause is more sure to have effect. But dysentery in connexion with typhus is of common occurrence, and is known to change to fever in genuine form. Even when existing alone throughout, its course, period of change, and termination have been observed to correspond to the character of fever prevailing at the same time. If, then, the remote and exciting causes of these diseases, as the fact would appear, are the same; if a venous plethora in the viscera of the abdomen be first formed in both, their difference must be founded in some modification of the local irritation, or the proximate cause. Of course, the character of that necessary to dysentery being known, may serve as guide to the nature of that necessary to fever. There is no reason to doubt inflammation of the colon, or rectum, to be the

immediate cause of dysentery. Effusion, the consequence of inflammation, constitutes the discharges peculiar to dysentery, while fecal matters are retained above the seat of that inflammation. Now, irritation which depends upon a diffused congestion, must in the first instance be diffused also. But if this diffused irritation becomes concentrated, and inflammation be fully developed in the colon, the disease is dysentery. But, as some time happens, if fever appear in connexion with dysentery, the irritation of feces retained above the seat of the dysenteric cause, with such as may still belong to the congestion, may be supposed capable of concentrating at the stomach; and in such case, whether the dysenteric symptoms shall wholly cease, or not, the phenomena of fever may succeed. We frequently meet with cases of fever founded in the suppression of dysentery by the use of unsuitable remedies; and there is a natural order of disease to be observed, as to the succession of forms. Thus, diarrhoea shall occupy the first stage, dysentery the second, and fever the third. The reversed order may sometimes be also distinctly traced; as fever occasionally terminates in dysentery, diarrhoea, &c. From which occurrences, it may be inferred, that evacuation from the seat of irritation may diminish, and even change the febrile cause; and, on the contrary, that defect of effu-

sion, or of evacuation, may be a requisite state of irritation causing fever.

It is said that cold repels the blood from the surface and extremities, and produces engorgement internally. When in considerable severity, whether from degree of intensity, from circumstances which increase its power, or from duration, it overcomes resistance made by the system, the action of capillaries in the skin, pituitary membrane, &c. is diminished; but, unless the processes of life be wholly suspended, those of internal organs, seated beyond the direct influence of cold, must necessarily be increased. If the calorific process be conducted by capillaries, it must be chiefly maintained by those distributed internally. The greater quantity of food usually consumed by people inured to the cold, demonstrates increased activity in the digestive and other processes maintaining life. From these and many other circumstances attending the operation of cold, it is believed its noxious influence is especially operative, in producing opposite states of excitement in the interior and in the exterior parts of the body; and from which the accustomed balances of action are interrupted; the natural movements of the whole system, if not perverted, are yet reduced to new arrangement, in which the exterior parts, sedatively affected, show increased ability to act when the suspending cause ceases; interior parts,

on the contrary, have been inordinately stimulated, and, if not otherwise diseased, have sustained diminution of power. Doubtless it may be true, that all parts of the body acquire strength by exercise, gradually increased; but sudden exertions, and greater than are ordinarily practised, diminish power, or rather, produce temporary disease. For instance, when the limbs have been violently exerted, tumefaction and soreness, or a condition of inflammation may succeed, especially perceptible after a space of rest. Here, it is not to be presumed, that solution of continuity was effected in any of the fibres of muscles so exercised; but there is sufficient evidence of debility, engorgement of blood vessels, and determination to the part affected. A similar condition may obtain in the central organs subsequently to strong impressions of cold; but perceptible inflammation may not always follow; excitement, succeeding in parts which had undergone restraint of action, may divert the determination from the interior seat of injury; nor is the tumultuous action of the arterial system, the glow on the surface, &c. which resemble the febrile exacerbation, to be accounted proof of fever actually existing; these appearances, for the most part, presently subside, and without leaving morbid consequences. In established fever, we do not merely find whole suits of parts opposed in regular grades of excessive, and defective excite-

ment, but violence concentrated in individual organs; instead of an ephemera with entire disappearance of disease, or an equilibrium produced upon the first subsidence of commotion, a part remains irritated. Perhaps some defect, unperceived before the general excitement, or accident subsequently, might account for such local evil. When, however, a local irritation does exist, it appears to stand as cause to the general disease which follows. If the central organs have sustained diminution of power, or derangement, which shall not be so soon restored as the exterior excitement shall subside, irritation may be considered already founded in parts especially concerned in the production of fever. And if fever commence after proof of local disorder had existed in the previous symptoms, why should not the local disease be presumed to make the beginning, or to be the proximate cause of the fever? And if such local cause be susceptible of metastasis, as is seen in rheumatism, may it not explain those changes which appertain to fever? And also, the occurrence of crisis, and of conversion to other diseases, at every period of its course?

It will not be denied that the digestive organs are diseased at the onset of fever, and remain so during its course; nor that inflammation does sometimes occur in them connected with the fever. Common consent may also permit the statement,

that the symptoms of general disease vary according to the different parts which inflammation may occupy. Still, it may be contended, that, if irritation be concentrated, and thus becomes the cause of symptomatic fever, it is not so in idiopathic fevers. The question may still be returned, does not fever exist independently of local irritation? Without undertaking to parry logical distinctions founded in the etymology of words, but endeavouring to keep in view things which the words represent, I would reply, that, for aught which can be discovered, both general and local disease, both idiopathic and symptomatic fever spring up under the influence of the same causes. And it does not seem probable, that circumstances of health in the individuals attacked, and which may constitute aptitude to one or the other form, should so much change the essence and nature of disease, that laws distinctly seen to prevail in one case, should cease to operate in the other. If then, by any chain of cause and effect, we can show where fever begins, we surely exhibit its proximate cause. And provided we do this by observing the operation of causes well known, the result should hold generally, notwithstanding unusual appearances now and then may be noticed, which cannot be explained.

In a climate like ours, cold is familiar; its effects on health, and disease, are largely experienced:

it may be presumed, of course, that, in its effects, principles essential to disease may be found.

But different parts of the system sustain contrariety of injury from the operation of cold; and it may be said the combined effect, or generality of disorder, should be considered the foundation, or complicate cause of fever which may follow. With the celebrated Fordyce, it may be contended, *that if cold produce fever, it does this at once, or makes "such symptoms of it as afterwards spread over the whole system, so as to make a complete attack."* But in this place, we cannot forbear to notice other statements made by this author, e. g. *that the application of cold must be sudden, and after the body has been overstimulated by heat, in order to produce fever at all. In cold seasons many cases of catarrh, pneumonia, and rheumatism occur for one of fever. In fever, certain parts of the body suffer more than others. Fever "is undoubtedly a very considerable irregularity;" inflammation is also an irregularity, is made by the fever itself, frequently carries off the fever, although sympathetic commotion may continue along with it. Danger "arises also from the blood being propelled from the exterior parts, in the time of the attack, to the large internal vessels: but especially to the vessels of the abdomen, and particularly those of the spleen and liver."* To understand the meaning of these expressions and sentiments, it will be necessary to have constantly in view the *key note* of this dis-

tinguished writer. "*Fever is a disease the essence of which is not understood.*" Thus, cause and effect may very naturally be blended: a mind satisfied with distinctions predicated on appearances only, must be liable continually to mistake the cause for its effect, and the reverse.

It is believed seldom the case, that the severer forms of even symptomatic fever commence with the first impressions of cold; uncertain or fugitive symptoms usually precede the attack; and, from repetition of exposure, from metastasis of the cause, &c. it happens, for the most part, that pneumonia, rheumatism, and sometimes typhus are subsequently introduced: as when pulmonic fever succeeds to catarrhal inflammation, irritation in the lungs no sooner produces systematic commotion, than appearances of inflammation in the pituitary membrane of the nose, &c. are suppressed.

Congestion in the vessels of the abdomen may take place from the operation of cold simply. And if such be the foundation of fever, the disease may be typhus in its most simple state. But visceral congestion may occur as an effect of different causes, or may be produced in different ways; from constriction of the hepatic capillaries, in consequence of an inflammatory state of the liver; local disease in other viscera may cause defective excitement, or constriction of capillaries, in distant parts; and thus, the local plethora im-

mediately depending on excess of vascular action, may be greatly increased. Do we find gastritis, enteritis, or peritonitis, unaccompanied by symptoms common to fever? It is from the acuteness of pain, chiefly, that we distinguish these diseases. The typhoid state is often observed in pulmonary consumption; and so varied are the sympathetic derangements which succeed to disease of an important organ, that it is not difficult to imagine occurrences which may naturally involve a congested state of the abdominal viscera. I say nothing of particular affection of the brain, though it must be liable to sustain primary injury; because cases of fever have not occurred in which I could feel satisfied such injury had caused the attack; and there are cases in which the head appears to suffer very inconsiderably, until near some critical period; delirium has been said to mark the change, &c. Difference of manner in which abdominal congestion is produced, may vary the character of fever growing out of it; but unless such diseased plethora be intermediately established, I apprehend the remote causes of fever, will invariably fail of ultimate effect.

Typhus is often found connected with infarction of the alimentary canal by scybala. These may irritate by acrid qualities, or by their bulk. But however this may be, it can hardly be imagined that such collections should have been formed, had the part occupied by them retained its healthy

state. Passive debility, at least, must be presumed, and of course, liability to vascular congestion.

Chronic enlargements of the spleen and liver subsequent to intermittents, and tubercles in the lungs which have been imperceptibly formed, may be sustained an indefinite length of time, unless accident, or some exciting cause, occur to make irritation.

In hypochondriacism there is evidence of debility, congestion in the digestive organs, with irritation sufficient to cause sympathetic action in great variety; its symptoms obstinately maintain the chronic character; yet, as if instinctively aware of danger, the subject is continually in dread of cold, dampness, and of other causes which might induce the acute state.

The causes of scurvy, in many respects, are similar to those of typhus. They are diseases equally observed among people crowded together, who have been meanly fed, badly clothed, and exposed to the action of cold, dampness, &c.—And to show the agency of cold in producing them, it may be sufficient to notice the fact, that warm clothing, warm food, hot beverages of tea, coffee, &c. are found the best preventives, and the most useful remedies, in avoiding and treating them; wherever they appear to arise spontaneously, i. e. without specific cause. Deficient heat is thus directly supplied, and is promptly remedial; but if, by wine, ardent spirits, &c. the enfeebled

system is urged to create it, the design may fail, or if it succeed, a still greater waste of power will be sustained. It is not denied, that living on salted meat, and privation of vegetable aliment, contribute to the formation of scurvy; but it is believed these circumstances have less importance than is commonly attached to them. If scurvy be peculiar to ships on long voyages, and sailing in cold seas; typhus is as constantly attached to a camp in the cold seasons, and also to the wretched habitations of the poor, and to ships sailing near the land, lying in harbour, &c. The changes of temperature are greater on, or near the land, than on the ocean. It is a common remark, that colds are not contracted by exposure to bad weather at sea, as is the case on shore;—perhaps the difference of disease under these circumstances, may rest on the principle, that the same states or vicissitudes of the weather which produce colds, are causes of fever.

Congestion in the viscera of the abdomen is believed necessary to fever; because symptoms of the attack indicate such a state; because evacuations which diminish these appearances, subdue the fever also; and because heat and cold, having a general influence as predisposing causes, appear naturally to produce such diseased fulness.

Irritation supervening upon the visceral congestion, and causing morbid sensibility in the

stomach, is believed the proximate cause of fever ; because oppression about the precordia appears to be the first symptom of the presence of fever, and disappears only with its cessation.

The character of irritation causing fever is believed inflammatory ; because malignant fever manifests the speedy development of inflammation ; because the same remote influences, which produce idiopathic fever in certain instances, do in others unequivocally cause topical inflammation with symptomatic fever ; because local diseases undergo commixture and communication with fever, and because local inflammation and fever have many corresponding traits of character. Is it the property of fever to exacerbate ? The same may be seen in inflammation. Does fever terminate by crisis ? Inflammation disappears by resolution. Are the causes of fever held in check by the mind's being intensely engaged in the execution of interesting affairs ? In the same manner, a small wound may not be perceived, nor will it inflame unless sensation be first excited.— And in all respects, idiopathic and symptomatic fever exhibit appearances of such strong similitude, that the cause of one known, is presumptive evidence of the nature of that which may be concealed.

The stomach is allowed to hold a distinguished share in the turmoil of fever ; and being the common centre of organic sympathies, irritation, probably, must be felt in this organ before fever

can take place. But the requisite degree of irritation must be presumed to fall within certain limits; for there may be supposed a grade too low to have effect; and also, a grade too high to admit those sympathetic changes which distinguishes fever from many other diseases.*

* The two following cases in which death occurred from effusion of the contents of the small intestines into the cavity of the abdomen, may show that great irritation has a sedative influence upon the system at large, and which may be so steadily maintained as to preclude the train of fever.

January, 1808, ——— a lad a dozen years old, first had the symptoms of common ileus; on the third day, plentiful evacuations from the bowels were procured; he appeared entirely relieved; but on the fourth day, he complained, suddenly, of severe pains throughout the whole abdomen, and had no evacuations. The countenance was shrunk and ghastly; the pulse feeble; the natural warmth at the surface appeared diminished; there was no delirium; he died at night, without struggle, and his intellect unclouded to the last. By examination, a small hole, perfectly round and smooth, without appearance of inflammation connected with it, was found in the lower part of the ileum; much of the liquid contents of the intestine had been poured into the cavity of the abdomen; a light blush of inflammation occupied the viscera.

July, 1811, ——— a truckman, after supper, received a kick from his horse in the left hypochondrium. There was no marks of injury externally; complaints, appearances, &c. similar to those in the boy, as above stated; excepting a remarkable fulness of the veins was noticed in his hands and arms; small bleeding appeared to produce faintness, with subsidence of the veins, but their fulness returned as the faintness went off; he died the next day at noon. On opening the abdomen, the liquid contents of the intestines were immediately seen; a small jagged aperture in the upper part of the

And because fever is a disease subject to continual changes, the appearances in dissection cannot be relied on as furnishing any sure criterion of its incipient cause ; many ultimate consequences are wholly distinct from the local violences, which exist at the commencement ; and local affection, which might have constituted its origin, may have disappeared under critical determinations to other parts ; even these may have disappeared, and yet death may take place. There is a sentiment in point made use of in the writings of Dr. Rush. “ —Death in this, *as well as in many other cases in which medicine had done its duty*, appeared to be the inevitable consequence of the total abstraction of the energy of the mind in restoring the natural motions of life.” Certainly there are cases in which death appears to take place from exhaustion, or the sudden cessation of excitement, immediately subsequent to a crisis. And in this event, if the local cause had made perceptible impressions, these, it must be presumed, would disappear with the disease.

jejunum, was the only mark of primary injury found internally. The peritonical envelope was extensively, though but slightly inflamed.

Here, it does not appear that death succeeded to the effects of inflammation ; but rather, that the functions of organs irritated might have been suspended, and that the movements of life, generally, were gradually diminishing to the time of their final failure. The sudden and great oppression at the commencement of fever, sometimes, appears to terminate life still more speedily.

Difficulty in finding the marks of a local cause, cannot be proof, therefore, that such had not existed.

Cases of fever are occasionally met with, in which symptoms of termination appear at some usual period of crisis; yet after some short space of time, coldness of the surface and extremities, and other signs of beginning fever, set in suddenly, and extinguish life. In this state, as well as in the severe cold stage, which sometimes attends the commencement of fever, vesicatories, and heat applied to the skin, wine and other cordials taken into the stomach, &c. may divert the tide of fatal oppression; and provided *the natural motions of life* may be maintained but for a single day, health may be readily re-established; but otherwise, should the patient escape immediate death, fever in the adynamic state is apt to proceed with great uncertainty of duration and event. Such changes and consequences frequently occur in hot climates. And although conclusive proof of the proximate cause cannot be derived from ultimate occurrences, yet the fact deserves to be mentioned, and from the authority of almost all writers upon diseases of the tropics, *that the great majority of men worn down by fevers, suffer principally, from chronic disease of some of the viscera contained within the abdomen.*

In regard to the question, whether there be specific difference in the nature of fevers? it may

be said, that were it safe to admit the essential nature of fever to be the same in all climates and seasons, because many of its phenomena, and most of the means of treatment are similar; yet, a distinction might be contended for, on the ground of difference in the manner of their production. By heat a condition of the body is established, the reverse of what is effected by cold; the exterior parts are directly stimulated, while a sedative influence is maintained internally; the appetite is diminished; digestion is difficultly performed; the peristaltic motion of the intestines, the secretions of bile, and of urine, suffer abatement; increased energy of the arterial system is directed to the surface, until disease produce changes in this common order of things. Besides differences already noticed, it may not be amiss to add the remarks of Dr. Fordyce in regard to remittent and continued fever differing in the time of attack; the remittent coming on in the morning, but continued fever in the evening.— These conditions of fever I understand to be correctly designated by the terms *fevers of type*, and *typhus*—a distinction which is believed to hold good with respect to fevers of the opposite climates; the fevers of hot climates commence for the most part in the day time, and are referable to fevers of type; on the contrary, typhus, like catarrhal disease with which it is often connected, is bred in the cold, and commences at night.

But if the effects of fire and frost are discriminated sometimes with difficulty, the lesions made by these opposite powers, must in the beginning, if no where else, require an appropriate treatment. The means of guarding against the effects of excessive heat or cold not only are invariably included in the rules of prophylaxis, but through the whole course of treatment, regard is had to the management of these agents. If cold, indeed, be a remedy in fevers that prevail in seasons of frost, its powers are not to be considered congenial to the body, generally, but suited to the government of particular symptoms, the occurrence of which is conditional. And, if heat and cold are to be considered predisposing causes, it must be difficult to preserve a definite conception of them, as positives, under the general idea of plus and minus of heat. The common notions of animal effluvia and marsh miasmata constituting fevers of peculiar, and different character, are yet retained; and although recent observations may show the influence of febrific miasma to be less extensive than formerly was the received opinion; yet the occurrence of fever in people, who, for a short time only, have suffered their contact in sickly places, has preserved a conspicuous rank to these mysterious causes. Should it eventually be proved, however, that the typhus of cold countries, and the malignant fevers of the hot, are extinguished by a mutual change of

place, the distinction of species will be the more important. Forms of fever are here noticed as they appear in opposite climates; because in places where abrupt changes in the weather make it summer or winter for most of the year, just as the wind blows, the causes produced at one period may be extinguished by the properties of that which succeeds; or, the lesion of one period remaining may be blended with that of the subsequent, in a manner to constitute great diversity of hybrid cause.

That the malignant diseases of our hot seasons are arrested by frost, and that even other complaints, common to the summer and autumn, disappear with the approach of winter, probably will be matter of general consent; but, that typhus, a disease of winter, is equally limited to seasons of cold, may be contested. However, if the disorders of summer are constantly removed by the winter, it must follow in tolerable certainty, that disease peculiar to the winter did not exist in the summer, or had been subdued by it. Within the last thirty years, the observations of medical men, best placed to notice the influence of climate in changing the nature of fever, have gone far to support the fact. Physicians of fleets and transports, sailing from cold to hot climates, have declared the diminution of typhus as they changed the latitude, and its disappearance with the change of climate. Indeed, the sentiment

appears to have prevailed, that ships with typhus might proceed to warm climates with little danger of its continuance or fatality, provided the passage might be short.

The most common form of fever within the tropics is undoubtedly remittent. Intermittents, cholera, and continued fever are varieties depending on circumstances of predisposition, of exposure, and of accidents to the health.

Cholera and continued fever occur together; they belong to the very hottest weather, and alike are most apt to attack strangers, or people recently from colder countries; severe affection of the gastric, and hepatic system, is remarkable in both, and it is often noticed that continued fever may terminate in cholera. The difference in these diseases would appear to depend upon the abundant evacuations, which distinguish cholera, and their suppression in fever, rather than dissimilarity of cause producing them. A difference, however, in the space of time they are forming, may influence the decision. Cholera being more rapidly developed, the morbid associations in the system are less extensively confirmed than in fever, and the primary determination is more generally conclusive.

It is of frequent occurrence in people, who enjoy good health, that, having sustained considerable fatigue, and being excessively heated, they at once give over exercise, commit them-

selves to the shade, or the cooling breeze for refreshment; and at the same time indulge too freely in stimulating drinks, and in eating. In the evening of the same day, a troublesome fulness is felt in the digestive organs; restlessness is perceptibly augmented, and during the night, or as it most frequently happens, the next morning, terminates in cholera.

Continued fever does not take place so rapidly. The opinion that it is often brought on suddenly, like stunning by a blow, must have grown out of the habit of considering the onset of fever, the beginning of indisposition. It is not very difficult to perceive its approach; one day, sometimes several days exhibit symptoms of preliminary disorder, and during this period it may often be prevented. But most writers upon tropical fevers contend that there is a continued fever distinct from the remittent. The remittent is allowed to have the appearance of the continued fever at its commencement, but it is said to be distinguishable by the remitting or intermitting manner of its approach, and by the distinct character it subsequently assumes. Whereas the continued fever is said to begin at once, without notice, and to consist of a single paroxysm, which holds steadily from twelve to thirty-six, or even forty-eight hours, and then terminates abruptly, the patient immediately sinking, or directly recovering; and although a

deceptive pause not unfrequently precedes the fatal symptoms, yet nothing of fever is seen in these symptoms. We have already remarked upon this peculiarity, and have nothing, in particular, to add here. But it is expressly stated that the effect of climate is to produce continued fever in strangers, at the sickly seasons, while long residents and natives sicken with remittents, &c. Now, notwithstanding the greater vigour of health in strangers, and their known liability to malignant disease, it is believed, that the length of time, in which the morbid cause has had influence, is especially concerned in determining the form. The seasoning fever, as it is called, is said to be continued; but when this takes place after a considerable period of residence, it is usually remittent. It often befalls sailors, who visit commercial places within the tropics, when they fall sick in the harbour, or on shore, that the disease will be continued fever; but when attacked soon after sailing from the place, the disease for the most part is continued fever at first; subsequently, however, it changes, and very frequently assumes the intermitting type, especially as they reach the higher latitudes.—Probably we should not greatly err, were we to consider an intermittent the most chronic, and the continued fever the most acute state of the remittent.

There are particular symptoms and circumstances, which distinguish the fevers of hot climates. The lungs are seldom affected by inflammation, and the muscles rarely suffer by rheumatism; but the hepatic system constantly sustains derangement, in which alternate excess and defect of action are perceptible. Irritation accompanying the fever, or as we say, causing it, concentrates in the stomach, and rapidly proceeds to inflammation. The degree of danger in continued fever, has been estimated by the effect of a certain blow inflicted upon the epigastrium. When the sensibility of this organ was such, as to exhibit signs of great suffering upon receiving a blow which ordinarily would not hurt, a fatal event was usually observed to follow; but when in this way, sanity of the stomach was ascertained, the violence of other symptoms was not found wholly to preclude hopes of recovery.

Abdominal congestion is frequently the effect of obstruction made in the hepatic capillaries.— But whether this be a primary effect of miasmata, or that it depend on some relative influence of other organs, must, like many phenomena in pathology, rest on opinion.

Fever appears to consist in unequal and unnatural action of the system; one part labouring with vitiated excess, and another with defect of the natural energies. Excessive and deficient action, excitement, and torpor, are terms used to

designate this irregularity. Each state undoubtedly represents an action of life; and either of them being produced in one part of the system, may be supposed capable of inducing its opposite in some other place. On this ground, spasm of the extreme vessels, or the negative influence, might still be vindicated as the proximate cause of fever. But from many circumstances of analogous operation, it would appear that irritation, or the positive state, occasions the capillary constriction seen in horror. A prick of the finger by a needle produces a chilling thrill that resembles such constriction. Many moral causes have a similar effect; and though we might shrink from the task of explaining how these produce a primary local affection, yet we may catch some idea of such a process by considering the horror felt at the deed of an assassin; we are conscious of our own brittleness; we imagine, we sympathetically feel the wound gashed by the unhallowed poignard.

But to come nearer to the subject in view, will it be contended, that sympathetic fever, arising from local injury, precedes the local inflammation? that pleurisy precedes the local affection in the chest? If, as in the laws of the electric and magnetic influences, the principles of animal life form the negative simultaneously with the positive, still we may be allowed to account that to be cause, which appears principal. In the laws of matter, attraction seems connected with repul-

sion; yet attraction is accounted the ruling principle. In the animal system, excess and defect of actions constituting the phenomena of life, may necessarily be concomitant; yet excess appears the leading influence.

In attempting to show the immediate cause of fever to be a definite result of previous morbid impressions, which, by deranging the salutary movements of the body, and disturbing the established harmony of its parts, cause a local mischief, we do not deny that fever, when produced, is a general disease in which illness pervades the whole. It is believed that different properties in the remote and exciting causes, modify the local irritation on which fever essentially depends; and that other circumstances continually diversify its appearances, and its course. To prove a radical difference in the nature of fevers, predisposing causes of opposite character have been kept in view. And on a subject of such wonderful variety as is that which embraces the phenomena of fever, it was thought the remarks of any observer might be of use. If heat and cold, prevailing in degrees of severity, stand prominently among the predisposing causes, the changes of temperature are not less conspicuous among exciting causes. So constantly do these come into operation, that it must be uncertain if idiopathic fever can occur without them. And it is not certain that opposite predisposing causes ever so blend

their effects as to constitute any simple form of disease. In seasons partaking of extremes, a strange mixture of lesions may continue to checker the field of malignity; and the protean guise of epidemics may long remain incapable of full description.

TREATMENT.

Since fever consists in irregularity of action, whether it be *sui generis*, corresponding to a remote cause of poisonous quality, or, that it be an inflammatory state of certain parts in consequence of excess of the natural action, its treatment obviously demands such means as may restore the natural equability. But, before the occurrence of symptoms which declare the actual presence of fever, there are signs of disorder which may, or may not be followed by fever itself. Not allowing such disorder to be an essential part of fever, it is considered to be a state of disturbance produced directly by the agency of remote causes; it precedes and accompanies the formation of local derangement, which subsequently excites the febrile phenomena, and of course, makes the fever. In this state, whatever prevents the local derangement, avoids the fever. And for this purpose, it will often be sufficient to avoid exposure to the hurtful causes; to preserve rest of body; to counteract the diseased disposition by mild eccoprotics, ptisans, &c.

But there is a subsequent state of system in which fever is acknowledged to be present, the morbid associations, however, are not yet firmly established. In this state, or *forming stage*, strong impressions, or shocks, are found decisive; an efficient blow, thus placed, frequently removes the whole disease; causes and their consequences alike disappear. These impressions are made by emetics, by cathartics, by cold affusion, and especially by blood letting when the vital organs are in great excitement. They may also abate the violence of the disease when too strongly confirmed to be controlled in its progress. Other remedies, with equal promptitude, may sometimes arrest the disease; and otherwise may moderate its extremes. Such are many articles of diffusible property, as wine, opium, &c.; tonics, as the bark, &c. Indeed, it does not always appear essential to success, what means are employed; it may be sufficient that a shock be produced, which may suspend the diseased associations; or in other words, which may dissipate the inordinate and morbid excitement in particular parts of the system. Thus it is, that equality being established, or local irritation removed, the phenomena of fever cease.

There is yet another mode of counteracting fever, and which sometimes entirely removes it. This is executed by making local irritation, from the use of vesicatories, giving mercury to produce

ptyalism, &c. These measures appear to countervail the disease, by concentrating irritation where its reflex action may not readily involve a fever; and under circumstances in which its power to affect the system sympathetically, is greatly diminished in consequence of discharge from the local disease that is substituted; many febrifuge drugs, the operation of which is seen only in the abatement of symptoms, or the subsidence of disease, may owe this effect principally to the evacuation they occasion from exhalants terminating in the stomach and intestinal tube, to the constricted mouths of which they are directly applied.

But although it be conceded that the knowledge of remedies is derived from observation of events alone, yet the known inconstancy of disease requires a knowledge of the particular state of the system, and of the immediate cause of its derangement. And it is believed few physicians fail to make some effort to distinguish what such cause may be, as well as to regard the more conspicuous phenomena. Ask those who take a group of appearances for their guide, to what point they find their thoughts directed when they deliberate about the means of cure? They may reply, that the cause they seek, may not be the proximate of fever, but a consequence, or concomitant of the disease, to prevent or to cure which, insures safety until a crisis, naturally oc-

curing, may terminate the fever. Ask, then, how it happens that aspersing the body with cold water can cut short the course of fever? Still it may be answered, that the immediate cause, as well as the remote, may cease with its first impression; and, it is by removing subsequent derangement that the patient recovers. But, unless efficient means are used to arrest its progress, it seems a determinate property of fever to continue gradually increasing for a certain time, and then to decline, or terminate at once, from the intervention of changes which naturally belong to the cause which supports it.

Should the present observations upon the proximate cause of fever, as has been the fate of all investigations of the subject hitherto, fail to designate that cause, it is yet hoped, that certain remarks have been offered, which may invite others to the task. The subject seems gradually to have fallen into neglect, probably owing to disappointment in expositions of high authority, which have failed to support the credit with which they had been too confidently received at first. Its importance, nevertheless, in relation to practice, is not diminished. However, I will not now be further tedious by enlarging in practical remarks of a general character, but will conclude by making mention of the *lobelia inflata*, used as a remedy, in cases of fever, and in febrile disorders.

I have commonly used the saturated tincture drawn with fourth proof spirit.

August, 1819. Capt. ——— returned from sea, sick of fever, which continued gradually increasing until delirium became continual ; the general assemblage of symptoms was alarming, but the brain in particular appeared to be the seat of greatest danger. Reflecting upon the diffusible properties of the lobelia, I determined to make trial of it, and gave twenty drops of the tincture, directing the same dose to be repeated every second hour. Next day, the symptoms were of milder expression, though not greatly altered. It appeared that the tincture had been regularly administered, and without producing nausea. The dose was then directed to be twenty-five drops, repeated as before. Afterwards, he very gradually mended by a regular abatement of all the symptoms, and recovered without crisis. As his delirium went off, he began to complain of the lobelia, even in a diminished quantity, when it was discontinued. Other cases were subsequently treated in a similar manner, and with the same apparent success. It should, however, be understood, that the usual remedies have never been omitted, to give trial to the lobelia alone.

March 8, 1821. Mrs. ———, aged 80, had been a few days ill of a supposed cold. On this day the symptoms of typhus were distinctly marked ;

resisting treatment, the disease increased till the patient was wholly confined to the bed. The tongue had become black, dry, and chapped; there was frequent sighing, and moaning, but without delirium, or pain (except sometimes a little griping, manifestly caused by cathartic medicine, which was occasionally used;) the pulse were extremely irregular; there would be one large beat followed by a considerable pause, and then two, three, or four small, rapid, but yet unequal beats; gave twenty drops of the lobelia; in ten minutes the pulse were reduced to comparative regularity, being rather slow and large, varying at different hours from forty to seventy beats in the minute; the dose was ordinarily to be repeated every second hour, but in case of nausea, to be discontinued. This appearing sometimes to be produced, the lobelia from time to time was omitted; when discontinued for a space of twelve to twenty-four hours, the pulse would be found irregular as at first; the lobelia again resorted to would show the same ready influence in controlling the arterial derangement. At the end of three weeks, the dry and black coating of the tongue and mouth suddenly cast off, and was succeeded by a thick crust of aphthæ; in a week longer, this had disappeared, and the patient gradually, though slowly, recovered her usual state of health. Wine had been occasionally given, but without benefit; it appeared to be

converted to a strong acid on the stomach; a table spoonful of brandy with water was substituted, but was soon found too strong; given but once in the day, it would cause deep redness in the cheeks, laboured respiration, &c.

There is a condition of fever in which purple spots, or petechiæ, some of which will be raised into small bumps, may be seen scattered over the body. Where the cuticle is fretted off from any of these, as frequently happens to those within the lips, and on the gums, blood is continually oozing out of them. The appearances of blood in the stools make it probable that the alimentary canal may also be affected in a similar manner. The pulse will be frequent and feeble, although other symptoms of febrile commotion shall be very inconsiderable. The lobelia was made use of in two such cases. The first, a teething child,* whose pallid looks indicated dangerous loss of blood when the lobelia was recommended. The second, a lad of a dozen years; ten drops were taken every second hour for two

* I saw this patient but once, in a consultation visit. The attending physician afterwards informed me that the lobelia was given two or three times, in the dose of three drops; that the oozing away of blood was immediately stayed, and did not subsequently recur; the child did not appear to have been nauseated, but after a few days it failed, probably in consequence of severe loss of blood sustained before the lobelia was administered.

or three days, except that it was not allowed to wake him from quiet sleep. The hæmorrhage was immediately suspended on taking the lobelia; there was not much sickness at stomach, yet the disgustful taste, and unwelcome impression, made great unwillingness in the patient to continue it longer. Accordingly it was omitted, but the hæmorrhage returning, it was again used, and with the same effect. The cinchona and wine were a while employed together, but at length the cinchona being refused, wine was allowed to be given alone, and as freely as the patient might comfortably bear it. Some days he had fifteen glasses of sherry without inconvenience; he recovered in three weeks.

In several cases of typhus attended with profuse hæmorrhage from the bowels, the lobelia has appeared immediately to control this dangerous symptom.

Cholera infantum is a disease with teething children in the hot seasons, often severe, and of peculiar obstinacy. In regard to some of its principal causes, and in many of its appearances, it would seem to have relation to remittent fever in adults. The irritation of protruding teeth renders the subject susceptible of relapses from the influence of changes in temperature that are sustained with impunity by others. It seldom happens that a cure is completely effected till towards the setting in of winter. In many in-

stances, when exhaustion had become alarming, and the pertinacity of the disease had resisted other means, I have given the lobelia, in the dose of two or three drops, with decided benefit; provided it does not cause puking, it may be repeated a few times after intervals of two hours. Its salutary influence may be seen in the cessation, or considerable diminution of the vomiting, and watery dejections; in the quiet sleep; the evident increase of fulness of the features, and a more plump and better appearance generally; the diminution of frequency in the pulse, and the warmth of the flesh being more equal and natural. It is believed relapses have occurred less frequently, when the lobelia has been used, than when apparent recovery has been had without it. When it has produced immediate puking, I have seldom given a second dose on the same day; but according to its apparent influence in abating the symptoms of the disease, have afterwards repeated it. It may be remarked here, that, as the fact appears in other diseases where remedies cure by impression, or shock, it will be more decisive early in the disease, than late, when morbid associations are more strongly confirmed; but perhaps with this difference, that it should not be applied till the symptoms of exhaustion shall be pretty strongly marked.

There are cases in which the lobelia appears to operate as a charm; its effect is instant, and

the disease may speedily and entirely cease. But there is a definite dose, thrilling to the fingers' ends, requisite to its remedial impression. In too small a quantity, it fails to counteract the disease; in excess, it overwhelms the system; instead of a shock, after which the powers of life presently regain their natural operation, the stamp of fate may be seen imprinted on the victim.

The lobelia has been much used by empirics, and in many instances, with murderous effect. In some cases of chronic diseases, which had worn out the influence of common remedies, this article, even daringly exhibited, has been productive of singular benefit. There are places where its remedial qualities have given it dangerous popularity. Some account of its use, therefore, showing its power in minute quantity, may not be wholly uninteresting. A remedy possessing such very deleterious properties, cannot be inconsiderately applied, but by hazarding all that is duty, or that may be safety, to the patient.

THE END.