An essay on pyrexia, or symptomatic fever, as illustrative of the nature of fever in general / by Henry Clutterbuck.

AN ESSAY

ON

PYREXIA,

OR

SYMPTOMATIC FEVER,

AS ILLUSTRATIVE OF THE

NATURE OF FEVER IN GENERAL.

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INTRODUCTION.

SEVERAL years have now elapsed since I submitted to the consideration of the Profession the *First Part* of an "*Inquiry into the Seat and Nature of Fever;*" in which I endeavoured to shew, from the whole history of the disease, that *fever,* strictly so called, or what is termed *idiopathic* fever, is, in its origin, a *local* and not a *general* disease, or disease of the whole system; and that it consists essentially in inflammation of the cerebral substance, while the *febrile* symptoms attending it, namely, heat of skin, frequency of pulse, foul tongue, and others, are symptoms common to it and other inflammations. This doctrine, as might have been expected, has been variously estimated. By not a few, it has been adopted with little reservation, and has had a corresponding influence on practice. The change, indeed, that has taken place in the general management of *fever,* within the

period mentioned, is very striking. Practitioners, with few exceptions, no longer entertain a dread of *debility*, as being the *essential* part of the disease, but consider this rather as the consequence of a previous state of vascular excitement—in the brain more especially; and they endeavour to prevent it, therefore, by *anti-stimulant* treatment at the outset of the disease. Few believe, at present, that a patient can be bled or purged into a *typhoid* state. On the contrary, it seems to be pretty generally understood, that such a state is more likely to be prevented, than induced, by an *antiphlogistic* mode of cure, provided it be promptly and actively applied; with the further advantage of cutting short, in numerous instances, a disease, which, however mildly it commences its career, is apt to run a protracted course, with daily-increasing danger to the patient. According to my experience, instances now rarely occur (except from neglect or mismanagement in the beginning) of fever running out to a term of three or four weeks' duration, as was frequently the case formerly;

and ending at last in a total destruction of the powers of life, principally through the injury done to the organ of the *sensorial* functions, the brain, which always appears to suffer in proportion to the violence and duration of the disease. In fact, the practice now most approved, and most generally adopted, in the treatment of fever, is, in all essential points, the same as that employed in the cure of inflammation in general; subject only to those qualifications and restrictions that naturally arise out of the peculiar nature of the organ primarily and essentially affected—a circumstance that serves to modify the treatment of all other diseases.

In the former volume, which contains the *First Part* of the proposed "*Inquiry*," I laid down the *general doctrine* of fever according to the principle here stated. The *Second Part* will contain the application of the doctrine to the different *varieties* of the disease. The publication of this has been delayed much beyond my original intention; partly on account of other professional employment, but chiefly in

order that time might be given for further observation; and, also, that I might be enabled to profit by the suggestions of those who adopted a different view of the subject. The result of the delay, however, has been a more settled conviction in my own mind of the truth of the opinions I had before formed.

The object of the following pages is to endeavour to shew that a *febrile* state of system, or what is technically denominated *symptomatic fever*, is always a *secondary* affection, the result of inflammation, and of no other cause. In this respect, the subject is of importance for the purpose of *diagnosis*, as it may lead us to discover the existence of inflammation in cases where it might not otherwise be suspected, that is, in cases where the local signs are not obvious, or with difficulty to be observed. It is not unimportant, likewise, in regard to practice; for although *pyrexia* be but a secondary state, it is capable of influencing materially both the primary disease (the inflammation which produced it) and the general system. Its influence on the primary disease is sometimes favourable,

sometimes the reverse, according to circumstances that will be pointed out. It is often the cause of greater suffering to the patient than the local disease that gave rise to it; and is sometimes the more immediate cause of the fatal termination, as in the case of *pulmonary consumption*. Persons dying of this most fatal of diseases, are more frequently destroyed by the *hectic fever* (one of the forms of *pyrexia*), and the disorder this occasions in functions that are essential to the continuance of life, than by the absolute destruction of the lungs themselves; which are seldom so much or so extensively injured in their structure, as to be altogether incapable of carrying on their peculiar function in a manner adequate to the support of life. Hence, our efforts are most usefully directed towards controlling the *hectic* symptoms, for over the local disease we have little power.

Pyrexia, or symptomatic fever, as a distinct subject of investigation, as far as I am acquainted, has hitherto attracted but little notice. The *Société de Médecine* of Paris, a few years ago, instituted a *prize question* in the following

terms:—"to determine the existence of *idiopathic* fever;" implying that, possibly, all fevers might be *symptomatic* and not *primary* affections, as commonly supposed. The affirmative of this was adopted, and ably supported, by one of their most distinguished writers, M. *Broussais*. It is hardly necessary for me to observe, that this is one of the points which I endeavoured to establish many years before, and which made the subject of my *Inaugural Thesis* at the University of Glasgow, in the year 1804, and, subsequently, of the "Inquiry into the Seat and Nature of Fever," first published in the year 1807. M. *Broussais*, however, differs from me in a most material point, namely, in referring the primary seat of fever to the abdomen, instead of the brain, as I had done.

Pyrexia, or symptomatic fever, then, is not, strictly speaking, one of the *varieties* of *idiopathic fever*, but an attendant on all *febrile* disorders, and a mere consequence of inflammation; which it serves, therefore, to denote the presence of in the system.

ON PYREXIA,

OR

SYMPTOMATIC FEVER.

SECTION I.

DESCRIPTION OF PYREXIA, OR SYMPTOMATIC FEVER.

By the term *Symptomatic Fever*, is understood that general disorder of system that is observed to attend a great number of inflammations of different kinds, and wherever seated; and which is more particularly characterized by *heat of skin, frequency of pulse, thirst,* and *foulness of tongue.* By Dr. Cullen, and other modern nosologists, this state has been technically termed *Pyrexia;* while, among ourselves, it is familiarly called *Fever* (in the loose and popular sense in which this word is commonly employed), in allusion to the increased heat of the

body, which is its most obvious and striking character. By that distinguished teacher and writer, the late Dr. George Fordyce* (the co-temporary of Cullen), it was denominated *General Inflammation*, that is, when it arose in habits of strength; but where it took place in weak and irritable subjects, he called it *symptoms of irritation*. And, lastly, in the figurative language of Mr. John Hunter, symptomatic fever is said to be the effect of "the *constitution* sympathizing with the *part*."

This state has never been sufficiently distinguished by medical writers, from what has been called *proper* or *idiopathic* fever; as may be seen by attending to the definitions that have been given of the latter, and which will be generally found to include the characters of *symptomatic fever*, and sometimes to consist exclusively of these. Thus, *Galen* calls fever—"Calor præter naturam, é corde in omne corpus effusus." Boerhaave gives us the following, as the character of *fever* in general:—"Horripitatio, pulsus velox, calor;" and *Linnæus* says,

* *Elements of Medicine*, by George Fordyce, M.D.

"febris dignoscitur pulsu citato." Now, admitting that these characters are to be found in almost every case of *proper* or *idiopathic* fever, it is certain that they equally belong to *symptomatic* fever, or that disorder of system which attends inflammation, wherever seated, when it exists with a certain degree of violence, and to a certain extent. They afford no criterion, therefore, by which the one of these affections can be distinguished from the other.

Dr. Cullen, in his *Methodical Nosology*, thus defines *Pyrexia*:—"post horrorem pulsus frequens, calor major, plures functiones læsæ, *viribus præsertim artuum imminutis*." In this definition, the characters of *proper* or *idiopathic* fever are, as it appears to me, confounded with those of *symptomatic* fever; for the "viribus artuum imminutis," or prostration of muscular strength, is peculiarly characteristic of *proper* or *idiopathic fever*, and is, indeed, one of the signs upon which we can best rely for distinguishing it from the common *febrile* state that belongs to inflammation in general. This character of *proper* or *idiopathic* fever was particularly no-

ticed by *Sauvages;* who observes, in his definition of this disease, that the prostration of strength is always greater than might be expected from the state of the vital power altogether*. And the same remark is made by Dr. George Pearson, in the printed *syllabus* of his lectures on the "Practice of Physic." It is hardly necessary to observe here, how strongly this supports the idea of the *brain* (which is the organ of the *voluntary power*) being the chief seat of disease in *fever*, strictly so called.

I shall proceed now to describe minutely the state termed *Pyrexia*, or *Symptomatic Fever*, as distinguished from what is called *proper* or *idiopathic fever*.

Pyrexia, or *symptomatic fever*, may be divided into *three* stages. In the first of these, the temperature of the body is diminished; whence this has been called the *cold stage* or *cold fit* of fever. In the second stage, on the contrary, the heat of the body is preternaturally increased, often several degrees beyond the natural stand-

* Semper virium prostratione majori, quam a virium vitalium gradu foret expectandum."

ard; and this accordingly has been denominated the *hot stage* or *hot fit*, and is the circumstance that has given name to the disease. In the third stage, the heat subsides again to the natural pitch, and is generally accompanied with more or less of *sweating:* this *third* stage has often been called the *crisis*, or *critical stage*, of the disease. The combination of these *three* stages has been termed a *paroxysm of fever*, especially when it terminates within the space of twenty-four hours.

The three stages now mentioned, constituting altogether, as observed, a *febrile paroxysm*, have been generally considered as applying to *proper* or *idiopathic* fever alone, and have entered largely into the speculations of Dr. Cullen and others, in regard to the nature or *proximate cause*, as it is termed, of this disease. They appear, however, to belong to *pyrexia*, or the *febrile state* in general, and by no means to apply exclusively to the train of symptoms that attend *proper* or *idiopathic* fever; so that by attending merely to the *febrile symptoms* in any case, without, at the same time, inquiring into

local signs, it is hardly possible to determine the actual disease under which the patient is labouring. Heat of skin, frequency of pulse, and a furred tongue, are always, perhaps, to be considered as signs of existing inflammation; but the particular seat of this is commonly to be learned from the *local* signs, which consist in the disordered state of feeling and functions of the organ immediately affected. It is, for example, by observing *pain in the head*, disordered sleep, prostration of muscular strength, and other disturbance in the state of the *sensorial* functions, that we know *proper* or *idiopathic* fever to be present, and not by the heat of skin, furred tongue, or frequency of pulse; for these are common to all inflammations.

I shall proceed now to trace the different symptoms, in the order in which they usually present themselves.

Pyrexia, or the *febrile state*, is commonly, or rather, I believe, invariably, ushered in by more or less of *coldness* and *shivering*. In some instances these are so slight, as scarcely to attract notice, and consist merely in occa-

sional momentary sensations of *chilliness*, felt, in particular, along the course of the spine; or, at most, are accompanied with slight and transient *shiverings*. On other occasions, the coldness is severely felt over all the surface: the skin is pale, and corrugated, like that of a plucked goose (*cutis anserina*); the features appear shrunk and sharp; the lips and nails are either colourless or livid; while the *voluntary muscles* throughout the body are in a state of involuntary tremor. There is, at the same time, a feeling of anxiety and oppression, referred to the region of the heart, attended with frequent sighing; and a considerable degree of torpor or insensibility involves both mind and body.

The *pulse* at the wrist, in the *first* or *cold* stage of *pyrexia*, is always small and feeble; generally frequent; and not seldom irregular also.

These symptoms continue but for a short period, perhaps an hour or two, and then give place to those of the *second* stage, or *hot fit*.

The increase of heat is first perceived in the centre of the body, and proceeds thence to the surface and extremities. The features become again plump, and sometimes even appear swollen in some degree; while the skin altogether resumes its natural colour, or even acquires a florid hue. A more vigorous action of the heart now takes place, and the pulse at the wrist acquires both strength and fulness, often much beyond the degree of health; while it commonly retains its frequency, though in very different degrees. There is also a general sense of tension and uneasiness over the whole body.

The duration of this *second* stage or *hot fit* of *pyrexia* is very various. It may continue for a few hours only; or for several days, or weeks; or even for a much longer period, according to circumstances which will be pointed out hereafter. When such is the case, however, the febrile symptoms never proceed with uniform violence, but, on the contrary, with *exacerbations* and *remissions*; as will be here-

after explained. When *pyrexia* continues for the length of time stated, it is the second stage, or *hot fit*, that is thus protracted.

The *third* stage, or *crisis*, is that where the symptoms are on the decline, and about to go off. This change sometimes take place rapidly, and is then generally accompanied by more or less of *sweating*, or other evacuation. In this case, the evacuation is said to be *critical*, as if it had proved curative to the disease, by carrying something noxious out of the body. But although the sweating, when it does occur, often indicates the decline, not only of the *febrile state*, but sometimes also of the *local* disease which occasioned it, this is by no means invariably the case; for the sweats often continue to be profuse for days together, without any material alleviation of either; as is seen in many *idiopathic* fevers, as well as other inflammations.

The three stages of *pyrexia* above described commonly bear some proportion to one another. When, for example, the first stage, or *cold fit*,

is strongly marked, the succeeding *hot fit* is usually violent, and generally terminates in profuse sweating. The duration of the paroxysm altogether is then commonly short, and rarely exceeds a few hours. This is observable both in ordinary inflammation, and in that variety of *idiopathic fever* which Dr. Cullen calls *Synocha*, and which, from the shortness of its duration in many instances, is sometimes termed *ephemera*, or the fever of a day.

But if the *cold stage* be slight, and its approach so gradual as to be nearly imperceptible, then the *hot fit* which follows is generally observed to be proportionably slight; the *febrile symptoms* altogether are less severe, but their duration is apt to be protracted, perhaps for many days, or even weeks. Of this we have instances in the milder kinds of *idiopathic* fever (*typhus mitior* of Dr. Cullen), as well as in other inflammations. The subsidence of the disease, in these cases, is also more slow, and accompanied usually with less sweating. These differences in the relative state of the three

stages are common to *fever* (strictly so called), and *pyrexia or symptomatic fever*, the result of ordinary inflammation.

Although the symptoms above described are the most obvious and striking of those that take place in *pyrexia* or *symptomatic* fever, and are generally sufficient of themselves to characterize the affection, they are nevertheless accompanied by various others, in greater or less degree, and which it is necessary now to notice.

The change in the appearance of the tongue is one of the most remarkable of these, and the most deserving of attention; because it serves, better than any other single sign, to mark the slightest degrees of *febrile action*. For in numerous instances, where neither the *pulse* is quickened nor the *heat of skin* sensibly increased, the existence of *pyrexia*, or a *febrile state*, is shewn by some or other of the changes in the appearance of the tongue now to be mentioned.

Whenever a *febrile* state of system arises, whatever be the cause, the appearance of the

tongue undergoes a remarkable change. In most cases, its upper surface (and this only), instead of the usual florid colour which belongs to it in health, becomes covered, to a greater or less extent, with an apparent crust, or *fur*, as it is called*, that differs in thickness, colour, and other respects, at different times, so as to afford the most important indications, not merely of the existence of *pyrexia* (and therefore of its cause, *inflammation*), but likewise, in many cases, of the degree and quality of the inflammation, the danger that attends it, and, sometimes, even of the particular seat it occupies in the body.

In slight *febrile* disorders, that are apparently without danger, the fur on the tongue is of small extent, and confined to the middle and back parts of its surface; and it is also generally thin, and light in colour. If the disease be on the increase, the fur on the tongue becomes thicker and more extensive, so as often to cover the whole of its upper surface. It also acquires

* It is not, however, a deposition of foul matter on the tongue, but an alteration of its natural covering, the cuticle.

in such cases a darker hue ; and if the disease is likely to prove fatal, the colour changes to a dark yellow, or brown, and, in certain cases, to absolute blackness. Generally speaking, the drier the tongue is, the more active and violent is the existing inflammation.

On some occasions, as in certain varieties of *idiopathic* fever, there is no observable fur on the tongue; its appearance, nevertheless, is very different from that of health, so as to mark sufficiently the *febrile state*. It becomes in such cases preternaturally red, as if deprived of its cuticle, and resembles raw flesh ; and it is attended with soreness, so as to become painful, when irritating matter of any kind is applied to it.

When the *liver* is affected by inflammation, and the disease is so situated as to interrupt, or even to impede considerably, the passage of the bile into the intestine, the crust on the tongue is of a yellowish or *bilious* appearance, thus indicating the seat of the inflammation. When, again, the cerebral substance is generally or extensively inflamed, as in *simple* fever of the *typhoid kind*, the tongue turns more or less

brown, according to the degree and danger of the disease. Nothing, in fact, is more characteristic of *proper* or *idiopathic* fever, than this brown appearance of the tongue; and when, as frequently happens, *proper fever* (brain affection) arises in the course of *pulmonic* inflammation, or any other, the complication is marked by the change in the appearance of the tongue here mentioned; accompanied by a manifestly disordered state of the *sensorial* functions, in addition to the proper pulmonary symptoms

As a furred tongue is an unequivocal sign of existing *pyrexia,* or *febrile action* (as this again is of inflammation), so its disappearance is a criterion of returning health that is rarely found to disappoint us. And when important organs are suffering from inflammation, a patient can hardly be considered safe, so long as much foulness of the tongue remains; nor ought we, in such circumstances, to relax in our endeavours to give relief.

The crust on the tongue sometimes disappears gradually, and almost imperceptibly ; at other

times, the separation is effected abruptly; the crust cracks and peels off in flakes; presenting a ragged appearance, and often leaving the surface beneath excoriated and sore.

I may remark here, that the indications afforded by this state of the tongue have often been mistaken, and the appearance referred to a wrong source. It has been, and, indeed, still is, a prevailing opinion (though only of late years, since the *stomach* has been looked to as the great focus of disease), that the tongue is, as it were, an *index* to the stomach; and that its appearance is but a counterpart, or type, of that which exists in the latter organ. It seems to be imagined, that where the tongue is foul and coated, a similar condition exists in the stomach, if not throughout the alimentary canal. It has been even thought that, in the case of *aphthæ* or *thrush*, the same white vesicular appearance that is observed in the mouth and fauces, extends, at times, throughout the whole alimentary canal; and this is considered to be proved by a similar appearance being observed at the extremity of the rectum. Of this, how-

ever, there is no proof. The peculiar appearance observed in the mouth and fauces, in cases of *aphthæ*, is an affection of the skin, and of the cuticle covering it: but these structures can hardly be traced beyond the fauces. Inflammation no doubt often exists, in such cases, throughout the mucous membrane of the intestines; as indicated by pain, and soreness, and an abundant and acrid secretion from the inflamed surfaces: but this is very different from the fur on the tongue that accompanies the *febrile state* simply, and which commonly takes place without any corresponding disorder of the stomach or intestinal canal. The tongue, in short, is an *index* to the *sanguiferous system*, the excited and disordered state of which it clearly serves to mark; and not to the *stomach*, as commonly supposed. This is a point of some importance, practically considered. The employment of *purgatives*, and other means directed particularly to the stomach, on the latter supposition, is, doubtless, often highly useful, as tending to relieve inflammation when it really exists, and, by so doing, clears the

tongue; but the objection is, that such treatment is not always adequate to the purpose, and requires the aid of more active remedies, and of *blood-letting* more especially, which cannot always be safely dispensed with.

In addition to the symptoms already mentioned, as accompanying *pyrexia* or *symptomatic fever*, the different *secretions* are observed to be disordered, and that variously; sometimes being in excess, but more frequently diminished, or altogether suppressed.

The secretion of *saliva*, as well as that from the *mucous membranes* of the mouth and fauces, is generally lessened: hence the dryness of those parts, with a desire for liquids. The *secretions* from the rest of the alimentary canal, as well as those of the organs in immediate connexion with it, and which pour their fluids into it, as the *pancreas* and *liver*, are commonly diminished; and thus costiveness is induced. The reverse of this sometimes takes place, and purging is the consequence. Now and then there is but little change observed in the state of these *secretions*.

The *kidneys* appear, in all cases of *pyrexia*, to have their function disturbed; and a corresponding change is observed in the state of the urine. At first, it is scanty and high coloured, and loaded with saline matter, so as to irritate painfully the passages through which it is discharged. As soon, however, as the *febrile action* begins to decline, the urine is secreted in larger quantity, and is less highly coloured; and, though generally transparent when first passed, it becomes turbid as it cools, and gradually deposits a sediment; which is sometimes of a brick-dust colour, *(lateritious)* sometimes of a bran-like *(furfuraceous)* appearance. This deposit takes place more or less perfectly at different times, so as to mark the more or less perfect subsidence of the *febrile action*.

The *urinary secretion*, indeed, is of nearly equal importance with the *tongue* in indicating the state of the general system in cases of inflammation, and merits our particular notice. This was well understood by the older physicians, though of late it has been neglected, in favour of the *hepatic* function; which affords signs,

however, that are far more uncertain and equivocal.

In the *skin*, an unusual degree of dryness commonly takes place at first; and which is partly to be ascribed to diminished *secretion*, partly to the quicker evaporation of the cutaneous exhalation during the *hot fit*. After a time, this dryness of the skin is followed, in most cases, by *sweating*, which is more or less general, as the circulation happens to be either generally or partially increased. It is probable that changes no less striking would be observed in the state of the other *secretions* had we the same ready means of detecting them.

The *absorbing* vessels, as well as the blood-vessels and exhalents, appear to be in a state of increased and disordered action in *pyrexia*: hence the body wastes as the disease proceeds; so that in long-protracted *febrile* disorders of every kind, the greatest emaciation takes place. Other functions are observed to be more or less disordered, during the continuance of *pyrexia*, or the *febrile state*; that of the *stomach*, in particular, is apt to be impaired, and often

wholly suspended; there is neither the usual appetite for food, nor is digestion properly performed: and thus an additional cause of weakness and emaciation is afforded by the interruption given to the supply of the system.

The general *feelings* of the patient are uncomfortable, if not actually painful. The *sleep* is diminished, unsound, and unrefreshing. The muscular strength is always more or less impaired—the natural result of the unequal distribution of the *vital power*, and its too great expenditure in the excessive action that is going on in the whole *vascular* system. The inability for muscular exertion, however, that takes place in ordinary cases of *pyrexia*, or *symptomatic fever*, is very different from that remarkable *prostration of strength* observed in *idiopathic* fever, and which appears to proceed from the oppressed and disordered condition of the *brain*, essential to this disease.

The degree of *pyrexia* or *febrile action* present in any case is not always a sure criterion by which we can judge of the actual degree and danger of the primary disease. In *irritable*

states of the system, as in children particularly, slight inflammations, such as are attended with no danger, and but little inconvenience, will nevertheless often give rise to violent *febrile symptoms*. On the contrary, in torpid and inirritable habits, such as are met with in advanced life, the reverse is commonly observed. The primary *local* disease may, in such cases, be making a rapid progress, so as to endanger life, with but little general arterial excitement.

In certain diseases of great danger the pulse is often found, for a time, to vary but little from the natural state; nor is the temperature of the body materially increased. This is observed occasionally in cases of severe *pneumonia;* and likewise in many *fevers* of the kind usually termed *malignant*. The tongue, however, in these cases, by its thickly-crusted and parched state, and by its dark-brown colour, generally indicates, with sufficient clearness, the impending danger.

From what has been now said it is evident that, although much useful information is to be derived from attention to the general *febrile*

symptoms—that is, from the state of the pulse, heat of skin, and others, they are not in all cases wholly to be relied upon. Thus, we cannot always form a just estimate of the degree, and probable termination, of *idiopathic fever* merely from examining the pulse, or heat of skin, or even the appearance of the tongue, in the early part of the disease; but must look particularly to the way in which the functions of the organ primarily affected, the *brain*, are performed, as shewn by the state of *mind*, of *sensation*, and of the *voluntary power*. And so in regard to other inflammations.

On the other hand, the *febrile symptoms* are often violent where the primary inflammation is slight, and the danger comparatively small. Of this we have frequent instances in *pleurisy*, *acute rheumatism*, and, likewise, in that variety of *idiopathic fever*, termed the *inflammatory (synocha)*; in all of which the heat of skin is great, the pulse full and strong, and the tongue thickly coated; and yet, under proper management, there may be little real danger.

Pyrexia, being always a secondary affection,

is in strict dependence upon the primary disease that originally produced it. If this cease, either spontaneously (as it often does), or be removed by art, the *febrile action* ceases also, or immediately begins to decline. This is the case, whether the primary disease be acute or chronic in its form. Thus, in the *hectic fever* occasioned by *cancer*, or by an incurable disease of a large joint, the *hectic* disappears as soon as the diseased part has been removed by amputation—unless, as is often the case, the febrile symptoms should be kept up by disease in the lungs, or some other organ.

The converse of what has just now been stated is not, however, necessarily true. The febrile symptoms induced by inflammation may either cease spontaneously, or be removed by art, while the original disease (the inflammation) remains; and that in a degree that may ultimately prove fatal by destroying the texture of the part. Of this numerous instances occur in the case of *pneumonia*. The heat of skin, the frequency of pulse, and even the fur on the tongue, may wholly or in a great measure dis-

appear; yet some degree of inflammation may remain behind in the lungs, sufficient to lay the foundation of *pulmonary consumption* at a future though remote period. As a general rule, therefore, we ought not to limit our efforts to the removal of the *pyrexia*, or *febrile state*, but to watch narrowly the *local* symptoms, not resting satisfied till these have disappeared, as well as the general disorder of system. From want of attention to this point, the most fatal chronic maladies often follow as the consequence of imperfectly-cured inflammation.

In the greater number of cases, however, the cessation of the *febrile symptoms* is a proof of the subsidence of the primary affection, the inflammation that caused them.

SECTION II.

OF THE STATE OF THE BLOOD IN PYREXIA.

If, when the body is in a *febrile state*, blood be drawn in a full stream from either an artery or vein, and received into a somewhat deep and narrow vessel, its properties are generally found to be materially changed. It soon exhibits a blueish tint on its surface, and that while it is still fluid. It is longer, too, in undergoing coagulation than in health; and, on becoming solid, the surface, instead of the usual florid hue of health, is covered with a coat or crust, of more or less firmness and transparency, and which is usually termed the *inflammatory crust*. This appears to be owing principally to the slower coagulation above mentioned, in consequence of which the *red particles* have time to subside to the bottom; but in some degree, probably, to a change in the nature of the blood altogether.

Other differences, in regard to the figure of the consolidated mass, and its firmness or tenacity, are observed, according to circumstances to be presently mentioned. Sometimes, for instance, the surface of the *coagulum* is flat and extensive, so as to occupy the whole area of the vessel in which it is lodged. In this case the crust is semi-transparent, and of a gelatinous texture, like half-melted glue. The blood is then said to be *sizy*. This is usually found to be the case in *simple idiopathic fever*, where the prostration of muscular strength is considerable, without any very acute pain in the head, and where there is no sign of inflammation in any other organ than the brain. At other times the *crassamentum* is firm in texture, and contracted into more or less of a globular shape, with a hollow or cup-like appearance of the surface, and often with curled or crimped edges. The inflammatory crust is then observed to be opaque, tough, and yellowish, not unlike *buff* leather. This is found to be the case in long-continued inflammations, and especially of membranous structures. It is particularly

observable also in *pulmonary consumption*, and affords a very ill omen in regard to the result.

The *inflammatory crust* on the blood seldom makes its appearance till the inflammation has existed for, at least, a day or two; and it is commonly the more considerable the longer the disease has subsisted. Accordingly, it is often wanting on the first or even the second bleeding; but is almost sure to appear afterterwards if the disease proceeds. This would seem to shew, that a so-called inflammatory appearance of the blood is not the immediate effect of the *inflammation* itself, but of the *pyrexia*, or *febrile* state of the system which this produces.

The *inflammatory crust* on the blood may be prevented from taking place by trivial circumstances, although the disposition to it really exists. Thus, if the blood flows in a very small stream, or trickles down the arm, or is received into a broad and capacious vessel, so as to expose a large surface to the air, it coagulates so quickly that time is not given for the *red particles* to subside. On this account, blood

drawn by scarification and cupping glasses rarely shews the *inflammatory crust.*

The general inference to be drawn from what has been now stated, in regard to the *inflammatory crust* on the blood, is, that although its appearance is to be considered as evidence of existing *pyrexia*, or *symptomatic fever* (and, therefore, of *inflammation* as the cause of this, as I shall endeavour to shew hereafter), yet the absence of such an appearance of the blood is not a decisive proof of the absence of inflammation—a point that can only be determined by other signs.

SECTION III.

OF THE VARIETIES OF PYREXIA, OR SYMPTOMATIC FEVER.

MANY circumstances tend to vary the character of *pyrexia* or symptomatic fever, and which it is necessary to notice, as a knowledge of them will be found to illustrate the *diagnosis*, as well as to influence the treatment of the primary disease.

When *pyrexia* is protracted beyond the space of a few hours, it is the second or *hot stage* that constitutes the principal part of the affection; and it is in this, therefore, that the varieties are chiefly seen.

1st. *Pyrexia* may exist in all degrees. In the slightest degree, the pulse is but little, if at all, altered from the natural state in any respect; the temperature of the skin is hardly sensibly raised; and the tongue is but thinly covered on its upper surface with a whitish fur

or crust, which is confined to the middle and back parts of it. In the more violent degrees of *pyrexia*, the symptoms altogether are proportionally severe. The pulse becomes much increased in frequency; the heat of the body is greatly augmented; and the tongue is thickly and extensively incrusted. The different functions are likewise all disturbed in a higher degree.

2dly. The habit of body, as regards both strength and irritability, has a considerable influence in modifying the character of *pyrexia*. When this takes place with any degree of violence in vigorous subjects, the pulse becomes full and strong, as well as frequent. The increased frequency, however, is less than in other circumstances, seldom going to more then twenty or thirty beyond the natural range. The heat is universally increased; and there is a feeling of tension and soreness throughout the body. The urine is scanty, hot, high-coloured, and offensive to the smell. The crust on the tongue is thick, white, and dry, and covers its whole upper surface. The blood

when drawn exhibits a large proportion of *crassamentum*, which is firm in its consistence.

In weak and irritable persons, on the other hand (the primary disease being the same), a considerable difference is observed in the character of the febrile symptoms. The pulse acquires greater frequency, rising often to 130 or 140 in a minute. Instead of being full and strong, as in the former case, it is small and weak, being easily stopped by the pressure of the finger. The increase of heat is partial, and confined principally to the central and deeper-seated parts; not extending to the extremities, unless the temperature of these be supported by artificial means. The tongue, though as much furred as in the other case, is more frequently moist than dry. Blood drawn, in these circumstances, has a large proportion of serum; and the *coagulum* is less firm in its texture.

3dly. *Age* has considerable influence in modifying the character of, or rather the tendency to, *pyrexia*. Very slight inflammation, such as would have little or no effect on persons advanced in life, is sufficient to excite a high de-

gree of febrile action in infants. Females resemble infants in this respect. The degree of *pyrexia* present, therefore, as before observed, is not always a test of the actual violence or danger of the inflammation which produces it.

4thly. The character of *pyrexia* is varied also by duration. For the first few days it usually proceeds with much uniformity, or in a continuous form. After this, a considerable abatement of symptoms usually takes place, once, at least, in twenty-four hours, attended with sweating; which is soon again followed by an exacerbation. This is best seen in acute rheumatism; but it appears also in other inflammations, when protracted beyond a week or two.

Pyrexia sometimes continues for several months, being kept up by the continuance of the primary disease; it is then found to undergo a more considerable change of form, assuming a more decidedly *remittent* character. The pulse becomes small, quick as well as frequent, and hard or cord-like to the touch. The heat of skin is partial and unequal, being the

greatest, and most sensibly felt by the patient, in the palms of the hands and soles of the feet: the cheeks, too, are frequently flushed in circumscribed patches. Slight chilly fits occur about noon, and are followed, towards evening, by a hot and parched state of the skin, which continues through a great part of the night, and is attended with much restlessness. Towards morning, profuse sweats break out, generally during sleep, and continue for some hours. The heat and frequency of pulse then decline, and continue moderate during the early part of the day: after which, the same train of symptoms is renewed; and so on, from day to day, though with unequal severity.—I hardly need add, that the variety of *pyrexia* just described constitutes what is termed *hectic fever*, as observed in cases of pulmonary consumption, diseased joints, and many other long-protracted and incurable diseases. It is merely *pyrexia* in a *chronic* form.

5thly. One variety of *pyrexia* is of so peculiar a nature as to demand particular notice; and the more so, as it admits of a peculiar use

of remedies: I mean the regularly-periodical form, as observed in fevers of the *intermitting* kind; (for in this, as in all other cases, the *pyrexia*, or febrile state, appears to be symptomatic of local disease). In this case the paroxysms of febrile action are pretty regular in their times of recurrence, as well as in their duration, which is always considerably within the limit of twenty-four hours. The intervals between the paroxysms are also distinctly marked, as being in a great measure free from *pyrexia;* yet not absolutely so; for the tongue is always observed to be more or less coated, even in the most perfect of the intermissions; while there are often other signs of febrile action being present in a low degree. In this form of *pyrexia*, the three stages, the cold, the hot, and the sweating stage, or *crisis*, are all in general distinctly marked*.

Several varieties have been noticed in the

* The *intermissions* of febrile action are sometimes nearly as regular in some other diseases as in *intermittents*, strictly so called. This is occasionally observed in *phthisis pulmonalis*, which is thus liable to be mistaken for *intermitting fever*.

character of periodical *pyrexia*, or, as it is commonly termed, *intermitting fever*. Thus, in some cases, the accession of febrile symptoms occurs daily; in others, every other day; and in others, again, with an interval of two days: and thus are formed the *quotidian, tertian,* and *quartan* types of *intermitting fever*. Still longer intervals have been noticed; but it is doubtful whether such occur with any regularity. Other diversities in the character of *intermittents* have been observed; but a fitter occasion will offer for their consideration hereafter, when treating of the varieties of *idiopathic* fever.

6thly. The nature of the part or organ primarily affected has a great effect in modifying the character of *pyrexia*: the want of attention to this has led occasionally to a misconception of the nature of some diseases, and sometimes to an improper mode of cure.

When inflammation, for example, arises in a part that possesses but a moderate share of sensibility or irritability, and which is not very strongly or extensively associated by sympathy

with the rest of the system, the *pyrexia* to which it gives rise is simple in its form, and seems to consist in little more than a state of increased action of the heart and general vascular system. The pulse is full and strong, and but moderately quickened; the heat of the body is pretty universally increased; while the other functions are comparatively but little disturbed. Such is the case with the ligamentous structure in ordinary cases of acute rheumatism;—with the *pleura*, when inflamed;—and in inflammation of the *parenchyma* of the liver, and of the cellular texture in general.

But if the part inflamed be an irritable one, or possess a high degree of sensibility; such as the stomach, small intestines, uterus, or skin; then the febrile symptoms are of a different character. The pulse becomes small, hard, frequent, and quick; there is a feeling of great anxiety; *delirium* also is apt to arise; great disorder is observed in the state of all the functions; with general prostration of strength. These peculiarities attend such inflammations, even in the strongest subjects; and the fact is of importance

to be noted, since the apparent debility has often led to the opinion that *bloodletting* is not admissible, where, in fact, it is imperiously called for. The distinction between such temporary depression of strength (the immediate result of the disease), and real constitutional debility, is to be drawn chiefly from the general circumstances of the patient immediately previous to the attack, as well as from the duration of the disease altogether.

The *pyrexia* occasioned by inflammation of the heart has likewise its peculiarities, a knowledge of which assists us in the *diagnosis* of the disease. In this case the irritability of the organ is greatly increased, and its contractions, in consequence, much quickened. The pulse, accordingly, is extremely frequent, and, at the same time, necessarily small and thready. Sometimes it is irregular also; and, occasionally, there is *syncope;* but neither of these takes place so frequently as the definitions usually given of *carditis* would lead one to imagine. I have seen many well-marked cases of the disease, where the pulse, though extremely quick-

ened, was not at all irregular, and where no tendency to *syncope* was observed.

There is one condition of system, occasionally induced by inflammation of the heart, which has been little, if at all, noticed by writers; this is, an entire failure of the pulse at the wrist, yet without that suspension of the functions of the brain that attends ordinary *syncope;* from which it is to be distinguished by the circumstance just mentioned, of the patient retaining a perfect consciousness, and by the severe pain felt in the region of the heart. The tongue is furred, as in other inflammations; the body is pale and cold; the countenance expresses great anxiety and distress. The failure of the pulse here appears to be owing to the strong disposition to contract in the muscular structure of the heart, occasioned by the inflammation, and which seems to induce in it a very near approach to actual spasm. The general circulation still goes on, but in a very imperfect manner; sufficiently, however, to supply the brain with blood, and to enable it to continue its functions,

The treatment of the disease, under such cir-

cumstances, is somewhat embarrassing, from the difficulty there is in abstracting blood where the general circulation is almost at a stand. A remarkable instance of this kind fell under my observation, several years ago, in consultation with my friend, Mr. Pettigrew. The patient was a strong man, between forty and fifty years of age; and accustomed, as a porter in the East India Warehouses, to lift heavy weights. In the course of his labour one day, he complained of pain in the left side of the thorax, and which became gradually so severe as to oblige him to leave his work. When I first saw him in the evening, the pain in the region of the heart was so acute as to make him cry out; the face was pale, his look anxious, and the hands cold. I was surprised, on examination, to find there was no pulse to be felt at the wrist; nor could I distinctly feel the heart beat on applying my hand over it. The tongue was considerably furred.

Upon reflection on the nature of the symptoms, it seemed unlikely that, in such a subject, the disease should be simply spasmodic; while

the state of the tongue appeared to indicate inflammation. I resolved, therefore, to treat it as such. A vein was opened in the arm; but, as might have been expected, little or no blood flowed. *Cupping*, therefore, was resorted to, and with difficulty a few ounces of blood were thus obtained. By this, however, the pain was in some degree relieved, and the pulse became perceptible at the wrist. After an hour or two, a vein was again opened in the arm, and the blood now flowed, though slowly; and when about four ounces were drawn, *syncope* took place. The *bleeding* was repeated several times, at intervals of a few hours, till between thirty and forty ounces of blood, altogether, were drawn. It was observed, that after each bleeding the volume and strength of the pulse were sensibly increased; so that at the end of thirty-six hours, it had recovered its natural state, and the disease was removed. *Blistering* the chest was also employed. It is probable that *opium* would be useful in such a case, both by relieving pain, and lessening the disposition to con-

tract in the heart; and hence it would be disposed to admit a larger quantity of blood into its cavities.

When the *lungs* are extensively and violently inflamed throughout their substance, the character of the attending *pyrexia* is altered in a different way. The swelling of the inflamed parts, by pressing upon the air-cells and the minuter ramifications of the pulmonary artery and veins, at once prevents the free admission of air into the lungs, and impedes the circulation of the blood through them. The blood, therefore, is not sufficiently influenced by the atmosphere, but retains its *venous* character; hence the livid hue of the skin in various parts: it fails also to acquire the *stimulant* properties of arterial blood in the due degree. The heart and vessels, in consequence, are not sufficiently excited; whence the pulse is soft, and easily compressed. The general circulation is feebly carried on; and the animal heat is diminished. The tongue also, in this case, instead of being white on its surface, becomes covered with a fur of a brown colour, of different shades, and

of different thickness, according to the violence and danger of the disease. The blood, when drawn, is dark-coloured, and coagulates loosely. The brain, likewise, suffers from the same cause, stupor taking place in a greater or less degree.

We have here again a practical proof of the necessity of the distinctions pointed out, being attended to. If we were to attend solely to the pulse, or to the general depression of the system, in violent inflammation of the lungs, we should be deterred from the abstraction of blood; yet in hardly any case is this evacuation more necessary, provided it be resorted to at a sufficiently early period,—a point of paramount importance.

But there is no organ, perhaps, which, when inflamed, so greatly modifies the character of the attending *pyrexia*, as the brain; the reason of which is sufficiently obvious. The great influence exerted by this organ over the whole body, enables it, when extensively diseased, to produce universal disorder throughout the system; so as to make it often difficult, amidst

the multiplicity of symptoms, to discover the primary seat of disease.

When, for example, inflammation arises in the cerebral substance (as I have assumed to be the case in all *idiopathic* fevers), not only are the proper or immediate functions of the brain, namely, sensation, voluntary motion, and intellect, more or less disturbed, giving rise to the peculiar or pathognomonic symptoms of *idiopathic* fever; but the general vascular action is likewise deranged, and that variously, according to the particular seat, extent, and violence of the disease in the brain, so as to vary greatly the form and character of the attending *pyrexia.* Thus, in some fevers, the pulse is much quickened; in others, the reverse; while there are some in which it is but little altered from the natural state, even where the disease is of the most formidable nature; so that the pulse is often a very insufficient index of the violence or danger of the disease. There is a quality of the pulse, however, belonging to *idiopathic* fever in general, when of a *simple* nature, which distinguishes this from other diseases; this is,

a thrilling, tremulous, or vibratory state, more easy to be felt than described, and which is attended with peculiar softness. The tongue, instead of perfect whiteness, is of a brownish hue, and the more so in proportion as the disease is of a more formidable description. The *crassamentum* of the blood is flat and extensive on its surface, and covered by a semi-transparent or gelatinous crust (*size*, as it is termed), while its texture is rather loose than firm. These states of the pulse, the tongue, and the blood, are highly characteristic of fever in its simplest form, that is, when it exists uncombined with other inflammations.

The state of the skin, and of the secretions in general, is peculiar in *idiopathic* fever, as well as the other circumstances described above. The heat of the surface is great, and of a peculiarly pungent kind; and very different from what is observed in other diseases. The secretions shew an unusual tendency to decomposition or putrefaction, and which tendency increases as the disease proceeds. This is indicated by the gradual accumulation of black

and offensive sordes about the mouth and teeth, rendering the breath offensive; and by the fœtor of the various discharges.

The form of *pyrexia* now described, as attending proper or *idiopathic* fever, is more frequently unaccompanied by pain in the organ primarily affected, than that which accompanies other inflammations; a circumstance which, as already observed, is to be ascribed in part to the natural insensibility of the brain, and also to the confusion of intellect which disease in this organ is apt to occasion. In many cases of *idiopathic* fever, the pain in the head is considerable at first, but subsides in the course of a few days, and is not afterwards complained of. Hence, the general disorder of system only being seen, the local nature of the disease is readily overlooked.

7thly. When inflammation, from its extent or violence, or from its being seated in a part of great importance to life, begins to threaten a fatal termination, the approach of this is commonly discoverable in the state of the febrile symptoms. The heat of skin continues, but is

partial and irregular; the sweats are profuse and clammy; the pulse becomes more frequent, small, and weak; the fur on the tongue, thicker and darker-coloured; while the general distress of the patient increases. These all take place in addition to the pain and interruption of function of the organ primarily affected.

Again, if the inflammation has terminated, or is about to terminate, in the death of the part (*gangrene*), the symptoms above described are all aggravated in the highest degree. The pulse is extremely hurried, small, and irregular; cold sweats appear on the forehead, and successively in other parts; the tongue turns still darker and drier, and becomes more thickly incrusted; the countenance expresses extreme anxiety, though often no actual pain is complained of; tremors of the voluntary muscles ensue (*subsultus tendinum*); the diaphragm is convulsively affected (*hiccup*); the mind wanders; the urine and fæces are discharged involuntarily; and death soon follows.

SECTION IV.

OF THE CAUSES OF PYREXIA.

THE term *symptomatic fever*, implies that it is to be regarded as a secondary state— a consequence, merely, of some prior affection, that disorders, *by irritation*, the general system, in the manner above described. But it is important to observe, that all kinds of *irritation* have not this effect. It seems, indeed, to be that kind of irritation which *inflammation* produces, that is the chief, if not the sole, cause of *pyrexia* or the febrile state.

Pain simply, however acute, does not give rise to febrile action. Thus the pain attending parturition,—that which is induced by the passing of gall-stones through the ducts,—as well as many other pains of a purely spasmodic kind, —so far from inducing a *febrile* state, often render the pulse slower than in health, and

are attended, for a time, with a diminution of animal heat. But when, as often happens in the cases just alluded to, the pain, from being intermitting or remitting in its character (as it usually is when of a simply spasmodic nature), becomes continued; with increase of heat, and tenderness to the touch in the part affected (signs which always indicate the accession of inflammation), the pulse immediately begins to quicken, and all the other signs of *pyrexia* soon follow.

Local irritations of various kinds, that do not proceed from, nor are accompanied by, inflammation, may give rise to great general disorder throughout the system, especially in the cerebral functions; but without, at the same time, disturbing the sanguiferous system, that is, without inducing *pyrexia*. Thus *epilepsy*, or *convulsions*, as they were called, in infants, are often brought on by disorder of the stomach and bowels, and by the irritation of teething. In like manner, when *tetanus* follows wounds or other injuries, it is generally in cases where the inflammation in the injured part is

very inconsiderable; and, indeed, in many instances of this sort, the spasmodic contractions do not appear till the wound is entirely healed, and when, of course, all inflammation has subsided. In these cases, *pyrexia*, or a febrile state, is not observed.

On the other hand, *inflammation*, when either violent or extensive, has almost invariably the effect of producing *pyrexia*. Nor does this occur only when the great or vital organs are the seat of the inflammation. The same effect follows, where the simplest structures are inflamed to any considerable extent. Thus we find that *ligamentous* inflammation (*gout* and *rheumatism*)—a copious eruption of pimples on the skin, however simple in their nature, and likewise extensive inflammation of the *mucous membrane* lining either the respiratory or alimentary passages,—are each productive of febrile action, and that in proportion to the extent and activity of the inflammation present.

It is clear, therefore, that inflammation is a general and powerful cause of *pyrexia*, since no violent or extensive inflammation takes place

without inducing it. And one is naturally led to conjecture, that it is the chief, if not the sole, cause of *febrile action*. In order to determine this point, however, it is necessary to inquire, whether *pyrexia* is ever met with, distinct from, and unaccompanied by, *inflammation* as its cause.

It cannot be denied, that many instances occur of a *febrile* state of system, in which, for a time at least, the existence of topical inflammation, is by no means obvious. Such cases have been called *general* or *universal* diseases, or diseases of the whole system; as if no part or organ suffered primarily or essentially more than the rest, or was immediately concerned in the production of the *febrile* state. The case of *proper* or *idiopathic fever* has been especially relied upon, in proof. A little consideration, however, will, I think, shew, that this is far from being conclusive on the subject: for, in the first place, it may be observed, that inflammation often exists where it is not suspected. It is by no means uncommon for indubitable traces of pre-existing inflammation to be

met with after death, of which no suspicion was entertained during life; and that even in the most important organs, as the brain and lungs, as well as many others. This may be accounted for on different grounds; as, first, the not distinguishing sufficiently between the *primary* and essential, or *pathognomonic*, symptoms of a disease, and such as are only *secondary*, or of casual occurrence; the latter being often more striking, and more distressing to the patient, than the former; and hence both the seat and nature of the disease are liable to be overlooked. Inflammation of the liver is thus frequently not noticed, from the attention of the patient being directed exclusively to the disordered functions and feelings of the stomach, which, under the convenient name of *dyspepsia*, are considered and treated as the primary disease; often with the effect of aggravating the hepatic inflammation. In like manner, inflammation of the brain, in children more especially, is frequently ushered in by *vomiting;* and is hence considered as an affection of the stomach merely, and treated as such, perhaps by *stimu-*

lants or *opiates*, till the occurrence of more strongly-marked cerebral symptoms denotes the true nature of the disease—a discovery that is sometimes made too late.

Another cause of inflammation being frequently overlooked, is the small share of sensibility possessed by many internal organs, which, on that account, may be actively and even fatally diseased, without being attended with pain sufficient to attract notice. The *liver* and *lungs* both furnish instances of this, but still more the *brain*. This organ, though the source of feeling to other parts, is itself among the most insensible, and its diseases in consequence the most liable to be overlooked. It is not by pain in the head, therefore, that we are enabled to judge of the degree or nature of disease in the brain, but by the disordered state of the cerebral functions. In the most acute instances of *phrenitis*, the disease often proceeds to a fatal termination, without pain in the head being at all complained of. So also, in many cases of *idiopathic* fever, the pain in the head is inconsiderable, and quite dispropor-

tionate to the other symptoms of the disease; or, if the pain in the head be at first severe, it ceases to be complained of in the more advanced stages of the disease. This may be partly ascribed to the disturbed state of the mental function in those cases; but is referrible also, in part, to the natural insensibility of the organ itself.

The case of *idiopathic* fever, therefore, that has been so much relied upon, as shewing that *pyrexia*, or a febrile state of system, may take place without the presence of inflammation, does not appear to furnish conclusive evidence on the point; because, as I have just stated, inflammation may be going on in the brain, although little or no pain be complained of at the time. It is certain, however, from the disturbed state of the *sensorial* functions (admitted to be present in every case of proper or *idiopathic* fever), that active disease of some kind is going on in the brain; and that such affection consists in inflammation, is a matter of fair inference, from the general character of the symptoms, as compared with those in-

duced by other acknowledged inflammations in this part; while this conclusion receives all the support from dissection that could reasonably be looked for, as I have elsewhere endeavoured to shew*.

It has been said, that although it be admitted that *pyrexia*, in a great proportion of instances, appears to be the result of inflammation, yet that cases are not unfrequently met with, where the febrile symptoms precede rather than follow the inflammation, and cannot then, of course, be caused by this. Thus Dr. Cullen, in describing *pneumonia*, observes, "that the disease almost always comes on with a cold stage, and is accompanied with the other symptoms of *pyrexia*." "Sometimes," he adds, "the *pyrexia* is, from the beginning, accompanied with the other (the local) symptoms; but sometimes it is formed for some hours before the pain is felt†." It may be replied to this, that pain is equivocal as a sign of inflammation, which, in this as in the case

* *Inquiry into the Seat and Nature of Fever.*

† *First Lines*, § 326.

before alluded to, may have existed, though not noticed prior to the febrile attack.

A number of other causes not very obviously connected with inflammation give rise to febrile action at times. The use of *mercury*, to a certain extent, is an instance of this; as proved by the heat of skin, quickness of pulse, and furred tongue, as well as the inflammatory crust on the blood, which a long-continued use of this medicine never fails to produce. *Antimony* has also the same effect, after being freely used for several days—a fact that seems to be less generally known. These substances appear to be taken up by absorption, and, being carried into the bloodvessels, probably act on these, so as to excite them into increased action, if not to produce actual inflammation on their internal surfaces. The power of both *mercury* and *antimony* to excite inflammation on external surfaces, is well known; and one can see no reason why they should not produce the same effect on the irritable internal membrane of the heart and bloodvessels.

The states of *pregnancy* and *menstruation*

are often accompanied by clearly-marked febrile symptoms, and the blood drawn in such cases exhibits a buffy coat. The condition of the general system in both these states is, in many respects, analogous with that which inflammation produces; while the uterus itself exhibits signs of inflammation, or, at all events, a near approach to it, in the pain, and heat, and throbbing, and sense of distention in the uterine region, that constantly attend these states in greater or less degree. It would be going too far, perhaps, to say, that pregnancy and menstruation are, at all times, actual states of inflammation; but it is impossible not to see a striking similarity between them. For, besides the symptoms described above, the same increased action and distention of vessels take place, both in pregnancy and menstruation, that belong to inflammation in general; and, to all appearance, with the same final object in view, namely, either the growth of new solids, or the production of new fluids—processes that are always attended by the condition of vessels here mentioned, and which

are equally observed in inflammation, and in the natural states alluded to. Menstruation, in fact, in many females, is a state nothing short of actual uterine inflammation, and calls for an appropriate treatment.

Various causes of excitement to the sanguiferous system, give rise to a state in some respects similar to *pyrexia*. Such, for example, are violent exercise, the hot bath, the use of alcohol, and various stimulating drugs, as *ammonia*, spices, and many others; all of which powerfully excite the heart and arteries, so as to produce increased circulation of the blood, and raise the temperature of the body altogether. It may be questioned, however, whether the state thus induced is really of the nature of *pyrexia;* for it is not attended by that general disturbance of functions, and the coated tongue, that are observed in genuine symptomatic fever. They appear rather to be cases of simple vascular excitement, which soon subsides again; with no other result than a degree of weakness or exhaustion, that naturally follows over-excitement of any kind.

These same causes, however, if carried to great excess, are capable of producing actual inflammation; and real *pyrexia* may then follow. Thus it is that a debauch in eating and drinking is often succeeded, on the following day, by signs of inflammation in the mucous membrane of the œsophagus and stomach (*cardialgia*), accompanied by the ordinary febrile symptoms. In like manner, *alcohol*, in all its forms, as long as it is used moderately only, seems simply to excite the vascular action of the brain; thereby first giving greater activity to the *sensorial* functions, and subsequently, if carried further, inducing that temporary derangement of intellect which we call *intoxication*. But the same *stimulus*, if carried to great excess, is often followed by actual inflammation of the brain, which manifests itself sometimes in the form of *phrenitis*, sometimes of ordinary *idiopathic* fever, and with the usual *pyrexial* symptoms.

SECTION IV.

OF THE NATURE OF PYREXIA, OR SYMPTOMATIC FEVER.

The characters of this affection are most strikingly displayed in the *Sanguiferous System*, the heart and bloodvessels, the condition and actions of which are always observed to be greatly changed, though differently in the different stages. In the first, or *cold stage*, of *pyrexia*, the capillary vessels of the skin are evidently in a state of *constriction*, which prevents the free transmission of blood through them, and must of necessity occasion more or less impediment to the general circulation. This constriction of the capillaries was not inaptly denominated *spasm*, by Dr. Cullen, and was considered by him as forming an essential link in the chain of morbid phenomena of *proper* or *idiopathic* fever. It appears, rather, to be only a part of that general disorder of system which inflammation is

at all times so apt to induce, and by no means to belong peculiarly, or exclusively, to *idiopathic* fever. We find it, accordingly, taking place as a consequence of all violent inflammations; in combination with the *local* symptoms that arise out of the disordered state of *feeling* and of *function* of the organ primarily affected.

The *heart*, during this *cold* stage of *pyrexia*, acts feebly, and often irregularly, as discoverable in the state of the pulse. There is a sense of oppression about the heart, as if the organ were unable to propel the load of blood that is thrown back upon it in consequence of the contraction of the capillaries. This is accompanied by a disposition to *sigh* frequently, giving the appearance of mental distress; and which probably was the occasion of the application of the term *anxiety* to this peculiar feeling, a feeling that is not entirely removed till the circulation is fully restored in the extreme vessels; or, as Dr. Cullen expresses it, 'till the *spasm* of the capillaries is removed.' It is evident, both from the feebleness of the pulse and the diminution of animal heat, that the force of

circulation is greatly impaired during this, the *cold stage* of *pyrexia.*

In the second, or *hot stage,* a very different, and, in most respects, an opposite state of things, prevails. The action of the heart and arteries, which was so much depressed in the *cold fit,* is now increased, even beyond the natural pitch; as evinced by the greater fulness, strength, and frequency of the pulse, and the augmented temperature of the body, together with all the other marks of increased circulation.

When the habit of the patient is strong, the increase of arterial action above noticed, beginning, as it does, in the central parts, is gradually and uniformly extended over the whole body; as is observed in cases of pleurisy and acute rheumatism, and in that variety of *idiopathic fever* that is called *inflammatory (synocha,* of Cullen)—and in various other active inflammations. But, in weak subjects, the increase of vascular action that takes place in the *hot* fit of *pyrexia,* is partial and unequal; the vital power being apparently insufficient for sup-

porting a general increase of action throughout the system. The more distant vessels act feebly; and the extremities, in consequence, are pallid and cold, unless their temperature be preserved by artificial means. The pulse at the wrist, under these circumstances, is commonly frequent, but, at the same time, small and weak.

This increase of vascular action, as observed in the *second* stage of *pyrexia*, the *hot fit*, is of an unnatural or morbid kind, as may be inferred from the altered state of the *secretions* (especially observable in the urine);—from the interrupted process of *nutrition;* and from the disturbance of various other functions as already noticed, as well as from the changes induced on the blood itself. The same increase of action that takes place in the sanguiferous system, seems to exist also in the absorbing vessels; hence the progressive wasting of the body which is observed constantly to follow the continuance of febrile action, from whatever cause it may proceed.

In the third or last stage of *pyrexia* (the

crisis, or termination of the paroxysm), the preternatural excitement of the sanguiferous system begins to decline, and gradually subsides into the natural state; while the absorbents, which, during the second stage, appeared to be acting in excess, cease now to do so, and even fall below their natural degree of action: and hence it is, probably, that *anasarca*, or general dropsy, so often follows the subsidence of the febrile state, when this has been either long-continued or severe.

If the arteries be examined after death, in cases where the febrile action has been violent during life, their lining membrane, as well as that of the heart and larger veins, is found to be highly reddened, so as to resemble the *tunica conjunctiva* of the eye in an inflamed state, and the substance of the vessel altogether is observed to be thickened. This I have repeatedly witnessed in persons dying of pulmonary consumption, when the *hectic fever* has continued violent to the last. In a case of acute rheumatism that terminated fatally, in consequence of what is called *metastasis* to the

brain, the internal surface of the *aorta* was highly reddened. Dr. Frank, of Vienna, observed the same thing in *inflammatory fever;* which form of fever, indeed, he considers as the result of *arteritis.* The appearances now mentioned would seem to justify the application of the term *general inflammation* to *pyrexia,* or symptomatic fever, by Dr. George Fordyce. They may, however, be nothing more than the result of the long-continued violent action of the vessels in such cases; as this must naturally determine a greater flow of blood to them, with the further effect of increasing both their disposition to act, and their power of acting.

The disordered state of the sanguiferous system in *pyrexia,* as described above, by no means constitutes the whole of the affection. The disturbance in the condition of the *brain* is hardly less apparent, than that observable in the organs of circulation. The affection of the brain, indeed, appears to constitute, if not the first, at least one of the most important links in the chain of morbid phenomena that characterize *pyrexia,* or the febrile state.

In the first, or *cold stage*, the affection of this organ is sufficiently obvious from the disordered state of the *sensorial* functions. Thus, a sensation of *cold* is often experienced, while the body is, in fact, preternaturally warm. The *sensibility* of the surface too, is, at times, so much diminished, that the skin has been actually scorched by too near an approach to the fire, without the patient appearing to suffer pain. The *voluntary muscles* also act independently of the will (*rigor* and *tremor*), and the *mental power* is always in some degree impaired.

The actual *pathological* condition of the brain, in this stage of the affection, can only be matter of conjecture. It is evidently a temporary state, and disappears with the paroxysm, or rather with the *cold fit*. From the known sympathy that subsists between the different parts of the *capillary* system, it is probable that the capillaries of the brain are in a state corresponding with those of the surface, that is, in a state of constriction. The pale-

ness and coldness of the face, the shrinking of the features, and the cord-like feeling that is usually complained of within the head in these cases, give countenance to this supposition. Such a state of the extreme vessels of the brain (supposing it to exist), and the conse quent impediment it would necessarily create to the cerebral circulation, seem amply suffi- cient to account for the imperfect and dis- turbed state of the *sensorial* functions, as well as for the diminished energy of the whole system.

In the second stage, or *hot fit*, proofs, equally strong, of increased arterial action are dis- coverable in the brain, as in the rest of the system: witness the flushing and fulness of the face, the heat of head, and the violent and painful throbbing of the arteries, both within and without the skull. This increased arterial action in the brain is attended with more or less of excitement and disorder of the *sensorial* functions. *Sleep* is either deficient or disturbed; and the *sensibility* and *irritability*

of both body and mind are in excess—a state altogether different from that which took place in the former stage.

Such appear to be the principal changes that take place in the system, in the different stages of *pyrexia*. The way in which they are produced by the ordinary cause, *inflammation*, is a matter involved in much obscurity. In regard to the mode of acting of *causes* in general, in the production of disease, little more than conjecture can be offered. The intermediate links that connect together *cause* and *effect*, are rarely submitted to our senses, and have always afforded a fruitful field for speculation and hypothesis. Inquiries of this sort, however, though they seldom lead to certain results, are yet not necessarily devoid of utility. They serve to open new views to the understanding, and suggest new trains of observation and experiment, which, now and then, lead to the discovery of important truths; while they serve, at the same time, to withdraw the mind from too implicit a reliance on received opinions; which, indeed, are often not

less speculative and visionary, than those for which they are unwillingly abandoned.

It will not be possible, I apprehend, to account for the production of *pyrexia* or *symptomatic fever* as a consequence of *inflammation*, without adverting to that most important connecting principle in the animal economy, the existence of which cannot be questioned, although the term by which it is usually expressed (namely, *sympathy*) has, by many, been objected to. It cannot be denied, that different organs influence one another in various ways; so that no considerable change in the condition of one part can take place without affecting others, in greater or less degree. This is, indeed, the proof of the connexion or *sympathy* contended for; and it has not as yet, perhaps, been designated by a more appropriate appellation.

This *sympathy*, or *consent*, as it has been sometimes called, cannot always be accounted for, from any direct communication of nerves between the parts which thus influence one another; nor even from those parts deriving

their nerves from a common origin in the brain: for, in numerous instances of sympathy existing between organs, nothing of this kind can be traced.

The *brain*, nevertheless, appears to be essentially concerned in this connexion. According to the experiments of Dr. Whytt, the motions which proceed from *sympathy*, cease as soon as the brain is rendered unfit for action, or the communication with it interrupted; "because," as he says, "these motions depend upon a perception in that organ from which the nerves proceed, and where alone the cause of their sympathy is to be found*."

He observed, for example, that when the head of an animal was cut off, the stomach itself might be readily excited to increased *peristaltic* motion for a time, by irritating it; but actual *vomiting* could not be made to take place by the most powerful irritation; the sympathy between this organ and the diaphragm and abdominal muscles (the immediate agents in the act of vomiting) being de-

* Whytt's Works, 4to, p. 518.

stroyed. In like manner, in the human subject, in great injuries of the brain, and in many of its diseases, the *iris* does not contract from the impulse of strong light on the *retina*, because the sympathy between these parts no longer exists.

From these and other facts, it would seem that the brain is the great organ of *sympathy*, or medium of communication, between different parts of the body, as it evidently is between *body* and *mind*. And it is probably in this organ (the brain), that the first change takes place when inflammation is about to disorder the general system. The sufficiency of the changes in the state of vascular action and of circulation in the brain, alluded to above, to disturb the general vascular action throughout the system, as observed in the different stages of *pyrexia*, can hardly be questioned, when we advert to the great influence which the brain exerts over the actions of every part, and which is proved by the effect of various injuries and diseases of this organ.

Upon the whole, with regard to the intrinsic

nature and mode of production of *pyrexia*, or *symptomatic* fever, it may, I think, be concluded that *inflammation*, considered as the ordinary remote cause of this affection, acts as a source of irritation to the brain—disturbing its vascular action, and thereby disordering its functions, but differently in the different stages. The change thus taking place in the condition of the brain, influences subsequently, and in a corresponding manner, the whole *sanguiferous system*.

The affection of the brain, in this case, even in the *hot stage*, where the action of the cerebral arteries is manifestly and often violently increased, does not appear to amount to actual inflammation; yet it is readily convertible into this, where either the *cause* (namely, *inflammation*) exists with great intensity; or (which comes to nearly the same thing) where the disposition to inflammation in the brain happens to be unusually strong. When, for example, inflammation takes place with great violence, or to a great extent, in any part of the body; and more especially if it be

seated in parts that are intimately associated with the brain, and which, on that account, exert a proportionately greater influence over it (such as the different *organs of sense*, and very *irritable structures* in general), inflammation in the brain is apt to ensue. In illustration of this, we may refer to *erysipelas* in particular, which, in ordinary and favourable circumstances, is attended only by slight *pyrexia* or *symptomatic fever;* but when it occurs in habits that are predisposed, as it were, to cerebral inflammation, as in persons addicted to the use of *intoxicating* drinks, it is frequently followed by actual inflammation in the brain, and in that way often proves fatal*.

We have an example of a similar kind in *small-pox*. In mild cases of this disease, the pri-

* Those who have once suffered severely from inflammation of the brain, are apt to have the inflammation renewed by the occurrence of even slight disease in other organs. A young lady who, when an infant, was the subject of inflammation in the brain, in the form of *acute hydrocephalus*, was seldom afterwards attacked by *catarrh*, without *delirium*, and other marks of cerebral inflammation, supervening. I have observed the same in many other instances.

mary or *eruptive* fever subsides, either wholly, or in a great measure, upon the appearance of the eruption. If this be trifling, in point of number, the febrile symptoms altogether disappear, and do not recur again; but if the eruption be very abundant, as in the *confluent* kind, the *febrile state* continues, till, at length, the great extent of the inflammation on the skin irritates the brain into actual inflammation; which, under the denomination of the *secondary fever*, often terminates in death.

There appears to be a considerable analogy, in many respects, between a febrile paroxysm, the result of inflammation, and the effects of the *cold bath*. In both, there is constriction of the capillaries, with tremor of the muscles, and smallness and irregularity of the pulse. These are followed, in both cases, by re-action, or a *hot fit*. I know not how otherwise to explain this, than by stating the fact, that most great changes that occur in the system, and especially when they take place suddenly, are, in like manner, ushered in by shivering, or a kind of *cold fit*; and this succeeded by a *hot* one.

This may be observed on the approach of suppuration, and of parturition—on the passing of gall-stones, and the introduction of the catheter.

It seems not unreasonable to believe, that, in all these cases, the series of changes begins in the brain, and consists in constriction of the capillaries there; and that this is followed by a similar constriction of the capillaries generally, throughout the body. This appears the more probable, when it is considered, that the same effect is produced by certain mental emotions, such as terror or disgust; where the change evidently commences in the brain. Another argument in favour of the supposition, that the series of changes here alluded to commences in the brain, may be derived from the fact, that, when this organ is rendered incapable of performing its functions by the use of *narcotics*, the body becomes insensible to the application of *cold*, however intense. And in such cases, there is neither constriction of the capillaries, nor involuntary tremors of the muscles, produced by it.

From all that has been now said, it may be concluded, that very generally, if not universally, *pyrexia*, or a febrile state of system, is the consequence of inflammation ; the existence of which, therefore, it so far serves to prove. The practical inference to be drawn from the admission of this, as a principle, is of no small importance. Knowing that, wherever febrile symptoms appear, inflammation is going on in some part of the body, we endeavour to discover its seat, and which may generally be done, either by inquiring into the feelings of the patient (most inflammations being attended with more or less of pain), or by examining successively the different *functions ;* which inflammation, when present, is sure to disorder, in greater or less degree. The advantage of this is obvious. Our efforts to subdue inflammation are often more successful, when directed to the immediate seat of the disease, than when administered, as it were, at random ; for the treatment is always more or less modified by the nature of the part affected. In many instances, no doubt, inflammation is more bene-

ficially influenced by *general* than by *local* treatment; and often the part is so situated, as to be inaccessible to direct remedies. Still, there is much advantage in being acquainted with the organ primarily affected, in order that attention may be paid to the exercise of its functions. The brain furnishes a good example of this; for in *phrenitis, fever,* or any other active disease of this organ, there is nothing more injurious than the undue exercise of either *sensation, voluntary motion,* or *mind.*

SECTION VI.

OF THE CONSEQUENCES OF PYREXIA.

Pyrexia, by the violent vascular action that attends it, has the effect, like all other excessive actions, of expending too rapidly the vital power, and thus becomes a cause of general weakness to the system. Another never-failing consequence of long-continued febrile action, is general emaciation. This effect is always in proportion to the violence and duration of the febrile symptoms altogether. Thus, in all acute inflammations, accompanied, as they usually are, by much febrile action, the body wastes rapidly. So after ordinary *continued fevers*, of only a few weeks' duration, both the weight and bulk of the body are found to be greatly diminished; and in *hectic fever*, protracted, as it often is, to a period of many months' duration, the emaciation of the body

is at length extreme. This effect, in the cases here adduced, is to be ascribed partly to the general disorder of functions (especially the *nutritive*) by which the regular supply of the body is interrupted; but in part, also, to the increased activity of the *absorbents*, without which it is not conceivable that such a waste of both *solids* and *fluids* should take place.

Pyrexia has likewise a tendency to produce *hæmorrhage;* and, where a predisposition to hæmorrhage already exists, it often has this effect. It is occasionally also followed by *anasarca*, as is observed after ordinary *fevers* of protracted duration; and, indeed, after long continued *febrile action* of any kind. This effect is attributable to a loss of balance between the processes of *exhalation* and *absorption*. Both are probably in excess; but the former predominates.

A still more important consequence of *pyrexia* is its generating a disposition to inflammation throughout the system, and which often shews itself in the most important organs. This is owing, no doubt, to the excited state

of arterial action that makes so prominent a part of this affection. Nothing, for example, is more common in the course of *simple idiopathic fever*, than for a *secondary* inflammation to arise in some part, in addition to that already existing in the brain, which constitutes the essential part of the disease. In *hot* climates, the abdominal *viscera* are most apt to be thus affected; in *cold* ones, those of the chest. In this way, *simple fever* becomes *complicated* in its characters, and the danger is thereby often greatly enhanced. In *intermittents* of long continuance, the frequent recurrence of the *febrile paroxysms* seldom fails to give rise to *obstructions*, as they are termed—that is, to *chronic inflammation*—in some of the *viscera*, particularly in the *liver* and *spleen;* but occasionally also in the *lungs*. Such combinations always render the treatment more difficult.

In like manner, in *acute rheumatism*, a disease in which the febrile symptoms run higher than in any other disease, the disposition to inflammation thus generated throughout the system is proportionally strong; the *brain*, or *lungs*, or

heart, becoming thus affected, a quickly fatal termination is frequently the result. *Chronic* diseases of the heart, also, attended with disorganization in various degrees, and clearly the result of continued inflammation, are traceable, in numerous instances, to *acute rheumatism*, as their source.

In various other long-protracted and incurable diseases, that are accompanied with *chronic pyrexia*, or *hectic fever*—such as *cancer*, diseased joints, and others — slow inflammation often arises in the lungs, and creeps on, almost imperceptibly; producing disorganization (*tubercles*), and ending in fatal *pulmonary consumption;* which is, indeed, the immediate cause of death in most of these cases.

Phthisis pulmonalis itself, when a primary affection, and attended, as it generally is, by long-continued febrile action (*hectic fever*), seldom fails to be accompanied, towards the close of the disease, by inflammation of the mucous membrane lining the alimentary canal; at first, in the form of *diarrhœa*, and, at last, of *aphthæ*, or *thrush*, in the mouth and fauces.

Frequently, also, *boils* appear on the skin; and (if we may judge from the *delirium* that often occurs towards the close of life, in consumptive patients) the brain itself appears to suffer inflammation in a slight degree.

The dependence of all these secondary inflammations on *pyrexia*, as their cause, appears from hence, that they are always the more conspicuous, the more active the febrile symptoms are observed to be.

SECTION VII.

OF THE TREATMENT OF PYREXIA OR SYMPTOMATIC FEVER IN GENERAL.

In considering diseases that are attended by a multiplicity of symptoms, varying in the time and order of their occurrence, it is necessary to distinguish those symptoms that are primary and essential (*pathognomonic* symptoms, as they are called) from such as are termed *secondary* (as arising out of the former); and likewise from such as are accidental, or of occasional occurrence only. These distinctions are of importance as respects *diagnosis;* but they are still more so in regard to practice. The relief of the secondary or accidental symptoms of a disease is seldom more than palliative; and it not unfrequently happens, that the means employed for the purpose of alleviating particular symptoms, are adverse to the primary disease. Of

this it were easy to adduce numerous examples. For instance, the giving *opium* merely to relieve pain, or to procure sleep, in cases where the pain and watchfulness are the result of active inflammation—the suddenly checking *diarrhœa* occurring in the course of fever, by *opiates* and *astringents*;—and the suppressing a cough, in recent catarrhal or pulmonic inflammation, by similar means, where a free expectoration is, perhaps, the thing needed;—in all these cases, the primary disease is often aggravated by such merely palliative measures.

These remarks apply to *pyrexia*, which is always a secondary affection, as before shewn. In this case, however, as in others, there are numerous occasions in which secondary symptoms require to be attended to, and even demand our principal attention in practice. In the first place, because they are sometimes more painful, and more dangerous in their consequences, than the primary disease itself; and next, because, in many cases, we can only influence the primary disease through the medium of the secondary symptoms. To under-

stand this, it is necessary to advert to the influence which *pyrexia* is capable of exerting on the primary disease.

Pyrexia sometimes appears to re-act on the primary disease, so as to increase its violence. This may be observed in the case of *acute rheumatism*, as well as other active inflammations, when they occur in vigorous subjects: the local pains are generally in proportion to the severity of the febrile symptoms; these, therefore, it often becomes necessary to moderate. But in slight and recent cases of inflammation taking place in weak and delicate subjects, the occurrence of *pyrexia* sometimes appears to conduce to the removal of the primary disease, and should, therefore, be rather encouraged than suppressed. I may cite the following as examples of this:—

Instances occur, almost daily, of slight inflammations, occasioned by *cold*, (as catarrh, sore-throat, rheumatism, &c.) being successfully treated by *stimulants* of an active kind, under the denomination of *diaphoretics* or *sudorifics*; such as *camphor*, *ammonia*, the *hot*

bath, and various others. These, by exciting the sanguiferous system, rather tend, at first, to produce or aggravate the febrile state; but if they be so managed as to induce sweating, the febrile symptoms often subside, and, at the same time, the primary inflammation which caused them. This mode of practice, however, is rather equivocal in its effects, and requires caution; for where it does not succeed in removing the primary inflammation, it is sometimes found to aggravate it. Whenever, therefore, the inflammation is seated in organs of importance to life, and which it is desirable to suppress quickly, it is hardly advisable to proceed in this way. The *sudorific* practice, however, is rendered more safe in such cases, and, at the same time, more effectual, by previous abstraction of blood, in proportion to the habit of the patient, and other circumstances.

In ordinary *continued fevers*, of a mild description, this mode of treatment (the *diaphoretic* or *sudorific*) has been, and, indeed, still is, in very general use, in preference to the more active, though unquestionably more effective,

means of cure, by *blood-letting*. The ground of preference here seems to have been the preservation of the general strength. This object, however, is more frequently frustrated than promoted by such practice. This mode of treating fever fails to have the desired effect (that of speedily putting a stop to the disease) in the greater number of instances; and the result then usually is, a long-protracted disease, with great exhaustion of the vital power, and general emaciation; with the further risk of lasting if not fatal injury being done to the structure of the organ primarily affected, by the long continuance of inflammation in the part. It is almost invariably found, in cases of *fever*, that the lost strength is more rapidly recruited, and the cure far more complete, when the disease is treated actively in the beginning (as by *blood-letting* and other simple *antiphlogistic* means), than when the fever is allowed to run its ordinary course, under the use of what are mis-called milder means, but which, in the end, are infinitely more distressing to the patient. It must be borne in mind, however, that *blood-*

letting is limited almost entirely to the earliest stage of the disease; for when a fever has gone on uninterruptedly for several days, it is seldom within the power of art to arrest its progress. The disease must then be allowed to pursue its course (the object being merely to palliate particular symptoms), till it arrives at its natural termination. As this termination approaches, and when the violence of arterial action has considerably subsided, as judged of by the pulse, the moderate employment of stimulants, in the form of wine, &c., is attended with real advantage.

In violent or *malignant* fevers, as they are called, which are now happily of rare occurrence, it was formerly the practice to induce profuse sweating, by the use of the most active *stimulants*, such as combinations of *alcohol*, *spices*, *camphor*, *ammonia*, and others. Instead of the cool and simple regimen now in general use, and upon which the comparative mildness of *fever* at present chiefly turns, the patient was made to breathe a heated, and

generally an impure, atmosphere, which, with the stimulant remedies abovementioned, actually produced the so-called train of *typhoid* or *malignant* symptoms they were designed to obviate. Sydenham himself was led, in many instances, to adopt the *sudorific* practice in the treatment of *fever;* not, however, from considering it the most useful, but because, as he says, he found it often difficult, from the prejudices of the age, to carry blood-letting (which he found to be by far the most useful and effective) to the required extent; and, unless this were done, the remedy appeared to be rather injurious than beneficial. The stimulant or *sudorific* practice above alluded to, must, doubtless, have succeeded in many instances, or it would not so long have maintained its ground, as was actually the case. It is certain, however, that the motive for employing it—that of carrying noxious matters out of the system—was altogether hypothetical and inconsistent with sound pathology; and it is not less certain, that the success attending the practice was far

from being such as to make it an object deserving of our imitation.

In fevers of the *intermitting* kind *(agues)*, before the introduction of the *cinchona* or *Peruvian bark*, it was the general practice to excite the sanguiferous system during the paroxysm by the most powerful *stimulants*, in other words, to increase the febrile action. By the exhibition of such remedies, and the profuse sweating that usually followed, a more perfect *crisis* was sometimes obtained, and the further recurrence of the paroxysms prevented. This mode of treating *intermittents* is now rarely practised, a preference being justly given to the *cinchona*, and remedies of the same description; the former, the *stimulant* plan, being always uncertain in its effect, and, when it fails to cure, calculated rather to aggravate the disease: *intermittents* being thus often converted into *continued* fevers; while *continued* fevers are rendered more dangerous by every unsuccessful attempt of this sort.

The *specific* or *eruptive* fevers, especially *small-pox*, were for a long time treated in the

same manner, but with the worst possible effect; and the practice is now very properly abandoned. In the very advanced stage of these, as of other *fevers*, as well as of inflammation in general, when the vascular action is failing, as shewn by feebleness of the pulse, one feels a propensity that seems natural, to resort to wine and other *stimulants*; and if they are used with great moderation, they really appear to be beneficial—not acting, however, upon the principle of *supporting the system* (a mode of expression that appears to me to involve an absurdity), but, by a kind of *counter-irritation*, relieving the *local* disease by exciting a more general action throughout the system, and thus equalizing the distribution of the *vital power*.

With the exceptions now mentioned, it is generally proper to endeavour to subdue, or at least to mitigate, *pyrexia*, or the *febrile symptoms* that attend inflammation; although the doing so may have no material influence over the primary disease.

In violent inflammations in general, wherever seated, and especially if the patient be of a

vigorous or inflammatory habit, and the disease recent; attended, too, as it commonly is under such circumstances, by high *febrile* action, it is essential to endeavour to subdue this by the most active means; not only for the purpose of guarding against the consequences formerly mentioned, but also as the best means of influencing the primary disease itself: for in the most important inflammations, the part primarily affected is out of the reach of direct or topical remedies. And even where it is accessible, experience shews that local treatment is often less efficacious than the use of general remedies. Accordingly, it is found that the reduction of the *febrile action*, by *blood-letting* and other *antiphlogistic* means, proves the first, and often indeed the only, step requisite to the cure; the primary disease giving way immediately that this object is attained. It is, however, important to repeat here, that this is not universally the case; for the *febrile symptoms* may wholly disappear, while the primary inflammation still continues, though, perhaps, in a mitigated form. Our care, therefore, is not to be limited merely

to the removal of the *febrile symptoms* in inflammations of important organs, such as the brain or lungs, but should be continued till the *local* signs, as well as the general disorder of system, have wholly disappeared. The neglect of this, as a rule of practice, often leads to fatal mischief at a remote period afterwards; as in *pneumonia* more especially, where, if the slightest degree of inflammation be allowed to remain in the lungs, it is likely to produce disorganization, the ultimate result of which often is, *pulmonary consumption.*

In *hectic fever (chronic pyrexia)*, attending ulceration, or other change of structure, in the lungs, the reduction of the *febrile* symptoms appears to be the chief, if not the sole, means of arresting the progress of the disease: for I scarcely need observe, that all the boasted *specifics* that are daily and confidently obtruded on public notice as cures for consumption, are wholly undeserving of attention, their utility being disproved by abundant and fatal experience. By acting upon the simple principle of lessening *febrile action,* we do all the good that

the case admits of. We relieve the most distressing symptoms of the disease; and, by so doing, prolong life. And further, should a cure be attainable (which undoubtedly is sometimes the case), it is only to be accomplished, as far as I have observed, by acting upon the same principle.

In ordinary *fevers* of a mild description, when the time for active treatment is past, so that no reasonable expectation can be entertained of interrupting at once the further progress of the disease, a favourable termination mainly depends upon keeping the *febrile* symptoms within moderate bounds. For such a purpose, however, the mildest *antiphlogistic* treatment only is required; such as the admission of cool and fresh air, cooling drinks, and mild aperients from time to time. The neglect of these, and the substitution of *stimulant* means (upon the absurd plea of *supporting the strength*), is a frequent cause of the disease assuming what is called a *typhoid* form in its latter stages.

In *small-pox*, and in the *specific* fevers in general (for which we can hardly be said to

possess any absolute remedy), our chief attention should be directed, and, indeed, is limited, to the single purpose of moderating the *febrile symptoms;* by doing which, the danger is in a great degree obviated, while the disease passes mildly and quietly through its course.

SECTION VIII.

OF THE PARTICULAR MEANS APPLICABLE TO THE RELIEF OF PYREXIA.

Increased heat being the most obvious, as well as one of the most constant of the symptoms termed *febrile*, the reduction of this becomes a principal object of attention in practice. The different means applicable to the purpose have been termed *cooling*, *refrigerant*, or *antiphlogistic*—all terms of similar import. They have been also called *sedatives*, as allaying vascular action, upon the excess of which a morbid evolution of heat in animal bodies chiefly depends.

The means are various, and adapted to different circumstances. They consist principally of the following, and may be thus arranged, according to their degree of efficiency. 1. *blood-letting*; 2. other *evacuants*, as *purgatives*, *emetics*, *sudorifics*, and *blisters* (all

of which, however, are far from acting on the same principle); 3. *Fox-glove*, and perhaps others of the *narcotic* tribe; 4. preparations of *lead;* 5. *cold*, applied in various ways; and, 6thly, *acids* and different *neutral* salts.

1. Of *blood-letting*, as a remedy for *pyrexia.*

In the employment of this potent remedy it is not only necessary to consider its power of subduing febrile action simply, but also the influence it may exert over the primary disease. Nor must the condition of the general system at the time be overlooked. Without a due consideration of all these points, indeed, the remedy can neither be properly nor even safely resorted to.

For the simple purpose of mitigating or subduing febrile action, blood-letting is only called for where that action is in great excess, so as to become of itself either directly or indirectly a source of danger. When used with such an object, it requires only to be carried to a moderate extent; as from eight or ten to perhaps sixteen ounces, according to the age, habit, and other circumstances of the patient.

In the case of violent and recent inflammation, occurring in vigorous subjects, accompanied, as such cases almost necessarily are, by a high state of febrile action, bloodletting cannot safely be dispensed with, and particularly when organs important to life are concerned.

A very general aversion from bloodletting, however, appears to prevail, when the patient is weak, even although considerable *pyrexia* should be present, as is often the case. This objection, according to my observation, is not in general well founded. A febrile state of body argues the existence of inflammation, equally in the weak as in the strong. The intrinsic nature of the disease is the same, and the treatment is governed by the same general principles. It is only necessary that the remedy should be properly adjusted to the existing circumstances; and, with this limitation, bloodletting will be found both as safe, and as effectual, in the one case as in the other.

The case of *hectic fever*, as occurring in *pulmonary consumption*, serves to illustrate what has now been said. In the confirmed state of

this disease, a cure is rarely to be expected from this or any other means. Yet much may be done to mitigate the violence of febrile action (the *hectic*); by doing which, much suffering is spared to the patient, and life often prolonged to a considerable extent. These important objects may be accomplished in many instances by bloodletting, repeated from time to time, but always in small quantities, as from three or four to five or six ounces at a time; the rule being, in such cases, so to draw blood, as not sensibly to disturb the functions or feelings of the patient. When used with these precautions, and while a tolerable share of general strength still remains, the good effects of small and repeated bleedings are often strikingly displayed, by their relieving all the most distressing feelings of the patient, inducing quiet sleep, and restoring appetite if lost. And I may further add, that if the disease admits of a cure, as undoubtedly is sometimes though rarely the case, it is most likely to be accomplished by such means; and this I have seen in different instances. I consider it, how-

ever, to be essential to the success of this mode of treating *pulmonary consumption*, whether undertaken with a palliative or curative intention, that the patient should be allowed to take food, either animal or vegetable, as his habits and inclinations may lead him. And it is no small recommendation of this practice, that not only is appetite usually excited by such small bleedings, but animal food may then be taken without producing that feverish excitement that it is otherwise apt to do

Venesection is greatly preferable to other modes of drawing blood for the relief of *pyrexia;* because this being an affection of the sanguiferous system chiefly, is most influenced by that mode of taking away blood that has the speediest and most general influence over the circulation.

I before observed, that, in the employment of bloodletting as a remedy for *pyrexia*, it is not only necessary to consider its power of subduing febrile action, but also to take into account the nature and circumstances of the primary inflammation, for this is not always,

nor necessarily, benefited by that remedy. Many inflammations have a strong natural tendency to subside spontaneously, after running through a certain course. The most frequent example of this is furnished by inflammation of the *mucous membrane*, whether of the respiratory or alimentary passages, or any other. The natural tendency of inflammation in this structure is, to terminate in an increased secretion of mucus, and which, after a while, gradually declines, leaving the structure and functions of the part unchanged. Now bloodletting in these cases, if it be carried so far as to weaken considerably the general system, or to disorder materially its functions, disturbs the natural course of the disease, so as often to prolong its duration, and render the cure more difficult. It is only, therefore, where the febrile symptoms run unusually high in such cases, that bloodletting is required for their mitigation.

I may observe here, however, that there is no foundation for a notion that has prevailed of late (and only of late), namely, that there

is something so peculiarly depressing in the nature of inflammation, when seated in the *mucous membrane*, as to preclude the use of bloodletting altogether. Instead of this being the case, I venture to assert that, when called for by the severity of the symptoms, bloodletting is as useful, and indeed as necessary, in the treatment of *catarrh, diarrhœa*, and other inflammations of the *mucous membrane* (provided they be recent), as in that of any other structure.

Various others of the class of *evacuants* are powerful in diminishing *pyrexia* or febrile action, though, generally speaking, they act upon a very different principle from that of carrying matters out of the system. They seem rather to act upon the principle of *counter-irritation;* as, indeed, bloodletting itself probably does in a great measure. And, upon the same principle, they not only tend to relieve *pyrexia*, as the effect of inflammation, but often, also, the inflammation itself.

Formerly, *sudorifics* were most relied upon, and were universally resorted to, in febrile dis-

orders of all kinds; and, doubtless, very often with good effect. The comparative advantages and disadvantages of this practice have been already pointed out.

Emetics are powerful in breaking the chain of morbid phenomena that constitute the *febrile state;* and, in so doing, they certainly act, for the most part, upon the principle of *counter-irritation.* Exhibited at the outset of ordinary *idiopathic* fever, and repeated for several times, at intervals of a few hours, I have often observed them to interrupt the perfect formation of the disease, so as to bring it to a speedy termination. *Emetics* have been used likewise with advantage in *intermittents;* as, doubtless, they might be for the relief of various other *febrile* disorders.

Much has been said and written of late in favour of the employment of large doses of the *tartarized antimony;* not, however, on account of its *emetic* properties, nor as a *sudorific;* but as a direct *sedative,* for lessening febrile and inflammatory action. The earliest account of this practice that has come under my observa-

tion is contained in a work on the "*Petechial Fever of Geneva,*" as it occurred in the years 1808 and 1809; published at Milan, by Dr. *G. Rasori*, and noticed in the *Medical and Physical Journal*, for February 1820. Dr. *R.* is an advocate for the inflammatory nature of fever in general, even including the *petechial* variety; and he advises the use of *antiphlogistic* remedies accordingly. The chief of those which were successfully employed by him in the fever in question, were *antimonials* and *saline purgatives*, especially the *supertartrate of potass.* He considers *antimony* as a direct *sedative*, or *counter-stimulant;* independent of any evacuation, or other sensible operation. *Opium*, wine, and all the other usual *stimulants*, were found to be hurtful, even when what are called *nervous* symptoms occurred, as *subsultus tendinum*, and the like.

The practice of giving the *tartarized antimony* in large doses, has, as usual, found imitators in this country; and some have even gone so far as to assert, that it is an adequate substitute for bloodletting in the treatment of

inflammation in general. Judging, however, from my own experience on the subject, after numerous trials; aware also of the fallaciousness of what is generally called experience in physic, I confess I am inclined to be sceptical with regard to this, as well as various other points, that appear to be taken for granted by some in the present day. The credulity displayed of late by the public, and indeed by many members of the medical profession, regarding the supposed efficacy of the *Hahnemanic* or *homeopathic* practice, is well calculated to lessen one's confidence in all such extraordinary statements.

Purgatives have been in great vogue, of late years, as *anti-febrile* remedies; while *emetics* have been comparatively neglected. In the preference given to the one or the other of these, however, whim or fashion, probably, rather than any well-grounded experience, has determined the choice; for in medicine, as in most other affairs of life, fashion has a paramount influence.

Among the remedies calculated to subdue

febrile action, the *foxglove* (*digitalis purpurea*) merits particular notice. This plant has a surprising, it might, indeed, be said, a *specific*, power, of lessening the frequency of the pulse; thereby diminishing animal heat; and thus febrile action is relieved. This remedy is an important auxiliary to bloodletting in febrile disorders in general; and is likewise applicable in many cases, where the latter is objectionable, on account of its debilitating effect. The action of the *digitalis* is, for the most part, temporary, and of short duration; while it does not diminish the vital power, as bloodletting necessarily does when carried to any considerable length. It is as a *sedative* in the *hectic fever* that attends pulmonary consumption, however, that the value of this drug is the most strikingly displayed. It commonly diminishes, and sometimes subdues altogether, the febrile symptoms. Under its beneficial operation the night-sweats disappear, the sleep becomes calm and refreshing, and the appetite is restored. The progress of the disease towards its usual fatal termination is often arrested for a time; and, more

than this, a cure is sometimes thus effected, especially when the circumstances admit of its being used in combination with small and repeated *bleedings*, as already mentioned. A great drawback from the usefulness of the *foxglove* is, the uncertainty as well as the occasional violence of its action. It will not at all times, however administered, reduce the frequency of the pulse; and when this is the case, it fails to produce its beneficial effects.

Opium, by its influence on the brain, sometimes lessens the irritability of the heart, so as to render its action slower, and that even in cases where the *digitalis* fails to have this effect. By so doing, it may lessen *febrile action*. Its effect in this way, however, is uncertain and equivocal. It is only in cases of great irritability of the system altogether, where the pulse is exceedingly frequent, and does not become slower by bloodletting or the *digitalis*, that *opium*, as a *sedative*, appears to be admissible. In the generality of cases of inflammation, *opium* is found to aggravate rather than diminish *febrile action*; and it has the further effect of

checking the secretions, upon the freedom of which the cure often depends. *Opium* has also the disadvantage of masking the symptoms, by rendering the patient insensible to pain for a time, and which it may do without at all relieving the primary disease. Whether the other *narcotics* have the effect of lessening *febrile action*, I am not prepared to state. *Tobacco*, however, appears to exert a *sedative* influence over the sanguiferous system, and might, perhaps, be usefully employed for such a purpose.

It was remarked by Dr. Whytt*, that *Wine*, and even *Brandy*, under certain circumstances, act as *sedatives* to the sanguiferous system, cooling the body when preternaturally heated. This effect is to be ascribed, probably, to the action of these substances on the *brain*; diminishing, like opium, the irritability of the whole system, and of the heart and bloodvessels in particular: whence the pulse becoming less frequent, a diminished evolution of animal heat is the result. We have a good example of what is now stated in the latter stages of *fever*; in

* Whytt's Works, 4to, p. 647.

which a moderate quantity of wine is often found to lessen the frequency of the pulse, and, at the same time, to increase its strength and fulness.

The preparations of *lead* have undoubtedly a powerfully *sedative* influence over the sanguiferous system, so as, on many occasions, to lessen *febrile action*. The *saccharum saturni (plumbi acetas)*, the only one in use, has frequently been employed for the purpose of diminishing the night-sweats in pulmonary consumption; and it was even supposed capable of curing the disease altogether. Accordingly, a solution of this substance was long kept in the shops, under the name of the *anti-phthisical tincture*. The known deleterious properties of this metal, however, have prevented its general employment. It may nevertheless be both usefully and safely employed (where other means fail) for the relief of *hectic fever;* but it should be used with much caution, and for a limited time only. It has been occasionally, though rarely, used in ordinary *continued fever;* with what effect I am not qualified to speak.

It is customary to employ *acids*, and likewise some of the *neutral salts*, as *refrigerant* or *anti-febrile* remedies; such as common nitre, the acetate of ammonia, and the citrate of potass (the common saline draught). These serve well enough to amuse patients, and fill up the routine of ordinary practice; but they are of little real efficacy.

Cold, properly applied, is a real *sedative*, and powerful in allaying *febrile action*. In ordinary *fevers*, it serves to mitigate the symptoms altogether, and contributes much towards a favourable termination of the disease. In fevers of the *specific kind*, especially the *small-pox*, it is of still greater importance, and conduces, more than any other circumstance, perhaps, to the safety of the patient. In all cases, where *cold* is resorted to for the purpose of moderating *febrile action*, it should be applied steadily, and so as to occasion as little disturbance as possible in the system. The admission of *cool air* to the surface—*cold drinks*—and occasionally spunging of the body, either partially or generally, with *cold* or even *tepid* water, is, in general, all that is required.

It seems scarcely necessary to observe, that the regimen of the patient should correspond with the medical treatment in cases of *pyrexia*. On many occasions, the regulation of the food and drink, air, exercise, &c., constitutes all that is essential. Numerous instances are on record of chronic inflammations, when accompanied with a febrile state of body, yielding to long-continued abstinence, and that where a more active treatment has failed. *Pulmonary consumption* appears to have given way, in many instances, to perseverance in a milk and vegetable diet; and I think I have seen *cancer* arrested in its course, or, at all events, greatly mitigated in its symptoms, by the adoption of a vegetable diet, as suggested by Dr. Lambe.

Increased circulation constituting an essential part of the character of *pyrexia*, it is generally proper to abstain from much bodily exercise, from the tendency it has to increase the action of the sanguiferous system.

Since the foregoing pages were written, my attention has been called to a work, recently published, under the title of "The Elements of Medicine," by Drs. Bright and Addison, Physicians to Guy's Hospital—a work that cannot fail to be read with much interest, as well on account of the simple and unostentatious style in which it is composed, as from the abundant proof it affords of the great practical knowledge of the writers, which has qualified them, in no ordinary degree, for the task they have undertaken.

The subject of *fever* naturally engages a considerable share of their attention; and I have been much gratified at finding no small degree of similarity in our opinions regarding it. I by no means intend to say, that these gentlemen go the length of adopting, in direct terms, and to the fullest extent, the principles I have advocated; yet a remarkable coincidence will not fail, I think, to be observed; as may be seen by comparing together the conclusions we have respectively arrived at, and the facts from which they are deduced.

The theory of fever which I have endeavoured to maintain embraces two distinct points, which require to be separately considered—the *seat* and the *nature* of the disease.

My first position is, that *fever*, strictly so called, or *idiopathic fever*, as it is more commonly termed, is not a *general* but a *local* disease, the seat of which is the brain or *encephalon*—and, judging from the great diversity of the symptoms, the disease would appear to occupy the entire organ; though unequally, and differently at different times and in different individuals. Hence it is, that certain of the *sensorial functions* are sometimes more disturbed than others, though all are so in greater or less degree. In one individual, for example, there is observed an intolerance of *light*—in another, of *sound;* and so of the other external senses. In some, the *voluntary power* is more depressed than in others. In some, there is early *delirium;* while in others, the *mental power* is simply impaired.

The same inequality may be observed in regard to the *secondary* functions of the brain

(if the expression may be allowed)—I mean, those functions, the organs of which are remotely situated, and which, though deriving much of their energy directly from the brain, and therefore liable to be disordered by it, are yet, to a certain extent, independent of it: it will be sufficient to mention here the *stomach* and *sanguiferous system*, which belong rather to the ganglionic or organic, than to the cerebro-spinal or animal nervous system. Thus, it is found that, although the functions of the stomach are always impaired, and, indeed, for the most part suspended, in fever, there is great difference observed in regard to the extent to which this organ is disturbed at different times. On some occasions, *vomiting* forms a prominent character of the disease, while it is not met with at all in others. So in most fevers, the action of the heart is much quickened, as shewn by the pulse; in some, however, the reverse takes place, the pulse becoming preternaturally slow: and there are not a few in which the pulse is little altered from the natural state. In some peculiar instances of fever, the capil-

lary extremities of the arterial system appear to be in nearly a paralyzed state; losing their contractility, and allowing the blood to escape into the interstices of the skin, and from the different surfaces and excretories—the *malignant* and *spotted* fevers, so called.

The disorder of the cerebral or sensorial functions above described, and which is so constantly observed in cases of proper or idiopathic fever, constitute, in fact, the *pathognomonic* or distinguishing character of the disease; for the mere *febrile* symptoms—the hot skin, furred tongue, and accelerated pulse are common to all inflammations, and indicate nothing in regard to the particular seat of the disease.

Now, if we compare with this the description of fever in general, as given by the authors of the "Elements of Medicine*," they will be found to be essentially alike; differing little more than in terms, and in regard to the part in which the symptoms are supposed to originate; the seat of disease in the one case being referred

* Elements of Medicine, p. 5.

to the brain exclusively, while in the other it is referred to the *nervous system* altogether.

1st. "In every case of fever," the authors observe, "the causes producing it inflict a morbid impression upon the *nervous system*, by which the functions of that system, intellectual and bodily, are deranged, that derangement differing in degree in different cases: and in consequence of this derangement, every organ, and every function of the body, appears to be more or less disordered."

2dly. "In every idiopathic fever, this morbid condition of the *nervous system* is associated with, or presently succeeded by, a deranged or excited state of the circulation; this derangement of the circulation differing in degree in different cases, and displaying a greater or less tendency to congestion, or even inflammation, of particular parts:" and,

3dly. "In the progress of every *idiopathic* fever, the secretions or excretions of the body become deficient, vitiated, or even irritating to the parts with which they come in contact."

In this description, it is evident that the authors have fallen into the common error (as

I conceive it to be), of confounding the *primary* and essential symptoms of the disease with those that are *secondary*, and common to all febrile disorders. It is under the first head only that the *pathognomonic* or distinctive characters of fever are to be found; and which consist, as here stated, in a derangement, in different degrees, of the functions of the *nervous system*, or, as I should say, of the *brain* exclusively. The deranged or excited state of circulation, and (the natural consequence of this) the disordered state of the different *secretions*, come under the head of *pyrexia* or *symptomatic* fever, such as results from inflammation in general, and by no means belong to proper or idiopathic fever peculiarly, as I trust has been already sufficiently shewn.

In developing the character of *idiopathic* fever, the authors follow the example of Dr. Cullen, in dividing the disease into three *species*, namely, the *intermitting*, *remitting*, and *continued*; and, like him, considering the *intermittent* as the type that best serves to illustrate the whole *genus*. To this, however, there are weighty objections. The *intermittent* (and like-

wise the *remittent*, for this is merely an aggravated state of the former) may be considered rather as a *specific* disease; peculiar in its characters, in its cause, and also in its treatment; in all which respects it differs from the *continued* form of fever, which it scarcely more resembles, indeed, than does the small-pox, or any other of the fevers of acknowledged *specific* origin. It is to the *continued* form of fever, therefore, that we must look, in order to find the distinctive characters of fever altogether.

Continued fever is arranged by the authors under the three heads of *mild*, *severe*, and *complicated*; the two former differing only in degree; the latter, marked by a predominant affection of some particular organ, but especially the alimentary canal, brain, or lungs. This secondary affection rendering the fever complicated, the authors (in deference, it would seem, to general opinion, rather than their own convictions) hesitate to refer to actual inflammation of the organs so affected: yet, if the description here given of such complications of fever be carefully perused, it seems to me im-

possible to come to any other conclusion, than that inflammation is actually present in those organs. Still, these are but accidental combinations, and do not at all decide the question as to the intrinsic nature of fever. It is the simple and uncombined form of the disease, whether mild or severe, that must be looked to for such a purpose; for in this only can the distinctive characters be found.

The authors describe the *mild* form of fever as it usually appears in children and in adults respectively. After enumerating the ordinary *febrile* symptoms that are common to all, they remark that "the principal sources of complaint are the headache and pain in the limbs. The headache, however, although it may occasionally suffer some aggravation towards night, is very rarely attended with any intellectual disturbance beyond a slight confusion on first awaking from sleep, which, even in this mild form of the disease, is for the most part disturbed and unrefreshing." In adults, the symptoms, though still mild, are described as somewhat more severe: "The headache, the

depression of strength and spirits, the restlessness and want of sleep, are all found to take place in a higher degree, with, in some instances, slight accessions of delirium during the night: and to these is added, an expression of distress in the countenance that is highly characteristic of *continued fever**." The duration of the disease in adults is apt also to be more protracted; while there is, at the same time, a strongly-marked tendency to assume a more severe character.

Such are the symptoms that are said to characterize fever in its simplest and mildest form, and which cannot, I think, be otherwise considered than as the result of a disturbed state of the *sensorial* or proper functions of the brain. The severer form of the disease, as here described, points still more strongly to the brain as the primary seat of the disease. The aggravated characters sometimes appear at the outset of the disease; sometimes they arise during its course, and that either without any assignable cause, or from injurious treatment or bad ma-

* Page 73 et seq.

nagement. The accession of bad symptoms during the course of a previously mild disease is thus forcibly depicted:—"The languor and debility become more apparent; the eyes appear dull; the countenance more shrunk, and expressive of distress; the breathing becomes somewhat laborious, and the voice more feeble; the tongue, from being moist, gets dry, and partially covered with a brownish fur; the skin is parched; the pulse more frequent, and more compressible; and the patient sinks into a more supine position. The symptoms are speedily succeeded, or actually accompanied, by a more manifest disturbance of the brain. This disturbance at first, perhaps, consists merely in a slight degree of confusion on awaking from sleep; the confusion, however, soon amounts to actual wandering, especially during the night, but sometimes, in many instances, throughout the whole of the day. In other instances, the cerebral disturbance shews itself in the form of confusion, or a stupor from which the patient is with some difficulty roused, and into which he presently again relapses. If

we do rouse him, his answers to questions are short, and for the most part incoherent; and he will often continue muttering to himself, although no one is near. It not unfrequently happens that, with a greater or less degree of this latter modification of cerebral disturbance, the patient will manifest more or less of nervous agitation, almost amounting, in some instances, to tremor, especially when any one addresses him, or on attempting to make any exertion. The tongue is sometimes morbidly red and clean, or polished; at other times dry, and of a yellowish-brown colour; and it will tremble when protruded. This state is also attended with remarkable drowsiness, and repeated flushings of one or both cheeks."—"When such cases prove fatal, the oppression of the several organs increases; the exhaustion of the vital powers becomes extreme; the stools and urine pass off involuntarily; and the patient lies supine and helpless in bed, muttering and insensible; whilst, in the worst cases, hæmorrhages of dark blood take place from the nose, from the bowels, or by urine; or blood is

poured out by the cutaneous vessels, producing spots of a livid or purple colour, or marks resembling bruises; in which wretched plight the patient lingers, till death terminates his sufferings*."

Such is the striking picture of the aggravated state of fever here drawn; and it appears to me next to impossible not to refer such symptoms to the *sensorium*—in other words, to the *brain;* for they consist entirely in a disturbance of the proper functions of this organ—the *sensorial.* The authors, indeed, refer to the *nervous system altogether* as the seat of the disease, rather than to the brain exclusively. But that an affection of the brain alone is adequate to the production of such symptoms, seems sufficiently proved, both by the effect of injuries and acknowledged diseases of this organ. And if this be true, it is hardly consistent with just reasoning to go further, and multiply causes where one alone is sufficient for the purpose of explanation. Indeed, many of the most prominent of the symptoms of fever can only be

* P. 75, et seq.

explained by reference to the brain exclusively. Such is the case with regard to the disturbance observed in the different *organs of sense,* in that of the *mental functions,* and in the *voluntary power;* all of which are constantly observed to be more or less disordered in every case of proper fever, and that always in proportion to the violence and danger of the disease: whereas other organs suffer occasionally only; and when such is the case, it serves only to render the disease complicated in its form. The admission of the authors themselves goes far towards establishing the point in question; for they observe*, "that, either primarily or secondarily, we know the brain to be more or less affected in every case of fever; the affection, varying in intensity, being scarcely less manifest in the *mild* than in the *severe*—in the *early,* than in the *later* periods of the disorder." This admission, if well founded, naturally leads to the suspicion that the brain is essentially, and not casually, concerned in fever; more especially when it is considered that no other

* Elements, p. 82.

organ than the brain is so constantly affected, and so decidedly deranged in its functions.

Thus it appears that the difference between us is little more than verbal; for by merely substituting the term *brain* for that of *nervous system,* as employed by the authors, the discrepancy in a great measure vanishes.

On the other hand, the supposition that the whole *nervous system* is equally involved with the *brain*, in the production of the phenomena of fever, is attended with many difficulties. It is a point by no means easy of proof, if conceded; for there are not the same means of discovering an affection of so many different parts, as the *nervous system* altogether is composed of, as where the *brain* singly is affected. The admission would, in fact, prove too much. A simultaneous morbid affection of the whole *nervous system,* comprising, under this denomination, the brain or *encephalon*—the spinal chord, and the nerves, both cerebro-spinal and ganglionic, with their appendages—might be expected to give rise to a far more varied train of symptoms than is actually found to take place in

proper fever. We might expect, for example, to find *convulsions*, *tetanus*, *spasms* in various parts, and *paralysis* of different kinds and degrees, as ordinary attendants of fever; whereas, in reality, such symptoms are of very rare occurrence: and when they do occur, they are easily explained by reference to the brain alone, or, at most, by the supposition of an extension of the disease down the spinal chord, which sometimes seems to take place.

With respect to the second point of the theory of fever, the *nature* of that affection of the brain which is allowed "to be present in every case of fever, in the *mild*, as well as in the *severe*—in the *early*, as well as in the *later* periods of the *disorder*,"—the authors remark as follows: "we are altogether unacquainted with the actual condition of the brain in the earlier stages of fever; and although more or less of *excitement* of the organ always succeeds to reaction, we have no evidence that that excitement amounts to inflammation *in every instance*. That inflammation of the organ, or of its membranes, does *frequently* occur, is proved alike," they further ob-

serve, "both by the symptoms during life, and by dissection after death: but we are in possession of no positive or infallible tests, by which to determine its existence or non-existence, *in every case:* neither can we ascertain with precision, how much of the cerebral disturbance results from the actual condition of the encephalon itself, and how much of it depends upon mere sympathy with other suffering organs*."

It cannot fail, I think, to be remarked here, in regard to the passages just quoted, that the authors are far from positively denying the existence of inflammation in the brain in fever in general: they only say, that we are unacquainted with the actual condition of the brain in the *earlier* stages of the disease; they allow that there is more or less of *excitement* present, but that we have no evidence that that excitement amounts to inflammation *in every instance;* yet they admit that inflammation of the organ or its membranes does frequently occur, as proved both by symptoms and by dis-

* P. 83.

section. They observe, "that we are in possession of no positive or infallible tests by which to determine its existence in *every* case." Now there are but two modes of ascertaining the existence of inflammation in any case,—one, by symptoms during life; the other, by dissection after death. The latter test, dissection, is, of course, not applicable to the milder forms of the disease, for these do not terminate fatally; and, therefore, it is only by symptoms that the case can be judged of. The severer and more dangerous forms of the disease are marked by well known symptoms, which are here placed in the strongest light; and in these cases, inflammation of the brain is allowed to be present. "The most decided marks of inflammation of the brain or its membranes in fever," it is observed, "are commonly met with at an early period after re-action, in young adults of good constitution and full habit of body. They occasionally present themselves so early as the third or fourth day of fever, and consist of acute pain within the head, wildness and suffusion of the eyes, intolerance of light and noise, extreme

restlessness, violent delirium, a frequent sharp pulse, a dry, parched, and generally hot skin, and a dry and brown (more rarely a moist) tongue. If these symptoms be not promptly checked, the patient falls into a state of exhaustion; he lies prostrate in bed, moaning, muttering, or uttering faint cries of distress; rolling about his body, picking the bedclothes, and, when sufficient strength remains, manifesting a remarkable degree of jactitation. At length the eyes roll about in their sockets, cold clammy sweats appear, the urine and stools pass off involuntarily, the pulse sinks, and death quickly follows."

Now, if this state of things, as occurring in the severer cases of fever, is so unhesitatingly admitted to be characteristic of inflammation of the brain, I do not see how the existence of inflammation can be questioned in the earlier and milder stages of the disease; for the symptoms are similar in nature in both cases, and differ only in degree. The mildest cases of fever, at first, are often seen to degenerate into the most severe, and that by gradual and

almost imperceptible changes. There is no visible line of demarcation by which the early and mild is separated from the later and severer stage of the disease, so as to enable us to mark precisely the actual accession of inflammation.

I am tempted to quote here another paragraph, because it bears still more strongly on the question. It alludes to fever in its ordinary state, such as is met with almost daily; whereas the statement before made applies to what may be called an extreme case, and is therefore of less weight in argument. "It is probable," the authors remark, "that the aggravation of symptoms, which not unfrequently takes place about the eighth or tenth day of *an ordinary mild fever*, is owing, in many instances, to a corresponding, though less violent, *inflammatory condition* of the brain. The delirium, indeed, is less violent; but the great restlessness, the increase of languor and prostration, the dull expression of the eye, the feeble voice, the dry tongue, the frequent sharp pulse, and occasional starting of the tendons, sufficiently declare a state of brain

which, *if it be not actual inflammation, is one which is closely allied to it, both in its nature and its consequences.* Neither is it unlikely that in fever, as in idiopathic inflammation of the encephalon, the symptoms are different accordingly as the membranes, or the brain itself, happen to be principally involved: the violent *excitement* appertaining chiefly to the former; the more *depressed* condition, to the latter."

That the symptoms of the early stage, as here described, are the same in nature, and therefore indicate a similar origin, may be gathered from the following: "Pain in the forehead or occiput, noise in the ears, confusion, giddiness, a sense of weight in the head, together with corresponding mental infirmity, and even delirium, are symptoms, some of which are almost uniformly present in the early stages of every fever, and, when moderate in degree, are such as neither bespeak organic change, nor portend danger*."

It may be worth while to quote here the remarks of the authors on the subject of what they

* P. 82.

term *simple inflammatory fever*, identical with the *synocha* of Dr. Cullen. The consideration of this is placed at the head of the *phlegmasiæ*, with which it is said to be closely allied, and with which it is frequently combined. They endeavour to draw a distinction between this, the *synocha*, or, as they term it, *simple inflammatory fever*, and common *continued fever*, before described; from which it is said to differ chiefly "in the abruptness of its attack—in the early development of acute vascular excitement—in its shorter duration, and in the comparatively inconsiderable loss of muscular and vital power which attends or results from it." Nevertheless, it is allowed "that in some rare instances, it has appeared to pass into a form of fever not distinguishable from *common continued fever*." In fact, there is no essential distinction between them—the difference is in degree only. In the description given of this *simple inflammatory fever*, this *synocha*, as Dr. Cullen calls it, the characters of *pyrexia*, or *symptomatic* fever, are confounded with those of proper or *idiopathic* fever; and hence the difficulty of dis-

tinguishing between the two. "The flushed face, the suffusion of the eyes, the pain or throbbing at the temples or within the head, the aching, uneasiness, and general soreness over the whole body, the great restlessness, watchfulness, and sometimes delirium, during the night," are all referrible to the brain, as they manifestly consist in a disordered state of the functions of this organ; accompanied with that increased arterial action in and about the head, which denotes the inflammatory state of the part. The other symptoms are merely those of *pyrexia* or *symptomatic* fever.

In short, the real and essential difference between the *mildest* and the most *malignant* form of fever, appears to consist merely in the degree and extent to which the brain and its functions are suffering. In the milder form, and at the outset of the disease (and that even in many cases where the most *malignant* symptoms appear afterwards), the brain suffers but little. The inflammation is slight in degree, and is therefore attended with but little disturbance of the *sensorial* functions. The febrile

symptoms *(pyrexia)* may, indeed, run high, as in what is here called the *simple inflammatory fever*—the *synocha* of Dr. Cullen—yet with little danger to the patient, when properly managed. By active *antiphlogistic treatment*, the disease generally subsides altogether (as it often does, indeed, spontaneously), and that within a very limited period. Should this not be the case, the common *febrile* symptoms (the *pyrexia*, or general vascular excitement) decline in some measure, but the brain affection continues and gradually increases. The disease then takes the name of *synochus*. The brain suffers more and more, both in its structure and functions. The proper symptoms of fever continue to increase until, in extreme cases, they acquire the highest degree of *malignity*, and thus the patient is destroyed; not, as has been supposed, from simple debility, but from the local organic mischief suffered by the brain.

It is no doubt true, that we are unacquainted with the actual condition of the brain in the earlier stages of fever; that is to say, we cannot have demonstrative proof on the subject,

because the disease does not then destroy life, and dissection, consequently, is of no avail. We have, however, the evidence afforded by *symptoms*, and which is scarcely less conclusive. Pain, accompanied as it is in this case by heat and throbbing of arteries, and marked disorder of functions, are signs from which we infer the existence of inflammation in any part; and if such signs be further accompanied by a febrile state of system, the evidence is deemed conclusive: and such we have in the earlier as well as the later stages of fever. The aid of dissection can only be had in the more violent and fatal cases of the disease, in which the symptoms, as admitted by the authors, "sufficiently declare a state of brain, which, if it be not actual inflammation, is one that is closely allied to it, both in its nature and its consequences."

Dissection itself, however, is not at all times conclusive, in regard to the evidence it is capable of affording as to either the seat or nature of fever. In the first place, because fever-patients do not always die from the fever itself,

but from some supervening disease, most frequently from inflammation in the abdomen; and in such cases the proper symptoms of fever may subside before death, and, of course, the disease would leave no traces behind it of the previous brain-affection. And even where the patient has been actually destroyed by the inflammation of the brain, the *post-mortem* appearances are not always so strongly marked as to excite much attention on the part of those who are not very familiar with morbid anatomy. Visible alteration of structure, it must be remembered, is a remote and not an immediate effect of inflammation in the brain. The disease kills by the violence of action, and consequent interruption of functions, and not by any alteration in structure which the eye is always capable of appreciating. The structure becomes changed slowly and gradually, in proportion to the duration rather than the violence of the disease. Hence all the most violent cases of inflammation of the brain, when they prove quickly fatal, whether in the form of acute hydrocephalus, of phrenitis, or fevers of unusual

rapidity and violence, leave behind them in the brain the faintest traces of the preceding malady. It is from symptoms, therefore, and not from dissection, that the most satisfactory evidence is derived on such subjects.

Upon the whole, it may be observed, that the points which make the subject of the foregoing comments are of no small importance in a practical view. If the mild and early stage of fever be, as I believe, merely the commencement or first stage of that inflammation of the brain which the authors of the "Elements of Medicine" allow to be an almost invariable, if not an essential, accompaniment of the severer and more advanced stages of the disease, then it is of the greatest moment that the active measures they suggest, as applicable to this state of things, should be resorted to at the very outset; by which so dangerous a state may often be anticipated, as it were, and prevented: and such, I have ample reason to know, will generally be the result.

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