is real, as it is then connected with a general collapse, which sooner or later succeeds to a state of febrile excitement, as certainly as exhaustion follows a fit of intoxication. Those who have adopted the beautiful, but deceptive, doctrines of Dr. John Brown, will on no account admit, that the debility of typhus is only seeming, during the greater part of its progress. In candour, the impartial observer must confess, that this proposition is not evident at first sight; yet it is as certainly true as any in physic, as is proved from the debility in the first and second stages being increased by wine and cordials, and lessened by a spare regimen and evacuations.

Soon after the attack of this fever, there is a peculiar depression of the mental and voluntary powers, which had been justly placed, by authors, among those symptoms, that most forcibly press themselves on the attention of practitioners, and of which patients most frequently complain. This peculiar depression has generally been thought to indicate, that the brain and nerves are primarily affected, as they constitute a medium, through which the mental and voluntary powers entensively operate. Accordingly we find, that several celebrated theorists, differing widely on subordinate points, agree in assuming, that typhus is a disease in which the energy of the nervous system is directly and greatly impaired. But, doubtless, far too much stress has been laid on this assumption, an assumption which, it is to be feared, has done considerable harm, by leading to the stimulant treatment, and by rather fixing the attention upon one train of symptoms, than directing it to a comprehensive view of the whole.

The general system comprehends within itself many subordinate systems, the proper functions of which must harmonize to form perfect health; and the constitution of our frame is such, that no one part of importance can be materially disordered without re-acting on other parts, which in their turn likewise give rise to a series of morbid actions—and thus the whole system is finally drawn into consent. Every limited theory of fever, therefore, must necessarily be erroneous, whether founded upon diminished nervous energy, or any other plausible hypothesis; since it must be at once apparent to unbiassed individuals, that almost all the organs and functions of the body are brought, in one way or other, under the influence of the disease. Yet if any particular system be more affected than another, it is the sanguiferous, through which the *permanent* effects of fever are chiefly to be traced, and by which the state of the brain and nerves, at least, seem ultimately to be regulated, how much soever the nervous system may be immediately concerned in the primary impressions. So great indeed, in a practical point of view, is the importance of attending to the state of the circulation in febrile complaints, that guarding against what are called determinations of blood to the different viscera, and removing preternatural accumulations, whether congestive or inflammatory, when they actually take place, will be found to constitute one of the grand secrets of successful treatment (4).

It is not perhaps easy to distinguish simple excitement of the circulation from actual inflammation. Yet every experienced and unprejudiced practitioner will readily allow, that fevers do occur, in which there is a general increase of arterial action, without inflammation; as might be instanced in the disease of lying-in women called the weed, in the mildest forms of intermittents, and in several of the febrile affections of children. But what is the difference between simple excitement of the circulation and inflammation? The chief difference seems to consist, not in the state of the general circulation, but in that of particular parts. The action of the heart and larger arteries is alike augmented in both; but

(4) It cannot be otherwise than gratifying to every American to trace the genius of Dr. Rush anticipating the profound and accurate views of pathology, which are at present entertained by the first writers of the day, at the same time that it must excite his just indignation to find not merely the writings but the very name of our illustrious countryman wholly unnoticed. Our limits will not permit us to enter into an elaborate defence of the claims of Dr. Rush to the admirable theory which inculcates the necessity and importance of attending in practice to the state of the circulation in fevers, and of relieving irregular distributions of the circulating blood, to different parts of the body. It will suffice to refer to the "Outlines of the phenomena of Fever," in Vol. III. of Rush's Medical Inquiries and Observations, for ample proof on this subject. The doctrines taught by Armstrong and his colleagues in Britain will be found there, delineated with that clearness and precision of style for which Dr. Rush was so remarkable.

there is in inflammation a greater local accumulation of blood, than in simple excitement. Nevertheless topical accumulations of the blood take place in disorders of simple excitement; and we often see it spontaneously terminate, by what may be called pure resolution; but such a termination is comparatively rare in actual inflammation. Still it must be confessed, that the topical accumulation attendant on simple excitement, has generally a strong predisposition to inflammation; and may easily pass into the latter state, from the heart and larger arteries continuing to propel too much blood into the capillary branches.* In short, simple excitement of the circulation and inflammation have naturally an affinity, and may so mutually approximate as to be lost in each other. In simple excitement, the blood is almost equably diffused throughout the system, in inflammation it is superabundant in particular parts. Yet when the blood is superabundant in any particular part, it must pass beyond a certain measure before it can constitute inflammation; for we would not denominate the increased afflux of blood in the intestines inflammatory, which is produced by a purgative, neither that of the skin which is produced by common rubefacients. And what is here asserted of a part, may also be asserted of the whole arterial system: for in like manner we would not call inflammatory, the condition which follows the drinking of a few glasses of wine. Excitement, local as well as general, may exist without inflammation, but inflammation cannot exist without excitement.

The state, then, of the circulation in the second stage of the simple typhus necessarily resembles inflammation; yet, in strictness, the organs most affected by increased accumulations of blood, may be said to be excited, rather that positively inflamed. Although, as shown in the preceding pages, this stage may, and sometimes does, proceed without decided inflammation, yet as topical inflammation may arise during its existence, the medical attendant should never be too confident, that the disease will always continue to be one of simple excitement. On the contrary, he should be constantly upon his guard from the commencement; and, day after day, make the most scrupulous inquiries, that he may be enabled to detect, and, if possible, to arrest the very first appearances of inflammation supervening in a vital quarter. The pathology of the simple typhus is applicable to almost all the mildest forms of other fevers; for from whatever cause they may originate, or however they may differ in minor respects, the states of the vital organs will be nearly similar.

It seems an acknowledged law of the animal economy, that when any part of the body is once put into a state of irritation, there is a greater flow of blood than natural in that direction. This law should always be remembered in typhus and similar fevers, which necessarily give rise to more than one local irritation at the same time. If opportunely attended to, simple irritation may generally be soon removed, but if neglected in its origin, it may tend to produce not only an increased afflux of blood, but an actual inflammation, in some part. Since then from a variety of circumstances, typhus may, however simple in its outset, become connected with local inflammation, that modification of the complaint shall be next brought under the review of the reader.

* Is it probable that there is a greater loss of balance between the arteries and veins in inflammation, than in simple excitement of the circulation? The relations existing between the arteries and veins in health have been well explained; but it appears to me, that we have not been sufficiently attentive to the conditions which relatively exist between these two systems of vessels, in many acute and chronic diseases.

Since the first edition of this work, however, was published, my friend, Dr. Abercrombie of Edinburgh, has taken up this subject with respect to apoplexy, and has discussed it in a most masterly manner.

THE INFLAMMATORY TYPHUS.

In pleurisy, and similar disorders, the seat of fever may be local, its effects general, and its nature inflammatory; but some ingenious authors, with Ploucquet and Clutterbuck at their head, seem to me to have proceeded too far, in confidently asserting that this is actually the case in what are called idiopathic fevers. As an example in point, typhus undoubtedly sometimes begins and terminates without topical inflammation; and as inflammation may occur in one or more parts, without ever producing an infectious distemper, with

the true characteristics of typhus, it is evident, that inflammation is not its inseparable and essential constituent. When, therefore, this peculiar disease and inflammation are combined together, it appears only reasonable to conclude, that the latter may have been produced by cold, or any other common cause of fever, operating with the contagion; or that it may have arisen as an effect of the excitement of the heart and arteries, favoured by some predisposition to inflammation in the part affected; as an inflammatory affection of the chest often arises in the measles, though each may exist independent of the other. Some authors have contended, that the inflammation which accompanies the complicated forms of typhus, occurs with the fever, or even precedes it, and others, that it merely follows as a consequence of the general excitement. According to my observations, the local inflammation occasionally commences as soon as the fever itself, but generally arises during the stage of excitement; and hence, perhaps, it may be fairly inferred, that, for the most part, it stands in the relation of an effect, rather than a cause of the fever. If we reflect, that more or less venous congestion attends the first stage, it will not seem improbable, that, by a preternatural distension of the vessels, it may leave a morbid tendency in some organ or other, which might pass into inflammation, by the excitement of the second stage. It usually happens in what are called symptomatic fevers, that the inflammation is limited to one part in particular, but this does not so generally obtain in typhus: for though one organ may exhibit by far the strongest evidences of inflammation, some other part will often be affected in a less degree; and this surely favours the notion, that the topical disorders are commonly the products of the general excitement. But the mode in which inflammation is produced in typhus, it is not so practically important to investigate, as at what time it takes place, what characters it assumes, and in what parts it is seated.

In viewing typhus always as a general disease, and deeming its seat, like that of the mind, unapproachable, some noted authors have neglected to investigate its effects on the viscera and their appendages; and of course, they have almost entirely overlooked those local affections, with which it

is frequently connected, and which are the causes of its fatal termination in its inflammatory variety. Some eminent pathologists, however, have of late forcibly called the attention of the faculty to the morbid anatomy of fever; and this subject seems now to be in a fair train of investigation, which promises not only to correct many prevalent errors, but eventually to lead to the establishment of general principles, in the treatment of all acute fevers (5).

It was formerly noticed, that in the simple typhus there is generally a morning abatement and an evening exacerbation of the fever, and this is the case in most fevers of a simple character; but whenever typhus is complicated with inflammation, and the remark is alike applicable to other fevers, the morning remissions are scarcely ever observable, the continual irritation of the local disorder maintaining a more constant elevation of the temperature. It might almost seem superfluous to point out this circumstance, but some ingenious men have pretended, that were the fever at all remits it is not the genuine typhus; and by a parity of equally erroneous reasoning, it might be said, that the simple scarlet fever is altogether a different disease from the scarlatina anginosa, because the former does and the latter does not remit. In typhus, the brain, or its meninges, the spinal cord or its coverings, the lungs, the pleura, the mucous membrane of the tra-

(5) The remarks of Dr. Armstrong on this subject are particularly deserving of attention. At a time when exclusive theories, advocating the identity of local inflammation with fever, and denying in short the existence of idiophathic fever altogether, are become so popular, and are supported with so much weight of talent and learning, the calm and unbiassed student of nature cannot be too much on his guard against the seductive simplicity of fanciful speculation. At the same time it would be unjust not to admit that the labours of such men as Clutterbuck and Broussais, have in some respects been attended with the happiest effects. They have tended to awaken attention to the contingency of inflammation in fevers, and have thus disarmed practitioners in a very great degree of their former fears of debility and putrescency. To avoid the opposite extreme is, however, no less essential to successful practice. Yet into this extreme must all those theorists unavoidably fall who deny that fever *can* exist without inflammation, and who consequently insist on the absolute necessity of depletion in all cases. Experience must sooner or later reconcile all these differences.

chea, the stomach, the liver, the peritoneum, the small and large intestines, are the parts most liable to be attacked by an acute, or sub-acute form of inflammation. Correctly speaking, however, the acute and sub-acute forms of inflammation merely differ in degree; and, therefore, those relative terms are only meant to express the higher and lower degrees of the same morbid state. The propriety of making this distinction cannot be fairly disputed, since these different degrees of inflammation considerably vary the character and duration of the typhous cases, in which they happen to occur.

Though the sub-acute occasionally changes into the acute form of inflammation, and *vice versa*, yet each of these forms commonly begins and proceeds with its peculiar characters. The acute form generally arises on the first, second, or third day of the second stage, and being most active, is clearly denoted. Whereas, the sub-acute form usually arises after the third day of the second stage, and being less active, is at first obscure; so that the practitioner is for some time left to form his opinion, respecting its site and extent, rather from uneasiness in particular regions, and co-incident derangements in particular functions, than from violent pain, and other palpable symptoms, attendant on the acute form.

Whenever, after an attack of typhus, there is a distinctly felt and fixed pain in the head, chest, or abdomen, with great quickness of the pulse, dryness of the tongue, anxious breathing, and much general oppression,—the presence of the acute form of inflammation may be inferred. If there be little or no pain, and the pulse should become very frequent, the respiration more hurried, the tongue more parched and foul, and the general oppression greater,—the approach of the sub-acute form may be apprehended. But as these modifications of inflammation require correspondent differences of treatment, it is proper that they should be more particularly noticed.

So far as my remarks have extended, the brain and its investing membranes are more subject to inflammation in typhus than any other parts of the system (6). When the acute form of

(6) It is this circumstance of the frequency of inflammation of the brain in typhus which first gave rise to the theories of Ploucquet and Clutterbuck. As

inflammation exists within the head, it is generally marked by various signs. Great irritability; an anxious oppressed, or intoxicated cast of the countenance; dry, foul tongue; quick, vibratory pulse; flushed, turgid face; * deep pulsating pain in the head; increased heat of the temples, forehead, and hairy scalp; throbbing of the carotid arteries; tinnitus aurium; redness and morbid sensibility of the eyes; and more or less disorder in some other of the external senses. There are generally transient pains in the limbs; oppression of the præcordia; torpidity of the intestines; uneasy respiration, attended with heavy sighs; nausea, retching, or vomiting, augmented on motion; fretfulness, and jactitation. Watchfulness, confusion of mind, visual illusions, and delirium, follow each other in quick succession. If the inflammation should uninterruptedly advance, to these symptoms succeed, indifference to surrounding objects; faultering or imperfection of the speech; gradually increasing stupor; bloatedness of the face; brown or black parched tongue; low mutterings; tremors of the hands; stupid, suffused, watery eye; squinting or dilatation of the pupil; paralysis of one of the palpebræ; vibices or petechiæ; oozings of dark blood from the mouth and nostrils; stertorous breathing, general convulsions; relaxation of the sphincter muscles, and other mortal signs. Recently I saw an old and corpulent lady labouring under typhus, in whom there was, from the beginning, an excessive disturbance in the circulation of the head, and an almost incessant sickness of the stomach. In defiance of every effort, the cephalic symptoms advanced. About the fourth day from the attack, she had a distinct stroke of hemiplegia, and became totally blind in the left eye, which was affected with strabismus. Shortly after the accession of the palsy, though she had previously been afflicted with great intellectual disorder, she be-

will however appear in the sequel, other viscera are equally subject, where previous predisposition exists to excessive accumulations of blood and to inflammation. The descriptions of our author are remarkable for their accuracy and fulness. They ought to be carefully studied by the young practitioner.

* In a few instances of this nature, I have known the face even paler than natural; the contrary, however, as stated above, is generally the case.

came perfectly collected, and continued so for several hours; when she gradually sunk into a state of collapse and coma, and at last expired in strong convulsions.

But sometimes acute inflammation of the brain in typhus is not to be discriminated by the succession of symptoms above described. In such cases, it is mostly to be recognised in the beginning by a glary blood-shot eye, a contracted pupil, an agitated expression of the countenance, and a peculiar species of moaning, which scarcely ever ceases for a moment; and to these indications, confusion of mind, tremors of the muscles, and coma often rapidly succeed, and the patient expires at last with a bloated, pale face, and laborious breathing. The pulse in some instances of this nature is less disturbed than might be imagined from the violence of the attack, and I have known it at first little above, and before the termination even fall below its natural standard. In the commencement of most affections of the brain in fever, one of the best tests is to desire the patient to shake the head: if inflammation exist he will move it very slowly and fearfully, and complain of a great increase of uneasiness; and where it is quickly and stoutly shaken without much uneasiness, little or no danger need be apprehended in that quarter from inflammation.

When the brain is early and actively inflamed, typhus sometimes passes on with great celerity to a mortal issue, the stage of excitement not occupying more than forty-eight hours, and the subsequent one of collapse a still shorter time. In general, however, the acute inflammation of the brain proceeds less rapidly, and the disease is protracted a little beyond the first week. But the sub-acute inflammation of the same part, next to be noticed, is much more common than the preceding in typhus, and occupies, from first to last, a considerably longer period.

For some days, the sub-acute inflammation of the brain most frequently steals on in typhus by almost imperceptible approaches. At first there are little more than the usual degrees of head-ache and of vertigo, with general lassitude, fugitive pains in the muscles or joints, torpid bowels, and uneasy feeling at the pit of the stomach commonly accompanied with loathing of food, and a disposition to sickness of stomach, especially on any sudden change of posture. The pulse is small and quick, but the carotid, and even the temporal, arteries beat with rather more than ordinary force. The tongue at first is covered with a dirty, whitish fur; the cheeks are alternately pale and flushed throughout the day; the countenance has a heavy, wearied expression; and the eyes often feel uneasy, as if small particles of sand were in them. Besides, some of the rest of the external senses are almost always disordered, particularly the hearing, which, though occasionally more obtuse, is generally more acute than natural, and the head cannot be shaken without an increase of uneasiness. The forementioned symptoms continue without material alteration for three or four days; although the patient may often be remarked to sigh, breathe quicker, and grow more irritable, as well as restless, seldom remaining long in the same place or position. At length, pain of the head, and uneasiness in the orbits of the eyes are more severely felt; the eyebrows are sometimes suddenly knit together; the arms tossed about the bed; or one or both hands now and then pressed against the forehead. The pain of the head continues to increase; and in two or three days more there are sensations of an indescribable uneasiness, constantly and distinctly referred to the brain. The eyes are now rather blood-shot, and intolerant of light; the anxiety of the præcordia is much augmented; the respiration more hurried; the heat of the surface more elevated; the face permanently flushed; the tongue drier and stiffer; and the involuntary sighing more frequent. The patient now lies at nights with his eye-lids half closed, in light distinct dozings, associated with moaning, frightful dreams, and startings; or he is harassed by perpetual watchfulness, joined with frequent wanderings of the mind. As the inflammatory affection advances, day after day the sensorial functions continue to be more and more disturbed. At last, delirium becomes unceasing, when signs of an oppressed brain gradually make their appearance; under which the patient slowly sinks into dissolution, with hiccup, petechiæ, subsultus tendinum, an apoplectic expression of the features, and a red, glary eye, floating insensibly in an envelope of mucus. When connected with the sub-acute kind of inflammation of the brain, ty-