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A

SHORT TREATISE

ON

TYPHUS FEVER.

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PREFACE.

The subject briefly discussed in the following pages involves a considerable share of medical literature, and is as complicated in its nature as difficult in practice. To have approached the consideration of a most important fever without thought and reflection would have been quite unpardonable, yet the pains bestowed upon it appear as nothing when compared with the attention that it deserves. Of the faults and incompleteness of this short treatise, no one can be more aware than its author, but only those who have studied the prevailing epidemic, traced the history of corresponding disorders, and consulted the numerous works which have been written upon it, can appreciate the toil which a full investigation would require. The objects which have been aimed at are the following: to assert the claim of the prevailing epidemic to be ranked among specific fevers, to separate it from some with which it has long been improperly confounded, to show at the same time its analogy with others, and to improve the pathology of all. The following treatise would

have been more complete, and been illustrated by more cases, had not the author's time been much occupied by various professional avocations, and his labours interrupted by severe indisposition: but he prefers that his work should at once be published, imperfect indeed, but with the chance of being useful, whilst the fever which gave rise to it is still raging, than be kept back with the possibility of improvement till the disease which it treats of has passed away.

15, Welbeck street, Cavendish Square,
February 28, 1839.

ON

TYPHUS FEVER.

It will readily be granted that we are but imperfectly acquainted with the nature and cause of many diseases. It will also be admitted, that unless the seat, the character and the progress of a disorder be ascertained and understood, treatment will be without precision, and practice must be unsatisfactory and often unsuccessful. Typhus fever will exemplify these remarks. True it is that we have very many writers on the subject, but their descriptions are so indefinite, and their nomenclature so varied, as to leave it doubtful whether their several statements allude to the same affection under different appellations, or to numerous ailments allied in character and only to be distinguished by nice discrimination.

Febrile diseases of various kinds are always present to a great extent amongst the humbler classes of the community; they often prevail epidemically, unknown to or unnoticed by society at large, and provided they be mild in degree and confined to a circumscribed district, little general attention will be paid to them. When, however, the occurrence of any such disorder is frequent, and its attacks severe, alarm is excited, calculated on this as on other occasions to distort facts and to favour erroneous impressions. The aggravation or more full developement of any ordinary malady may thus be mistaken for a fresh commencement, and an unusual form or a heightened feature in a known complaint may be thought to constitute a new disease.

In every city the great hospitals will always indicate the general state of health, and in proportion as they afford facility of admission will be a true criterion of the rise, extent and decline of any serious ailment. The regulations of our public institutions for the reception of the sick, throw the door widely open to those labouring under fever, and by this wise as well as humane arrangement, the spread of many infectious maladies is arrested and the best means are

afforded of relieving the severest afflictions of the poor. To the records kept at such establishments and to the cases therein admitted, must we turn for instruction, and to those entrusted with their charge will the public naturally look for information. When therefore, as during the present year, apprehension has been created by the unusual prevalence of an infectious disorder, some account of it from one attached to such an institution may rather be expected as a duty than need an apology for presumption.

A malignant disease has been, and it may be said is at this moment, rife amongst us. This is a fever which, from its frequency as well as from its nature, well merits the especial notice of the profession. It has in truth been more or less prevalent for several years past, and my attention has been particularly directed to it from the fact that a disorder precisely analogous appeared as an epidemic in the outskirts of London in 1831, when many cases were sent from the river side to the floating hospital for merchant seamen at Deptford, where they were under my charge as physician. Both before and since that time similar cases have frequently been met with, especially during the spring of the two last years.

Numerous instances have occurred in the crowded and ill-ventilated districts in the neighbourhood of St. Bartholomew's Hospital: and the admission of many patients under my care in that establishment, has enabled me to watch the course of this complaint, and from experience to learn much in its treatment.

To this disease it is proposed to apply and confine the name Typhus. As this term has been used by authors to designate diseases entirely different in their type and origin, much ambiguity exists, and many contrary opinions are entertained upon the subject. It becomes then an important matter to define accurately the malady to which the term should be restricted, and at the same time to assign to it a proper nosological position. This has not been accomplished, either by Sauvages, or Cullen; nor, it is submitted, has its real character been elucidated by more recent authors in our own country, though a point of the highest possible interest, and essential to the proper treatment of the disease.

Before my views on this subject are stated and the reasons specified which induce me to differ from the authority of others, it is imperative to give the definitions of the best and most modern writers.

Typhus is ranked by Sauvages in his Nosologia Methodica, published in 1768, amongst the continued fevers, and he thus describes it "Genus est febris continuæ quæ ultra duas septimanas sæpius tres extendi consuevit, cum calore et urinâ sanorum similibus, pulsuque quoad frequentiam, sano fere simili, quoad robur, non majori: artubus interea maxime prostratis."[1]

Cullen also places typhus in the list of continued fevers, and gives us the following description of it: "mobrus contagiosus, calor

[1] Sauvages Nosol. method. 4to. Amst. 1768, vol. i. p. 308.

parum auctus, pulsus parvus, debilis, plerumque frequens," "urina parum mutata; sensorii functiones plurimum turbatæ, vires multum imminutæ."[1]

In the Cyclopædia of Practical Medicine, published in 1833, we find typhus constituting a division of continued fever; and it is there described as "a peculiar form or type of fever, characterised by the more early and severe affection of the brain and nervous system—by the more constant changes which the mucous membranes undergo—by the affection of the cutaneous and glandular tissues—and in the advanced stage by great prostration and symptoms denoting putrescence."

And it is further added, "That it is not uncommon to find fever, which at first is very mild, assume by degrees the typhoid character." And again, "There can be no doubt of the existence of every intermediate gradation between the common forms of fever (synochus) and typhus, so that it becomes a matter of nicety to discriminate to which class a particular case or number of cases properly belongs. Sometimes we find, indeed, the one form passing into the other, more frequently mild fever lapsing into typhus."[2]

In the elaborate work of Dr. Copland,[3] typhus is described to be "a disease which after lassitude and general mal-aise, imperfect or suppressed vascular reaction, depressed vital power manifested especially in the nervous, vascular, and muscular system, gives rise to changes more or less evident in the circulating fluids and soft solids." Dr. Copland goes on to observe "that this fever cannot be said to differ specifically from synochoid fever, although certain varieties of it present very marked distinctions, indeed the severer forms of synochoid fever very closely approach or run into certain states of typhoid fever, the chief difference consisting in the sthenic vascular reaction in the early part of the period of excitement in the former. Even the milder cases of simple continued fever may gradually assume a typhoid state."

In the above descriptions, typhus is considered to belong to the continued fevers. It is looked upon by the more recent authors in this and other countries, not as an individual disorder, but as one into which others may readily be and frequently are converted.

Now the result of observation has been forcibly to impress upon me the conviction that the prevailing fever is owing to a certain specific cause. For when closely observed, it has been found to pursue a definite course, passing through its stages with regularity, spreading by infection, and being marked in its progress by a distinctive rash. Here then we have all the characteristics of the genuine exanthemata of authors, to which class it seems correctly and exclusively to belong. It has indeed for many years been so considered by me, and this view was submitted to the public in a

[1] Culleni Synop. Nosol. method. 8vo. 1780., vol. i. p. 82.
[2] Cycloped. Pract. Med. vol. i. p. 175.
[3] Dictionary of Pract. Med. still in progress, by James Copland, M. D.

paper read before the College of Physicians in 1831, and has been daily impressed upon my pupils on all occasions of clinical instruction. The idea I thought original, and, feeling that if established it would be important, my time has been much occupied in its investigation. On referring to authorities, in order to trace this epidemic in different countries and at various periods, I lately met with quotations on the subject, from a treatise by Professor Hildenbrand of Vienna.[1] In the account of this distinguished author the ideas just expressed are most explicitly stated. It becomes then necessary to give up all claim to originality, and as the disorder is fully detailed by this eminent physician, it is but just to adopt his account as a standard with which others may be compared. An abstract of his description will then be given in the first place, the analogy of other epidemics to this will be shown, afterwards some remarks will be made upon the succession of the symptoms and the nature of the phenomena observed in this fever.

Although Professor Hildenbrand especially alludes to the epidemic typhus of 1806, yet he observes that for twenty years and upwards he had studied the disease and had been placed in circumstances singularly favourable for such an enquiry, having had the charge of many prisoners as well as other persons infected with it. After explaining the meaning of the term typhus, and after giving a short history of the disorder, and other preliminaries, he proceeds to state that simple contagious typhus has eight stages or periods.

1. The first stage is that of contagion; this period he considers to be probably instantaneous, and is not indicated by any marked impression of which the infected person is conscious. On this point he speaks from his own personal experience as well as from that of others.

2. The second stage is that of incubation. In this there will be some slight alteration in the character or temper of the individual, there will often be vertigo, lassitude, weakness after exercise, unrefreshing sleep, tremor of the hands, pain in the loins, uneasiness at the præcordia, and foul breath. Yet the persons infected are able to pursue their usual occupations and do not consider themselves ill. This period may vary in duration, it is not usually shorter than three days nor longer than one week.

3. The third stage is that of the invasion or commencement of the fever. Typhus begins like other fevers by pain in the head, creeping sensations in the back, shiverings, alternating with flushes of heat, paleness of the skin, horripilation, and with feelings of despondency and great general depression. The effect on the system is a powerful one, as is the case in all serious and important maladies. Its actual commencement lasts six hours at least, and never exceeds twelve.

[1] This work is apparently but little known in our country, as not a single copy of the original could be met with in any of our libraries. I have therefore been obliged to content myself with a French translation by Mons. Gasc.

4. The fourth period is the inflammatory stage. This stage lasts a week, and the condition of the patient on the first day is as follows:—To the shivering which marked the commencement, febrile heat succeeds, irregular however in its distribution; the limbs if covered are hot, if exposed are liable to be chilled, moisture is often found on the skin. There is weight on the head, with a feeling like intoxication and vertigo, which is one of the most constant of all the symptoms. Nausea and vomiting are often present, which are rather to be referred to the state of the brain than to any morbid condition of the stomach, as the tongue is clean. The face is flushed, the urine scanty and high coloured, the pulse is full or depressed.

On the second day, after a sleepless night, the patients are restless and agitated. The nausea and vomiting have abated, traces of delirium begin to show themselves, a roaring in the ears takes place, with impairment of the sense of hearing. The vertigo greatly increases, the patients stagger if they attempt to walk, sometimes they appear to sleep, but are in a state of great internal agitation and excitement. The mucous membranes of the throat are gorged and the chest is oppressed, but pains in the back, loins, and calves of the legs are sources of the greatest distress.

These symptoms continue to increase during the third day. There is disinclination to the least exertion, and even to speak is an effort.

On the fourth day extraordinary redness appears on the surface of the body, which is the exanthema. Hildenbrand considers that a condition similar to that of the skin may exist in the membrane of the lungs and in the inner lining of the intestinal canal. The rash to which he applies the epithet "purpurous" is especially seen in those parts of the body which are kept warmest, as the back, the chest, and a portion of the limbs nearest the trunk. After the eruption of the rash, the disease continues without any particular change for the remaining three days of the first week.

In this, the inflammatory period, there is no real debility; the pulse is frequent, strong, more or less sharp, but never really weak: there is a diminution of muscular power, there is general turgescence with redness of the skin, with a disposition to epistaxis; the tongue is white and moist, the skin damp, the bowels sluggish. The fever has no apparent remission; and on the authority of Lind and Milman, as well as on his own, Hildenbrand asserts that blood now drawn exhibits a buffy coat. This inflammatory period typhus shares with all infectious diseases. It is connected as in other exanthemata with a rash; the appearance of which is always preceded by the febrile disturbance. In this as in others disorders of the same class, the excitement of the system has not the stamp of simple inflammatory fever, and it is often associated with symptoms referable to the chest and abdomen which in many cases render the diagnosis extremely difficult. This complication shows itself by an inflammatory state of the throat or of the trachea, with oppression

of the chest and consequently by pneumonia. The eye is often congested in this period.

According to our distinguished author the gastric symptoms are consecutive upon the catarrhal.

In this stage there are none of those signs of weakness which so essentially characterise this disease in the advanced periods. Exacerbations take place on the third and on the seventh day.

5. The next period of the disease is the nervous. Towards the end of the seventh day an extremely remarkable aggravation of symptoms takes place, additional features present themselves, there is an accession of febrile heat, the proper exanthematous and inflammatory symptoms disappear and other phenomena succeed, and occupy in their course the second week.

The nervous system is now principally affected, and the weakness becomes real which before was only deceitful and false. The fever itself continues, accompanied however by a new train of symptoms precisely opposed to the former ones; the pulse becomes more feeble and in general slower, the tongue dry, the skin dry and burning, the urine pale and clear, the evacuations by stool more frequent and liquid. There is dulness of hearing with delirium, loss of sensibility, muscular irritation, tremblings, subsultus, and convulsions. These symptoms, says M. de Hildenbrand, are proofs of an affection of the nervous system, but they must not always be referred solely to debility; and he states among other reasons for coming to this conclusion, the fact that the disease is comparatively little under the influence of medicine, that a slightly depleting plan is not unsuccessful, and that the pulse in this state is not without power.

It is now that the disease is most infectious.

In this stage he observes that although the exanthema disappears yet the petechiæ remain: they indeed increase, and if they have not previously appeared they now show themselves, though less numerous than in the earlier stage. The intellectual faculties are greatly deranged, the patient is perfectly indifferent to all impressions and ceases to call for drink although the tongue is dry, the throat parched, and the cavities of the mouth and nose are black. The oppression of the chest is relieved although the breathing continues hurried; the cough ceases but hiccup comes on; the stools are fetid; and pains in the bowels from inflammation of the intestines are invariably present at this period of typhus. The urine is more abundant than is common in acute fever, it is clear and rarely deposits a sediment, and is retained in the bladder by spasm of the sphincter. The pulse varies much in number, force, and fulness, it is frequently slow and has a peculiarity difficult to describe, which Hildenbrand says is rather a constant dilatation than a beat: and there is a sort of irregular agitation of the blood in the artery which he compares to the movement of boiling water, or to the impulse of certain aneurisms.

In this period, the second week of the disease, the affection of the

brain and the nervous system furnish the prominent symptoms. The hearing and all the other external senses are blunted. The character of the delirium is peculiar, being singularly incoherent, ideas are furnished by the brain with wonderful rapidity, but there is always some one prevailing notion. It is a dream without sleep, and the mind seems entirely occupied with its own creation, and totally insensible to all external objects. Stupor reigns throughout; hence the propriety of the term typhus.

6. The next period he calls that of the crisis. The disorder which has now continued a fortnight is found to diminish without the intervention of art or the employment of any special remedy. A change in the state of the patient takes place, which in the regular and moderate cases of typhus brings with it the cure, provided no obstacles arise. According to Hildenbrand, at the close of the thirteenth day the heat of the skin increases, and a peculiar comatose state comes on; nevertheless, he adds, towards the middle of this day or on the fourteenth, the skin evinces a disposition to become moist, the exhalants begin to act. This is the crisis. Some patients are a second time subject to hemorrhage affording relief to the head, the nostrils discharge and the tongue becomes moist, cleaner, and red at the tip. A salutary perspiration breaks out, which has a peculiar odour; the urine passes freely, and there is a disposition to diarrhœa, which in this case is beneficial to the patient.

7. The next period is that of remission. The time of the crisis, like that of the invasion, only lasts for a few hours. When the crisis is favourable, the remission of the disease is obvious in twelve hours; but the transition to health is not immediate, a series of processes are to be undergone which dissipate the remains of the disorder and thus by degrees bring about the cure. The first active symptom which abates is the delirium. The patients awake as it were from a dream or from a fit of intoxication; some instantaneously recover their consciousness and are astonished at their situation; the memory however will be found to have suffered much, and passed events are completely forgotten or only recalled with great effort. The indifference testified in the earlier periods subsides, the eye and look become more lively and free, notice is now taken of passing events. All the natural feelings are restored, but the hearing remains dull and noise in the head continues. The muscular system gains power and the pulse becomes calm, and even, and free, but its feebleness continues: the heat of skin is moderate and uniform, the thirst abates, appetite and sleep are restored, though the functions are not performed as in health, and the patients complain much of their weakness. Any exertion produces fatigue; the mind is weak; there is great irritability, and a disposition to perspiration and costiveness. The head still feels heavy, but every day removes some of these ailments, the last of which is the dullness of hearing. A period of seven days is thus occupied.

8. The eighth period is that of convalescence. All the phenomena of the disease are dissipated during the period of remission; still the strength is not firmly re-established, the patient is emaciated, the skin loose, the flesh soft and flabby, desquamation of the cuticle takes place, the hair falls off, and the nails are renewed. The appetite returns, nay is craving. There is usually constipation, and in women menstruation is suppressed; this secretion however is restored when the strength is regained. The period of convalescence in many cases lasts some weeks; recovery varies, being slower after this than after any other fever. Complete restoration, with exemption in some degree from the recurrence of the disease, at length takes place, and other ailments previously existing sometimes depart with it.

Such is the outline which professor Hilbenbrand has given of the disease to which he proposes to apply the term typhus. In this sketch he considers the disease as occurring in a marked but regular manner.

There are many circumstances which complicate the disorder; many irregularities in its course, which render it difficult in some cases even to identify it. Irregularities however which typhus shares with other exanthemata.

The disease offers many variations in its course, and its order is not unfrequently disturbed. The same cause may produce different phenomena in different individuals according to their age, temperament, habits, present or previous state of health, or season of the year. Anomalies may thus arise in the different periods: the irregularities however of the first or second period, according to M. de Hildenbrand, are but little perceptible; there may be some difference in the intensity of the shivering fit, it may be very severe, last an unusual time, or there may be none at all.

The most remarkable modifications take place in the inflammatory period—and are such as quite to change the aspect of the fever; the anomalies which it presents are innumerable. The inflammatory character is sometimes unusually intense: the fever at this time will put on the form of severe feverish cold without in some cases any marked local affection. Sometimes the symptoms of violent local inflammation mingle with the signs of typhus. Should the determination to the head be intense, the delirium becomes frenzy, and stupor becomes true apoplexy. The throat and the parotid glands, the lungs, the bowels, the liver, the intestines, the peritoneum, the bladder, all become the seat of acute inflammatory action.

The tendency to inflammation is indeed the great cause of the anomaly in the progress of this disorder.

The symptoms referable to the bowels are often so prominent as to deceive even the most observant.

The rash varies, sometimes it does not appear at all, or is so little developed as to escape notice; it occasionally presents itself under

the form of miliary petechiæ, and disappears in a few hours, or having been out its usual time departs without affording corresponding relief.

Instead of the inflammatory symptoms, nervous ones present themselves, as tremors, subsultus, convulsions, a dry and parched tongue; or the local inflammation changes its nature, and real weakness declares itself. The disease highly malignant may prove fatal at once, or putrid symptoms show themselves and under the influence of the general weakness the blood and circulating fluids may become extravasated both internally and externally, in the form of black petechiæ, or hemorrhage. A disposition to gangrene appears, a putrid smell is exhaled—signs which portend speedy dissolution. In this form carbuncle is sometimes seen.

The duration of the inflammatory stage has been found to vary; it is very short in some cases, in others it is prolonged beyond the ordinary period of a week and extends to the ninth or eleventh day.

Irregularities during the nervous period in some measure depend upon the preceding stage. Should inflammation, for example, have been set up in the first period it may extend into the second, in which case there will be an especial tendency to gangrene. Nervous inflammation, as Hildenbrand terms it, will be produced; this most commonly is met with in the lung, the brain, or the intestines, when it assumes the character of putrid dysentery.

The rash which usually diminishes may continue, the petechiæ put on a new aspect, or swelling of the parotids take place.

Amongst the signs of nervous debility, the most remarkable, Hildenbrand adds, are the dry, hard tongue, extreme thirst, dryness and heat of skin, a disposition to dysentery with distention of the abdomen by flatus, urgent pains in the belly, universal tremors, convulsions, delirium with the picking of the bedclothes, muttering, hiccup, cramps, paralysis, black sordes on the tongue and teeth, fetid breath, passive hemorrhage, coldness of the limbs, and clammy sweats. When these symptoms occur the fever instead of terminating on the 14th is prolonged to the 17th, 21st, or 28th day, or even longer.

Amongst the anomalies during the critical period, he notices, that the natural termination may be retarded by many circumstances, such as local inflammations, especially those of the lungs and abdomen, by debilitating causes, or by large evacuations, and that sometimes the amendment at the critical periods takes place without any obvious evacuation, either by the skin or from the bowels.

During the period of remission unusual occurrences are met with, such as stupor, delirium, unrefreshing sleep, deafness, much loss of appetite, derangement of the intestines, weakness and slowness of the pulse; or the fever, though slight, may continue. A sort of metastasis may come on and prove fatal, though not immediately. Sometimes at this period an inflammation of the throat will take place, or a fresh infection occasion relapses.

Sometimes, when the earlier periods of the disease have been regularly passed, anomalies arise during convalescence. The state like intoxication, vigilance, great weakness, exhausting perspirations, constipated bowels or irritability of temper may long remain.

Such is the description given by Professor Hildenbrand of the fever, which he clearly defines and vividly portrays. A disorder peculiar in its character, obeying the laws which regulate other contagions, and presenting phenomena which are common to other exanthemata, such as measles and scarlet fever.

The next point to be considered is whether or not the epidemics which have appeared from time to time, and have recently prevailed, ought to be classed with the disorder thus described. Those who have had an opportunity of watching the symptoms and progress of the now prevailing fever, and have had many cases under their care, will agree with me that it is impossible to deny its identity with the one described by the German professor; no leading symptom of the one is indeed wanting in the other, all the essential characteristics, all the irregularity and appalling complications, are met with. We daily recognise the suffused dusky countenance, the injected eye, the great prostration of strength, deafness, confusion of the head, rash upon the skin, tremors of the muscles, tendency to hemorrhage, disturbance of the mental faculties, and inflammation of various parts. The disorder has conformed to its prescribed course; and too many proofs amongst members of our own profession have attested its infectious nature. Some additional circumstances will be pointed out at a future time, which took place this year, and either did not occur in the epidemic of 1806, or then escaped the attention of Hildenbrand.

During the spring of last year the same fever prevailed extensively, and the cases which were then under my care accurately corresponded in all important particulars with our standard of reference. The epidemic in 1831, of which an account has already been published by the author,[1] presented all the striking features of this formidable malady.

If Dr. Armstrong's description of the typhus fever of 1817 be referred to, the symptoms of this same disease may be collected from amongst his different varieties. He notices the congested eye, the confusion of mind, the delirium, the black parched tongue, the low mutterings, the tremor of the hands, the subsultus tendinum, the watchfulness or stupor, the relaxation of the sphincter muscles, signs which enable us to recognise this disease. He takes but slight notice indeed of one important characteristic, when speaking of the symptoms, viz. the rash. He says, however, that "peculiar petechiæ show themselves upon the extremities, which are at first only few in number, and appear as if a drop of very black ink had been allowed to dry here and there upon the skin—they soon become numerous and spread over different parts of the body, and at

[1] Some Account of a Fever prevalent in 1831.

last are generally accompanied by discharges of blood from the nostrils, mouth, bladder, or bowels."[1] And later in his account he adds, "most recent writers on fever seem disposed to attribute the appearance of petechiæ to the hot regimen, and thus account for their frequency in the typhus of former times when that practice was prevalent; but though they may have been often thus produced formerly, yet this was not the case in a great many of the epidemic cases which have occurred in the metropolis, for the petechiæ in some instances appeared on the first day of the attack, and frequently on the second and the third; and it is therefore highly probable that petechiæ sometimes occur as epidemical peculiarities wholly unconnected with the mode of treatment which may be pursued; nay, this is certain in the instances above adduced. The petechiæ were sometimes so peculiarly small as to have the character of an almost *anomalous rash*, and sometimes so large and thick set as to make the skin almost as red as in the measles or scarlet fever, for the eruptions of which, indeed, I have known them occasionally mistaken."[2]

Real petechiæ could never be mistaken for measles or scarlet fever, the eruption therefore here described could not have had reference to them, but such a mistake would be very pardonable, with regard to the rash in typhus, for in some cases it is extremely difficult to distinguish it simply by the aspect of the patient. Many of the other symptoms too are analogous; there are, however, abundant means of distinction which will be hereafter pointed out.

The description by Huxham of the epidemic of 1734–5, which he calls slow or nervous, bears great analogy to that under consideration. Of this he gives us the following description in his work De Aere et Morbis Epidemicis. "Lenta adeo," he says, "et nervosa febris lento quodam invadit gressu at firmo nimis; hac quippe correpti de levi vagoque horrore; incerto quodam et errante calore intercurrente subinde; de lassitudine porro membrisque quasi fatigatis queruntur quidem, dum obambulant interim oscitantes tamen et torpidi. Accedunt mox præcordiorum oppressio, nausea, gravedo capitis, astricta tempora aut vertigo quædam. Pulsus frequens est semper, at debilis plerumque, ac inordinatus. Calor autem haud insignis excitatur unquam; at sæpe dum volæ manuum uruntur extrema frigescunt, dum caput ardet algent pedes. Obrepit indies malum, jamque loqui aut moveri piget. Ac vel inopinantes lecto affixi vix quo se habent modo exponere vellent, aut sopore nimio detenti aut vigiliis mire anxiis et fere perpetuis. Nihil poscunt interea prorsus ne vel potum. Jam tendinum subsultus adest, tremunt manus, tremit lingua quæ muco subalbido obducta, haud multum fere inarescit, nisi media solum in parte ubi fusca est. Tandem et aliena murmurant subinde et desipientia, furens tamen abest insania. Tenuem plerumque reddunt urinam,

[1] Armstrong on Typhus Fever, 3d edit. Lond. 1819, p. 117.
[2] Ibid. p. 223.

vapidi instar vini, aut cerevisiæ luridam, aliquando limpidam haud raro etiam subnigram, subinde paulo crassiorem inspersa quasi farina. Breves, inæquales et parum constantes habent sudores sæpe frigidulos et glutinosos sæpe profusos maxime, et paulo ante mortem non raro gelidos cum pulsu exili et formicante. Stragula contrectant interim, et inanes quasdam imagines prehendere tentant, jamque vox faucibus hærens, ungues digitique lividi, facies cadaverosa perpetue fere et frigide suspiria certissimam instare mortem denunciant.

"En hujus febris dira facies quam nervosam ideo nominarunt quod nervos potissimum afficere videatur lentam vero quod ad diem vicesimum primum et ultra sæpe perduret."

The leading features of the fevers which have recently prevailed are surely portrayed in this description; we perceive the great loss of strength, the confusion of the head, the stupor or vigilance, and the tremors of the hands and tongue. But he goes on still further to prove the identity, "pestifera semper est," he adds, "ubi aphthæ nigræ, petechiæ fuscæ, lividæ, atræ, aut vibices quasi, apparent. Præsertim si accedit alvus cita, plumbea, nigra, colliquans aut sudores oleosi—ubi pustulis, papulis, aut maculis cutim deturbantibus febris lenta stipata, contagiosa est ut plurimum; cùm verò exanthemata mali sunt moris vulgo (audit) maligna. Papulæ, rubræ, floridæ copiosæ aut plurimæ pustulæ miliares turgidæ, statu morbi erumpentes bona præsagiunt—salutaris nonnunquam erumpit parotis,—convalescentes frequentissime surdiscunt et sæpe habent apostemata in meatu aurium salutifera."

It is unnecessary to insist upon the identity of this disorder with that described by Hildenbrand.

On very many occasions, judges, jurymen, and others in attendance at courts of law have fallen victims to a similar pestilence; so frequently indeed have examples of this occurred that the epithet black has been applied to assizes, thus rendered unfortunately notorious. One black assize took place at Oxford in 1577. Another at Exeter in the year 1586. One at Dublin in 1776. Twice it has occurred in London, first in 1536, and again in 1750. We have but little record of these occurrences, other than as historical facts, excepting of the last. Of the black assize of London in 1750 Sir John Pringle[1] observes. "This unhappy instance is so fresh in our memories that I need not have mentioned it here, had it not been to inform such as live at a distance, or those that are to come after us. The fever[2] in the beginning had an inflammatory appearance, but that after large evacuations the pulse sank, and was not to be raised by blisters or cordials. I have more than once known a large bleeding sink the pulse and bring on a delirium: except by this last mark and the tremor of the hands, the disease is not easily to be distinguished in the beginning from any common

[1] Diseases of the Army, 2d edit. 8vo. Lond. 1753, p. 246.
[2] Ibid. p. 292.

fever. When the fever advances fast, to the ordinary symptoms are added great lassitude, nausea, pains in the back, a more constant pain and confusion in the head, and an uncommon tremor of the hands; the pulse often varies in the same day as to strength and fulness, and sooner or later sinks, and gives then certain indication of the malignity of the disease. If the sick lie warm and have had no preceding flux, the body is generally costive, but when they lie cold a diarrhœa is a common symptom. In the most cases a flux appears in the last state, when the stools are involuntary, colliquative, ichorous, or bloody, and of a cadaverous smell. The tongue is mostly dry, and without the constant care of the nurse becomes hard and black, with deep chaps. What may be particular to this," he adds, "is that sometimes the tongue will be soft and moist to the last. The drought is sometimes great, oftener moderate; in the advanced state, the breath is always offensive. Some are never delirious, but all are under a great stupor or confusion. Few retain their senses to the last, many lose them early. They rarely sleep, and unless delirious, have more of a dejected than a feverish look. The white of the eye is generally of a reddish cast, as if inflamed. All along as the pulse sinks, the delirium and tremors increase, and in proportion to its rising, the head and spirits are relieved: frequently from the very beginning he patient grows dull of hearing." He still further confirms the similarity of this fever with the one first described, by observing, "that there are *certain spots* which are the frequent but not inseparable attendants of this fever. These are," he says, "the true petechiæ," a statement however, which we may fairly doubt from his further description of the eruption; for he says that they are "sometimes of a paler red, at other times of a livid colour, and that they are small and commonly distinct, but are sometimes so confluent that at a little distance the skin looks only somewhat redder than ordinary, as if the colour was uniform; but upon a nearer inspection the interstices are seen. For the most part these spots are so little conspicuous that unless looked for attentively they may escape notice. They come thickest out on the breast and back, less on the legs and arms, and I do not remember to have seen any on the face. They sometimes appear as early as the fourth or fifth day, and at other times as late as the fourteenth. They are never critical, but only concur with other circumstances to ascertain the malignity. The nearer they approach to a purple the more ominous they are.

"The length of the fever is uncertain, the time depending upon the malignity. In the hospitals we had it running from fourteen to twenty days, but some have died or recovered after four weeks' illness.

"From the time of the sinking of the pulse till death, or a favourable crisis, there is perhaps less change from day to day than in any other fever not of the malignant kind. When the course is long, it often terminates in suppurations of the parotid or axillary glands. Many upon coming out of this fever complain of a pain in their

limbs and want of rest; and almost all of great weakness, confusion of the head, and noise in the ears."

In Sir John Pringle's account we thus find all the leading characteristics of the fever in question, and what he terms petechiæ may probably have been the rash usually seen in these cases, or perhaps a mixture of both.[1]

The description given by Dr. Rasori, of a disease prevalent in Genoa in 1799 and 1800, and which he calls "petechial fever," accurately resembles the typhus of Hildenbrand. Dr. Rasori had ample opportunities of seeing the disease, as he was, at the period alluded to, Professor of Clinical Medicine at the Civil and Military Hospital at Milan. The disorder, he observes, was indicated by pain in the head, by great weakness and pain in the limbs, by early and considerable wandering of mind, by vigilance, and by deafness. He remarks also, that the heat of the body was sometimes but little increased, that the pulse was somewhat accelerated, but did not usually exceed 100. That it singularly varied in the same individual even during the same day, that sometimes it could be felt in one hand, while it was not to be detected in the other. In some cases, he says, the pulse was imperceptible in both wrists. He notices the hemorrhagic tendency, and crowns the whole by allusion to the eruption which appeared on the skin. In the account, however, of the eruption he is obviously confused. He notices that petechiæ were present, and so commonly that he entitles the fever, petechial, but in describing the cutaneous affection he states that there were petechiæ, or *an eruption little differing from petechiæ*, or a miliary eruption, or both.[2]

Here then we have an eruptive disease, with all the genuine features of the exanthemata, not however, as we may fairly conclude belonging to any known variety, or it could not have escaped the observation of this bold and learned practitioner.

M. Louis published in 1829 his researches upon the disorder termed "gastro-enteritis, putrid, adynamic, ataxic, typhoid fever." In this account we find the description of a disease so closely resembling the fever noticed in the preceding pages, that we cannot I conceive refuse our assent to place it in the same class. M. Louis paid great attention to a number of cases which were admitted into the Hôpital de la Charité in Paris, between the years 1822 and 1827, and were under the care of M. Chomel. He gives an account of 123 cases of this disorder. Few works on any subject show more devotion to science, more care and pains in tracing symptoms and recording post mortem appearances.

M. Louis, in his general description of the symptoms, says that the disorder began with shivering, accompanied by trembling, headache, lassitude, loss of appetite, thirst, pain in the abdomen, and

[1] Gentleman's Magazine, May, 1750.

[2] Storia della Febbre petecchiale di Genova negli anni 1799 ed. 1800, terza editione, 1813.

in the larger number of the cases with liquid evacuation within the first twenty-four hours. These symptoms, he observes, indicated that the disorder had its seat in the abdomen alone. They gradually increased, others were added to them, and gave the disease its proper physiognomy. He then goes on to describe a train of symptoms which satisfy me of the identity of this disease with the one selected for reference. We find in the recital, the excessive prostration of strength, the disturbance of the brain, the ringing of the ears, the injected eye, bleeding at the nose, the eruption of a rash, rosy, lenticular mixed with sudamina, the tympanitic distention of the abdomen, the involuntary stools, the hemorrhage from the bowels, the tongue unchanged in some cases, clammy and dry, coated, cleft, red, black, or enlarged in others, put out with difficulty, and trembling when protruded. The debility, M. Louis adds, increased every day, the skin over the sacrum readily became inflamed, excoriated and gangrenous; shivering rarely took place after the commencement, except to indicate some new accession of disorder, such for instance as erysipelas. The pulse was mostly about 100, large at first, small, weak, and irregular in the course of the disease; cough when it occurred would be accompanied by ronchus and crepitation; the countenance, tumid and loaded in the beginning, lost by degrees all expression and exhibited no trace of intelligence or consciousness, or it became the fierce index of fury or wandering, according to the character of the delirium. The muscles of the lips, cheeks, and lower jaw, were observed to twitch, and similar contractions were observed in the limbs; in some cases however there would be permanent rigidity of these parts or of the neck. Death at length would arrive, sometimes unexpectedly, sometimes due to secondary lesions, or accelerated by the perforation of the intestines. He notices several varieties in the severity of the symptoms, and observes that sometimes one train, sometimes another, appeared to take the lead, and as one or another might prevail, so would the fever put on the putrid form, ataxic character, or sometimes even that of inflammatory fever. In spite, however, he adds, of the difference of aspect the affection was one and the same, indicated by one anatomical sign, a peculiar change of the glands of the mucous membrane of the elliptical patches of the small intestine. In this account, we find all the leading indications of the epidemic described by Professor Hildenbrand, and that variety appears to be described in which the gastric symptoms prevailed; this will appear more marked still, when the duration of the disease, its contagious nature, and the organic lesions in typhus come under consideration.

It would profit as little to trace the disease much further as to question the propriety of the term typhus, which has at any rate antiquity for its sanction. It was originally employed by Hippocrates not to indicate a specific disease but as including a great variety of fevers. In his chapter concerning internal diseases, he gives us five varieties of typhu The first variety, he says, appears

in summer time, during the period when Sirius presides, and arises from excess of bile in the system. He speaks of pain in the bowels as a leading symptom and asserts that this fever is completed in a period from seven to fourteen days. Another typhus occurs at all seasons, from too great fluidity, as he thinks, of the body, which is prone to swell; the disorder, he says, intermits and the patients live twenty-four days. Another typhus originates from putrefied bile mixing with the blood. Another typhus takes place in the apple season, when people have eaten too much fruit with a thin rind; it is marked by profluvium of the belly; patients suffering under it are troubled with diarrhœa, which continues for several days, and then they are well. Another typhus of Hippocrates is certainly marked by symptoms more decidedly referable to the head, by delirium and picking of the bed clothes; but his account by no means corresponds accurately with the disorder under consideration, and it is obvious that under the term typhus very dissimilar maladies are arranged. The actual meaning of the word is stupor.[1]

It will not be necessary to dwell longer upon the proof of identity between all the diseases above enumerated. Many of the symptoms are found in all fevers, others again are common to what are called putrid or pestilential fevers, and a third class are peculiar to the disease in question. Each of these orders of symptoms will claim some notice at my hands, with the hope of being able to arrive at a general conclusion from particular propositions.

Typhus fever, in common with all others, exhibits in the first place all the phenomena incident to symptomatic or secondary fevers. The constitutional febrile symptoms which arise in consequence of local inflammation so closely resemble those of idiopathic fever that they cannot often be distinguished, except by the history of the case or by the local affection.[2]

It occasionally puts on those signs which are supposed to denote putrescence; such for instance as extreme prostration, great tendency to gangrene, fetor of the evacuations, cadaverous smell of the whole body, copious discharges of blood, and a rapid tendency to decomposition after death. Scarlet fever as is well known not unfrequently puts on this appalling character. Putrid symptoms may also come on during the progress of the measles or small-pox. These signs therefore may be called accidental, and are common to a variety of specific diseases.

It has in the third place some other symptoms essentially its own; these are rash upon the skin, the power of spreading by infection, and the certain period of duration.

The Rash.—To entitle typhus to rank amongst the exanthemata and to distinguish it from the other varieties of that class we must look to the character of the eruption and to the time of its appearance. Rayer defines the exanthemata to be inflammatory diseases of the

[1] Hippocratis opera, vol. ii. p. 246.
[2] Thomson on Inflammation, 8vo. Edinb. ed. 1813, p. 103.

skin, characterised externally at their acme or highest degree of developement by the morbid accumulation of blood in a point, a district, or the entire surface of the integuments.[1] In general, however, exanthemata are considered to be cutaneous eruptions, accompanied by fever, arising from contagion, and liable to occur but once during life. All the authors who have written expressly on typhus, or who have described those diseases which appear allied to it, mention the circumstance of a rash; sometimes vaguely, sometimes erroneously.

Huxham it will be recollected says "Papulæ rubræ floridæ copiosæ aut plurimæ pustulæ miliares turgidæ statu morbi erumpentes bona præsagiunt." Sir John Pringle observes that "there are certain spots which are the frequent attendants of this fever of a paler red and so confluent that at a little distance the skin only looks somewhat redder than ordinary." Rasori states "there is eruption of petechiæ, or an eruption little differing from petechiæ." Armstrong says that "the petechiæ were sometimes so peculiarly small as to have the character of an almost anomalous rash, and sometimes so large and thick set as to make the skin almost as red as in measles or scarlet fever; for the eruptions of which indeed" he adds "I have known them occasionally mistaken."[2]

According to M. Chomel[3] there is an eruption in the majority of cases. Mons. Louis takes notice of the "taches roses lenticulaires" as a frequent occurrence in the disorder described by him. Bateman remarks that in a few cases an efflorescence made its appearance resembling measles, and this is considered by Rayer to be a variety of roseola.[4] Sauvages describes the rash in typhus, but objects for the following reasons to place that fever amongst the exanthemata. He says "differt a morbis exanthematicis ex eo quod exanthemata in typho, vel a regimine calidiori inducantur, vel non nisi in morbi statu superveniant, eaque ut plurimum sint maculæ, non vero tumores, etiamsi parotides quandoque subnascantur: in exanthematicis vero eruptiones miliares, variolosæ, robeolosæ, bubonaceæ, &c. ante morbi statum etiam prorumpunt."[5]

There are many circumstances which throw obstacles in the way of obtaining accurate information respecting the rash in typhus. Patients frequently delay their application to hospitals for several weeks, so that in one class of cases it will have disappeared before the disorder came under notice. In another class it will probably be overlooked, for it is often so slight as to escape any but an experienced eye. Then again it will not be perceptible on the chest or arms, where it is usually expected to be found. On one occasion where it had been sought for in vain on the front part of the body, it was perceived abundantly on the back, which was accidentally

[1] Rayer, Treatise on Diseases of the Skin, p. 57.
[2] Armstrong on Typhus, p. 223.
[3] Leçons de Clinique Medicale, p. 7.
[4] Rayer on Diseases of the Skin, 2d. Ed. Lond. 1835, p. 193.
[5] Sauvages Nosolog. Method. oct. Amstel. 1763, vol. ii. p. 252.

examined, owing to the necessity of confining the patient in a straight waistcoat. Little can be learned on this subject, from the patients themselves; when asked if they have any eruption on the skin, they almost invariably say no, and even should it be fully out, are seldom aware of it. Treatment may in some degree interfere with its appearance. Many cases have occurred in which no rash could be detected, after the adoption of active measures at the commencement, especially if emetics were administered on the first symptoms declaring themselves. Independent however of all these circumstances, it appears in the larger number of cases. According to Louis it is seen in two out of three, nay more, in fifteen out of sixteen; Chomel says, it appeared in thirty-two out of fifty-four. By reference to my note book, I find that the rash is recorded in 70 out of 100 cases promiscuously taken, no mention being made of it in the remaining 30: again, out of 100, all of whom had the rash, it was present in 86 on their admission, and showed itself subsequently in the rest.

The rash then may fairly be considered as one of the characteristics of this fever, and the assertion of Sauvages, that it arises from an over-exciting treatment is sufficiently contradicted by modern experience. For the rash in this as in other eruptive fevers seems to be exhibited more fully, since the general introduction of a cooling regimen has been adopted and sedulously enforced. To Sauvages' objection against placing typhus among the exanthemata, on account of the lateness at which the rash appears, we may oppose the fact that it is constantly perceived on the third or fourth day.

The eruption itself is of a red colour, the shades of which are various, in some cases bright and vivid, more generally however, dusky, and undertoned: if the rash is fully developed the cuticle is slightly elevated, and when the vessels are very turgid the eruption is perceptible to the touch. It is most commonly found on the chest, trunk and limbs; sometimes on the face, and was noticed in a recent case to have reached and occupied the scalp; nor is it confined to the outer surface of the body, but extends itself to the lips and lining membrane of the mouth.

It appears in spots or patches circular in form, and varying in size from the diameter of a pin's head to that of a pea. No itching attends its presence on the skin, nor is desquamation of the cuticle an ordinary consequence. From the appearance of the patients in the eruptive stage, the term spotted is not inappropriate to this fever; and its existence in London in 1750 may be presumed from the fact that the bills of mortality for that year, besides the ordinary eruptive disorders as measles, small-pox and scarlatina, announce as prevalent "malignant fever, spotted fever, and purples." We learn from the same source that in the above mentioned year the mortality from these causes was very considerable; 1229 persons died from small-pox, 321 from measles, and 4294 from fever. In the following year the number of deaths were proportionately small, 998 from small-pox, 31 from measles, and 3219 from fever. A decrease in the

number of deaths from these causes alone of nearly sixteen hundred.

The duration of the rash in typhus, according to M. Chomel, is from three to four days; should any mottling of the skin appear after this period he attributes it to a fresh eruption; and remarks that the exanthema disappears occasionally on the second day after it has shown itself. It may here be observed that in some cases, when the rash could not be perceived, but in which it was deemed advisable to bleed the patient, and a ligature was applied for that purpose to the arm, the eruption appeared below the tape. Acting upon this idea, I have at other times been able to exhibit it by artificial congestion of the vessels.

A few cases may now be quoted in illustration of the different periods at which the rash appears; of its occasional absence or unusual prolongation.

CASE I.—*In which the eruption was visible on the third day.*

George Ward, aged 11, was admitted into St. Bartholomew's Hospital on the 14th of July, 1837. The account obtained of his illness was that he had been seized two days previously with shivering and pain in the head, followed by ordinary febrile symptoms. On the next day he had in addition some pain in the chest. When taken into the hospital he complained much of headache, his pulse was frequent, his skin was hot, dry and spotted with a rash, appearing in points or small patches of a dusky red colour. Upon auscultation some crepitation was detected in the chest. But short notes were taken of this case as the symptoms were comparatively mild, and the disease yielded readily to treatment. He was discharged well on the 1st of August.

CASE II.—*Showing the leading features of the epidemic of* 1831, *in which the rash appeared on the fourth day.*

Richard Barclay, aged 23, was attacked on the 20th of May, 1831, by headache and nausea; his tongue was clean, his bowels confined. On the third day he was reported as extremely weak, and vomited on taking food; on the fourth day a copious eruption of dusky red spots appeared on the trunk and limbs. As he was unable to pass his water, it was necessary to draw it off by the catheter. He continued for some time in a low weak state, his tongue became dry and brown, but he had no delirium, and was pronounced convalescent on the 8th of June.

This case was watched from the commencement. The patient had been admitted into the seaman's hospital for an affection of the trachea, of which he had quite recovered, and was engaged as nurse to attend the fever patients on board. He had acted for a fortnight in this capacity when he was taken ill as described.

CASE III.—*Exhibiting the usual symptoms of the epidemic of 1838 in a more aggravated degree, and in which the rash appeared on the fourth day.*

Martha Chandley, aged 48, one of the nurses at St. Bartholomew's Hospital, and lately occupied in attending to fever cases, was attacked on the 2d of March, 1838, with alternations of chills and flushes, with great languor and lassitude, and with pain in the head and limbs. She continued at her work two days, when she was herself obliged to become a patient. When the case was taken on the third day her aspect was heavy, her countenance rather pale, there was no suffusion of the eyes but a slight intolerance of light, she felt sick, but had not vomited, there was no tenderness of the abdomen, she complained chiefly of pain in the head; there was but little increase of temperature; the chest sounded well on percussion, no unnatural sound could be detected on auscultation, but the air did not enter freely into the base of the right lung.

Next day the temperature of the body had increased, the countenance was anxious, the face flushed, the tongue dry and brown, with intense thirst. A spotted eruption was very evident on the face, neck, and other parts of the body. Percussion and auscultation detected nothing morbid in the chest.

The following night was passed without sleep, she was continually moaning or talking incoherently, her tongue continued dry and brown, her teeth became coated with a dark secretion, she brought up some mucus tinged with blood, crepitation was heard at the base of the right lung, and there was some slight tenderness of the abdomen.

The report of the next day, the 7th of March, was that she had had no sleep, she moaned and rambled all night, her evacuations all passed in the bed, her lips and teeth were covered with sordes, she was very thirsty, and her expectoration contained some blood. She remained for several days in a state of apparent insensibility; when roused, however, she gave collected but reluctant answers to questions, and quickly again sank into forgetfulness. Her tongue continued dry and black, her pulse above 100 and very weak, her evacuations passing unconsciously. The abdomen then became tympanitic.

On the 12th however she was reported to have had rather a better night, and her aspect was improved; and her tongue began to be a little moist at the edges.

From this time she continued to mend, and was eventually discharged quite well.

CASE IV.—*In which the rash appeared on the fifth day.*

William Brittle, aged 19, was received into St. Bartholomew's Hospital on the 2d of June, 1837. He had been seized the day before with cold chills and other signs of fever. On admission his

eyes were suffused, his pulse accelerated, he was deaf, with pain in all his limbs and abdomen. On the 4th the last symptom was relieved. On the 5th, he complained of some sore throat; his chest and arms were spotted with a dusky rash. On the 10th he was delirious. On the 12th he was much better, and on the 18th had recovered from his attack of fever, but was not discharged till the 4th of July, owing to the continuance of debility.

CASE V.—*In which the rash was perceived on the skin on the sixth day.*

Eliza Simpson, aged 21, a servant, admitted into St. Bartholomew's Hospital for hysteria on the 8th of February, 1838, became feverish on the 26th, with pain in the head, tongue furred and dry, pulse quick and full, urine high-coloured.

27th. Perspiring, tongue furred, moist, pulse quick, much pain in the head.

28th. Still complains of pain in the head.

March 1st. Perspiring, tongue moist, pain in the head continues, some inflammation of the posterior fauces and throat.

3d. But little sleep, pain in the head diminished, subsultus of the tendons of the hand, tremors of the lower jaw.

4th. Night very restless, skin spotted with a rash.

5th. Better, eruption vivid, less nervous excitement and confusion of the head.

7th. Much better, slept composedly last night, skin cool and moist, less appearance of the rash, diarrhœa.

14th. From the time of the last report she continued to improve rapidly, and is now convalescent though very weak.

In this case the treatment may have had something to do with the delay; an emetic was administered on the first appearance of the symptoms, this provoked vomiting, which was urgent, and continued the greater part of the night. In several other instances where the fever commenced in the hospital and the same treatment was adopted, no rash could be discovered.

CASE VI.—*In which all the signs of typhus were present upon admission into the Seaman's Hospital except the rash, this however appeared as soon as the patient was in bed.*

Richard Tracey, aged 18, admitted on board the floating hospital on the 18th of April, 1831. The words of the case as taken at the time are "giddiness, pains in the head and limbs, tongue dry and brown, skin hot, pulse 120 small and weak, bronchitis, skin covered with red spots, in a constant state of tremor. Ill six days. There was no appearance of rash when he was admitted in the early part of the afternoon, but in the evening when seen in bed, he was covered with it."

April 19. Next day, still great pain in the head, with giddiness and flushed face.

22. Strabismus.

23. Eyes recovered their proper axis of vision.

30. Had rigors this afternoon. Crepitation on the left side of the chest.

May 15th. Discharged well.

CASE VII.—*In which no eruption appeared.*

Catherine Mandy, aged 25, a servant, was an inmate of St. Bartholomew's Hospital for a purely local affection when the beds were almost all filled with fever cases. After having been in three weeks she had an attack of diarrhœa, this was on the 4th of January.

5th. She was feverish, with violent pain in the head and loins, with great thirst and dryness of the skin.

6th. The febrile symptoms diminished yesterday after the action of an emetic, but she passed a restless night; tongue clean and moist, severe pain in the head, pulse 90, rather full.

8th. Very restless last night, violent pain in the head.

9th. Pain in the head was relieved by leeches, but she slept badly; face less flushed, pulse 124, feeble, there is no rash on the skin.

10th. Pale and anxious, tongue moist and less furred, skin cooler, troubled with a short irritating cough, pain in the epigastrium with relaxation of the bowels, pulse 120.

11th. Passed a bad night, nevertheless is better, cough still troublesome, but there is no injury in the chest appreciable by auscultation or percussion, tongue moist and clean.

12th. Passed a better night, pulse weak and small, 100, bowels confined, no rash on the skin.

13th. Tongue dry, pulse 130.

14th. Flushed and feverish last night, better to-day, tongue moist.

The rest of the notes refer to slight appearances of amendment, and on the 22d she was pronounced convalescent.

This patient was suffering from an irritable tumour growing from the mucous membrane of the urethra; her case was surgical, but as she had been some short time in my ward before the real cause of her ailment was detected, she begged to be allowed to remain.

The eruption is not unfrequently prolonged; of this a case may be quoted.

CASE VIII.—*In which the traces of the rash had not entirely disappeared a month after the first attack.*

Jemima Halley, aged 35, was admitted into St. Bartholomew's Hospital on the 26th of February, 1838. Her state on admission was as follows: countenance flushed, teeth covered with sordes, skin dry and hot, thickly spotted with the rash, tongue dry and

brown in the centre, severe pain in the head and bowels, cough, without expectoration, respirations twenty, ronchus with large crepitation throughout both lungs posteriorly. She has been ill twelve days. Feb. 27, passed a bad night, rash very vivid; 28, wandering during the night, skin cooler, the rash still existing. March 4, evacuations are passed involuntarily, the rash is less distinct; 7, improving, sleeps quietly at night, skin less distinctly marked; 14, the rash on the skin has almost disappeared.

This patient was convalescent at the time that some traces of the affection of the skin were still visible. The cases are generally severe in which this retardation occurs, and it seems to be often occasioned by some deep seated mischief.

The rash then may appear at various periods, it may be prolonged some weeks, or it may not appear at all, and I have seen it recede after having been out for a few hours only. We are at no loss for analogous effects in other exanthematous disorders. If M. Rayer's work should be consulted, it will there appear that the eruption in measles will sometimes show itself earlier than usual; for instance on the third day, and even sooner.[1] The same author gives us examples on the other hand of its retardation to the fifth or sixth.

During the epidemic measles of 1800 several children were attacked with morbillary fever without eruption.[2] M. Rayer adds that he is unable to state whether these morbillary catarrhs, as he terms measles without the rash, are infectious or not.

The disappearance of the eruption in measles on the second day is by no means uncommon, arising either from exposure to cold, from the employment of purgatives,[3] or from causes which cannot be ascertained; and practitioners well know the urgent constitutional symptoms which then are liable to occur.

Scarlet fever exhibits the same phenomena, the efflorescence in the malignant form may, according to M. Rayer, "appear and disappear once and again."[4] It is well known that the eruption in this form is later in its appearance.[5] It moreover may be prolonged or renewed; Rayer observes that after the decline of the rash in simple scarlatina a remarkable phenomenon presents itself, which he calls "reversio," a febrile paroxysm occurs, and then the skin is covered anew with a rash composed of red spots less numerous than the first and of smaller size.[6] The rash again may be prolonged beyond the ordinary period of a week.[7]

It cannot be necessary to quote examples of the absence of the rash in scarlet fever, we have in truth as a variety "scarlatina sine exanthemate:" and very many references are made by M. Rayer to such occurrences. The scarlet fever of 1766, observed by Fothergill and Huxham, was of this character; so was that of 1788, which occurred in Buckinghamshire.[8]

In truth there is no peculiarity or anomaly in typhus which may not be found exemplified in scarlet fever, measles, or small-pox.

[1] Rayer, p. 145. [2] 150. [3] 156. [4] 169. [5] 146. [6] 167. [7] 168. [8] 170.

The rash cannot be mistaken for variola, as it never assumes a pustular form; from roseola it is to be distinguished by the following signs, the patch is smaller, it appears later, and there is no itching.

It cannot be confounded with simple erythema, as that is not accompanied by fever; but from measles it is not in its mere aspect to be distinguished, and indeed it may fairly be conjectured that that epidemic, which Sydenham describes as being measles of an anomalous and malignant form, was real typhus. The measles, he says, of 1674, deviated from rule, did not preserve their type, the eruption came out irregularly, was often confined to the neck and shoulders, the bran-like desquamation did not result, peripneumonia more frequently took place, and in some cases the fever would last 14 days and more."[1]

This disease differs from measles in many respects; its duration is longer, it is wanting in the usual precursory affection of the eyes and sneezing; the rash is more irregular in form, it does not pass progressively from the head or trunk to the extremities, and those who have had the measles are not free from an attack of this disorder.

The rash of typhus again differs from scarlatina in being less vivid, the redness is not so diffused, there is more tendency to moisture on the skin, there is usually no sore throat, nor is typhus in my experience ever followed by anasarca.

Monsieur Chomel, in alluding to the typhoid malady, says that sudamina appear more frequently in this than in any other fever. They are little vesicles, transparent, of a quarter of a line in diameter, and often escape observation, as they are not seen if viewed perpendicularly to their axes. They are usually met with at the end of the second week.[2]

In other cases papulæ appear mixed with the other eruption. Both the occurrence of sudamina and papulæ are common in the other exanthemata, for example in scarlatina.

THE POWER OF SPREADING BY INFECTION.

Our next object of inquiry, and an important one in establishing the specific nature of typhus, is whether or not it is capable of being communicated by infection. Into this I shall now enter, and shall at the same time allude to some other points which can be most conveniently treated of here, such as the supposed cause of the disease, its protecting influence against future attacks, and the age most liable to it. In this country the majority of practitioners will allow that it may thus extend itself. Still many even here may be sceptical, or may not have been able to satisfy themselves on this point; and on the continent great doubts are entertained upon it. The

[1] Sydenhami Opera, p. 232. [2] Chomel, 25.

prevailing opinion indeed abroad is very much against any such property in the disease in question. We are informed by M. Chomel, that in France the majority of physicians are opposed to the doctrine of infection, and that not above one in two hundred considers that typhus is capable of being thus extended.[1] He himself admits, doubtingly, its infectious nature, and adds, "if it be so it is only in a slight degree, and from a concurrence of circumstances not yet determined." It is undoubtedly a matter of great difficulty to prove whether the spread of an epidemic arises from one atmospheric cause, affecting all simultaneously, or whether in a crowded community the poison is propagated from one individual to another. This can only be inferred by the circumstances and the mode of its diffusion.

Dr. Gooch, in speaking of the tests of infection, remarks, "First, that those persons are most liable to the disease who approach the infected, and that their risk is in proportion to the nearness of the approach. Secondly, those who avoid an interview with persons infected, generally or always escape it, and that in proportion to the care with which they avoid them. Thirdly, an infectious disease is communicable by inoculation."

Accident alone would give us the opportunity of observing the effects of typhus by inoculation upon the human frame, but we can make the experiment on animals, and we learn some interesting particulars on this head from M. Gendrin. He ascertained, 1st. that healthy human blood occasions no injury when thrown into the veins of animals. He then injected the blood of persons labouring under various specific fevers, and found that a fatal result ensued. Applied to the cellular tissue, similar consequences followed. An ounce of blood drawn from a person labouring under putrid fever was injected into the cellular membrane of the groin of a cat; copious vomiting, dyspnœa, with a small frequent irregular pulse, a dry brown tongue, great prostration and slight convulsion followed, and death took place in seven hours.[2]

Hence we must confine our observations to the two other tests, viz. what occurs when persons are secluded, and by tracing accurately the spread of a disorder by communication with, or on approach of the sick.

Instances of the appearance of infectious diseases occasionally take place, under circumstances which render it difficult to conceive how they could by possibility have arisen, and make it problematical whether by any seclusion the subtle agent of infection can be effectually shut out. Quarantine may diminish the chances of the extension of any infectious disease, but cannot absolutely preclude its entrance. It may completely put a stop to the spread of such maladies as are communicable by the touch alone, but cannot arrest the passage of those which are conveyed from place to place by the atmosphere. And it is by no means difficult to

[1] Leçons de Clin. Med. p. 318, 339, 539.
[2] Andral, Precis d'Anat. Pat. vol. i, p. 538.

imagine that such a subtle agent as infectious matter can be readily conveyed through the air, when we see grosser particles of matter, manifest to our senses, thus transported to enormous distances. During the volcanic irruption at Sumbawa in 1815,[1] ashes were carried by the wind in such quantity to the island of Java, a distance of 300 miles, that the darkness during the day was more profound than ever had been witnessed in the most obscure night. Other examples of impurities borne by the atmosphere to places remote from their source might easily be quoted. Dr. Prout, in his Bridgewater Treatise, alludes to the share which the atmosphere has in disseminating disease, and gives us various instances of foreign matters being suspended or dissolved in this fluid. Passing by the overcharge of moisture and electricity, indicated by the gloom, the mists, the halos of a stormy sky, the restlessness and clamour of animals, we find that minute plants of a red colour have been so thickly present in the air that descending with rain or snow they have given rise to the popular notion of showers of blood. Dr. Prout also gives an account of the remarkable haze which appeared in 1782, which was of a pale blue colour, and occasionally yielded a strong and peculiar odour, during the continuance of which, epidemic diseases prevailed;[2] the same author noticed an alteration in the weight of the atmosphere before the appearance of cholera in 1832, and explains it by the supposition that a gaseous body considerably heavier than the air occupied its place, and this body he considers as a variety of malaria. Not vegetables only but minute animals are said to be thus occasionally suspended. Should this be true, we can understand that by the decomposition of such bodies, disorders may be generated. My object, however, is not to find a source of disease, but to show how easily and how far infectious matters may be conveyed by this medium. The following incidents may serve as practical illustrations of the above assertion. Sir Gilbert Blane mentions that an isolated case of scarlet fever occurred amongst a ship's crew at sea, long separated from intercourse with the land. Again the children at the Foundling Hospital have no communication with others, from one year's end to another; yet measles, and small-pox appear from time to time among them. The most complete example however of the insidious means by which contagious effluvia may find admission, is related by Dr. Heberden, an example which shows that all our attempts to exclude it may be set at defiance, and all our endeavours to prevent it by separation be frustrated. For it were perhaps scarcely conceivable to effect greater seclusion, than takes place when a person is imprisoned in solitary confinement; yet we are informed by the accomplished physician last alluded to, that a man who had been several months in the penitentiary at Millbank, having no commu-

[1] On the Connection of the Physical Sciences, by Mary Somerville. London, 2d ed. p. 272.

[2] Bridgewater Treatise on Digestion, pp. 346, 355.

nication personally, by letter, or by clothing ,with any one except the persons belonging to the establishment, who were all free from small-pox,' was attacked by that complaint, which however at the time was prevalent in the neighbourhood.

Our chief reasoning then must be founded on the facts which we observe when persons in health approach those who are infected, or when disease appears in a healthy situation, immediately upon the arrival of an infected person; hence in the first place we should look for the propagation of a disease to those in attendance on the sick, and should expect to find that nurses and medical practitioners, would be the greatest sufferers. The events of this year have too conclusively verified this expectation, as many deaths are reported to have taken place from this cause among members of our profession. No fewer than five[2] can readily be summed up, and others without doubt might be added to the number. Many practitioners were attacked but survived. Numerous examples of infection may be found amongst those employed in the study of their profession, and here, alas! diligence was requited by pestilence, and assiduity led the way to destruction. At St. Bartholomew's Hospital alone six pupils were attacked during the last session, and about as many during the one immediately preceding.

Among the nurses in attendance upon the sick in that establishment infection was almost universal. Two of the superintendents in one of the medical wards, in quick succession, were attacked and died. Others were seized, but recovered. Of the whole number of the inferior nurses who were taken ill, I am not exactly certain, but seven were under my own charge. Still it may be argued that in all these cases the same cause was in operation, that patients and nurses contracted the disease from a common source, and not from each other. Numberless instances however might be quoted in which the fever appeared indisputably to be conveyed by the sick. One only I will relate, which satisfied me that the epidemic fever of 1831 was infectious, where in three distinct situations the disease broke out and spread after the arrival of infected persons.

During the winter of 1830 and the spring of 1831, great distress prevailed among the lower classes of maritime men. For the alleviation of which a refuge was established on the north side of the river Thames. It was immediately beset with supplicants for relief, several hundreds of whom obtained nightly food and lodging. By the rules of this institution the inmates were dismissed on the

[1] Med. Gaz. vol. x. p. 172.

[2] Mr. Cook, Dr. Fergus, Dr. John Home, Dr. Johnson, Dr. Sims. Times for April 9th, May 12th, July 21st. Last year, Mr. Staples, apothecary to the Aldersgate street Dispensary, and his assistant, were attacked in turn, and died; a third in succession took the fever, and very narrowly escaped sharing their fate. Mr. Stocker, apothecary to Guy's Hospital, and the assistant apothecary to St. Thomas, were seized with this disorder, but recovered. Mr. Berkley, House Surgeon to St. George's, fell a victim to its ravages.

following morning. It was soon discovered that many were too ill from fever to quit the refuge at the appointed time. In order to separate the healthy from the sick, a room adjoining that in which the merely destitute were received, was converted into an infirmary. Crowds still flocked to this refuge, which now was pregnant with evil. Many of those who were quite well on their admission, were next day too weak to stand, with all the precursory indications of fever, which it may be presumed they had contracted by infection. The number of the sick increased to such an extent that it was necessary to remove them to other institutions, and they were sent by boat loads at the time to the floating hospital. Almost all the beds in the medical wards were rapidly occupied by persons infected with a fever, which obviously was specific in its nature. Now although previously to the arrival of these individuals there were cases of fever on board, yet they were of an ordinary character, and did not present the peculiarities exhibited by those received from the refuge. The disorder thus imported soon spread itself over the ship, patients admitted for surgical and other complaints were attacked, the residents on board suffered from fever of a similar kind, and the immediate attendants were severely visited. There were seven nurses employed in the medical wards, whose duty it was to attend on the fever patients, and who returned home when off duty to their families on the south bank of the river. Six of these nurses, were attacked with fever of this new type, which a third time made its appearance in a fresh situation, viz. in their houses on shore. The symptoms were the same in each of these different places, and the disease in all was to be distinguished by the characteristic rash. Other circumstances too, both positive and negative, may be mentioned which confirm my belief that this disease spread by infection. All the attendants at the refuge, both medical and others, were more or less severely affected by it. Again there was no such disorder in vessels moored near the floating hospital. Nor was there any such fever on the south bank of the river before it appeared in the hospital ship, as I was informed by Dr. Sutton, the physician to the Kent Dispensary, and by other practitioners in the neighbourhood.

The records of the fever hospital afford a melancholy proof of the increased risk to which medical officers and others are exposed who are attached to institutions solely appropriated to the reception of fever patients.

In Dr. Tweedie's Clinical Illustrations of Fever, it is stated that "every physician, with the exception of Dr. Bateman, who has been connected with the fever hospital has been attacked with fever during his attendance, and three out of eight physicians have died. The resident medical officers, matrons, porters, domestic servants, and nurses, have one and all invariably been the subjects of fever, and the laundresses whose duty it is to wash the patients' clothes are so invariably and frequently attacked that few women will undertake this duty. The resident medical officer was attacked with fever,

and it became necessary to appoint some one to perform his duties; the first person who thus officiated took the precaution of sleeping at home, yet his duties were soon interrupted by an attack of fever which confined him a considerable time. He was succeeded by an individual in robust health, a disbeliever in the doctrine of contagion. He performed his duty only ten days, when symptoms of severe fever appeared.[1]

This statement furnishes us with a powerful argument against the propriety of appropriating hospitals exclusively to the reception of fever cases; such an atmosphere must be injurious to the patients themselves, and militate against their recovery as well as endanger the safety of the attendants.

Some doubts entered my mind as to the discretion of alluding to the circumstances stated by Morgagni, that the dead body of a person who has died of fever is capable of spreading the disease. But it behoves all to endeavour to establish truth, and especially does it concern those who are connected with our medical schools to investigate a subject which, if true, would involve in a great measure the safety of pupils who resort to our theatres for anatomical knowledge. The facts, however, observed in the dissecting rooms attached to St. Bartholomew's Hospital go a great way to refute the assertion of Morgagni. He says, "I have not so many observations to communicate on this subject of fever as on others, because there is some hazard in dissecting persons who die from this cause. This, indeed, has been disputed by authors, but it is unquestionable that fatal consequences have resulted in this theatre; a young man of a robust habit had partly dissected the body of a man who died of petechial fever, he was seized with the same affection and died. In 1717 Vulpius opened the body of a woman who died of apoplexy, which came on during the progress of malignant fever, and I stood by to demonstrate the situation of the viscera to the auditors. The body was just cold, and though when the abdomen was opened no very unpleasant odour ascended, nor was there any disease except an entangled state of the intestines, yet I immediately felt an unusual degree of languor, bordering upon syncopy, and we had scarcely returned home when both of us were seized with febrile shuddering and feverishness, succeeded by a hot skin."[2]

The facts observed at St. Bartholomew's Hospital which bear upon this assertion are the following. During the last session, seventeen bodies of persons who had died of fever were submitted to dissection. Upon an average eight pupils were engaged with each. There were one hundred and thirty-six thus occupied. Six of the whole body of the students were attacked with the fever, but of these six, two only devoted their time to dissection. We cannot therefore consider that the assertion of Morgagni is borne out by experience, as with us the proportion of those attacked was only

[1] Cyclop. Prac. Med. vol. i. p. 400.
[2] Cook's Morgagni, vol. ii. p. 592.

one in sixty-eight, and this calculation is made without including many pupils who were lookers on, and therefore exposed to infection if there was any; and without counting the bodies of persons reported to have died of fever, and which were sent to the rooms from various sources. The two gentlemen who were taken ill while dissecting, were moreover exposed to the infection of the living body in the wards of the hospital, and the other four were in close and constant attendance on the patients, as they were acting at the period of their seizure as clinical clerks.

The legitimate inference to be drawn from these facts is, that typhus, readily communicable during life, ceases to be so to any serious degree afterwards.

CAUSE OF TYPHUS.

From the mode of extension when once produced, our ideas naturally pass to the causes of its production. The notion is generally entertained that under certain conditions the poison of typhus can always be generated. Most authors consider that simple exposure to a close atmosphere is sufficient for this purpose. Such an opinion has been expressed by Dr. Thomson in his valuable lectures on inflammation, and is laid down with all the clearness of that admirable writer; he observes that typhus fever, small-pox, measles, hooping cough, scarlatina and hospital gangrene, are communicated, not only by actual contact, but also by the transmission of an effluvium from the fomes or original source of infection through the medium of the air. Some of these diseases are never generated de novo—others again as typhus fever and probably hospital gangrene, seem capable of being produced in certain circumstances where the individuals affected by them have not been exposed to infection.[1]

Hildenbrand in speaking of original typhus says, that the miasma which produces this can arise at all times, that air overcharged with human exhalations is the cause: and that then it has the power of self extension, and adds, that every fever, whether intermittent, continued, inflammatory, gastric, exanthematic, nervous or putrid, may pass to the state of typhus. An opinion also entertained, it will be remembered, by Dr. Copland and the experienced author of the article Fever, in the Cyclopædia of Practical Medicine.

Sir Gilbert Blane says, that air contaminated by foul and stagnant exhalations, particularly those from the living human body, is the ascertained cause of typhus fever, known also by the name of the jail, hospital, and ship fever, which has been a more grievous and general source of sickness and mortality in the navy than even the scurvy. This is also the notion of Sir John Pringle, and is repeatedly expressed in his works—"When the hospitals of an army" he says "are crowded with sick, or when the distempers are of a

[1] Thomson's Lectures, p. 487.

putrid nature, or at any time when the air is confined, especially in hot weather, a fever of a malignant kind is produced, one which is very mortal. I have observed the same sort to arise in full and crowded barracks, and in transport ships when filled beyond a due number, and detained long by contrary winds, or when the men have been detained long under close hatches in stormy weather. As soon as I became acquainted," he continues, "with this fever in the hospitals abroad, I suspected it to be the same with what is called here the jail distemper. This disorder is incident to every place ill-aired and kept dirty, that is filled with animal steams from foul or diseased bodies."[1] He seems to consider that any contamination of the atmosphere may produce it, and on one occasion referred its origin to the fetor of a mortified limb.

This disorder has often been considered as originating in jails, and certainly, as I have already mentioned, this fever has often broken out amongst those whose duty calls them into crowded courts, and has proved extensively fatal. The custom still kept up of strewing the courts with various herbs is founded no doubt upon this belief, though much more efficient preventives might be suggested. Lord Bacon says, "the most pernicious infection next to the plague is the smell of the jail when prisoners have been long and close and nastily kept, whereof we have had in our time experience twice or thrice, when both the judges that sat upon the jail, and numbers of those that attended the business, or were present, sickened upon it and died. Therefore," he observes, "it were good wisdom, that in such cases the jail were aired before they be brought forth."[2] The black assize of 1750 was commonly attributed to this cause; for we find that on the 22d of May, 1750,[3] a "messenger from Lord Chief Justice Lee attended the Court of Aldermen to acquaint them of the necessity of new regulations for Newgate Jail, or that it would be dangerous for persons to attend the business of the sessions at the Old Bailey. To the message was annexed a list of twenty persons that were present at the last sessions, and who had since died, as thought, from the noisome stench of the prisoners."

It has been observed, however, that upon several of these occasions, no particular disorder has appeared among the prisoners themselves, so that it is by no means clear that the disease arose from them; and the simple fact of a fever breaking out amongst officers or others attending the court, will not prove that it was caused by any one class of persons then present. The situation might certainly have something to do with its extension, inasmuch as a large number of persons of all ranks is collected together on such occasions, some of whom no doubt would be infected, if there should happen to be at the time any epidemic disease among the community. There was no such disorder amongst the prisoners at

[1] Sir John Pringle, p. 287.
[2] Bacon's Works, London. 8vo. vol. ii. p. 49, 1803.
[3] Gentleman's Magazine, 1750.

Oxford when the black assize was held there in 1577,[1] on which occasion judges, gentry, and almost all who were present perished to the number of three hundred; the persons in the jail alone, we are told, were not injured by it. Passing over the improbability of prisoners giving rise to a disease under which they did not themselves labour, it appears that a malignant fever was at the time prevalent in Oxford, to which we are told that "two hundred more persons of note fell victims, besides numbers of lower degree." Again we are informed that in 1750,[1] when the two judges, the lord mayor, one of the aldermen, one sheriff, two or three of the counsel, several of the jury and above forty more died, no uncommon sickness was observed among the prisoners who came to the bar or were in Newgate. Now it seems clear that a very severe fever, if not this very disorder, was then prevalent in London, for in the Old England Journal for June 2d, 1750, in allusion to the mortality amongst the persons attending the Old Bailey, we find this statement: "If we should allow that the mortality was the effect only of the jail distemper, yet it can't be denied that there is a very malignant fever so rife about the town as to have carried off a great many people in a short time. The town is filled with consternation, many families are retired into the country, and near 1200 houses empty."

That fever can be produced by unhealthy exhalations from the animal body, as well as from decaying vegetable matter, few will be willing to deny. It has been established that injury results from the inhalations of an atmosphere loaded with poisonous gases, such as sulphuretted and carburetted hydrogen, and carbonic acid. Majendie indeed has indisputably[2] proved that animal matter in a state of putrefaction, inhaled or injected into the blood, will produce death with what are called putrid symptoms; but the question is, whether they produce the exanthematous disease designated typhus, and whether, when typhus breaks out in retreating armies, or those harassed by defeat and ill-furnished with provisions, it is always spontaneously produced. Such assertions seem far too general and sweeping. That vitiated air, bad food, and all debilitating causes will predispose the system to receive infection—that the influence of such causes will lead to the extension of any disease propagated by such infection, no one will think of denying, but very many striking instances may be quoted in opposition to the idea that such causes are alone capable of producing an infectious malady; a fact, indeed, well proved by Dr. Elliotson, who observes when speaking of typhus, that the greatest filth and closeness will not originate the disease. He reminds us that the Kamschadales live for seven months continuously in holes under ground, crowded together in the most disgusting state of filth, and devour in a state of putrefaction their provisions, which are kept in the same apartment with themselves; yet this people does not suffer from typhus. The same may be said

[1] Gentleman's Magazine, 1750, p. 235.
[2] Gentleman's Magazine, May, 1750, p. 235. [3] Journ. de Physiol.

of Greenlanders, Esquimaux and Russians, yet without the occurrence of putrid diseases or fever.[1] Dr. Elliotson goes on to quote Dr. Lind, who remarks that in the crowded slave ships during their voyage across the Atlantic, no infection appears, yet they are crammed even to suffocation. He notices the well-known instance of the black hole in Calcutta, where 123 persons out of 146 died, yet that no fever resulted. He multiplies examples illustrative of the same fact in the prisons of Venice, of Naples, of St. Petersburg, and of Moscow, where vitiated air, close confinement and depressing feelings conspired to injure the health, but failed to produce any specific disease. Thus we find that typhus fever is not present on numerous occasions when all its supposed causes are in operation. Sir Gilbert Blane notices an interesting fact, namely, that it prevailed on board the Diamond upon a cruise in the West Indies,[2] when none of the circumstances, as he himself remarks, were present which commonly produce it. All then that we can strictly infer is, that debility will predispose to the disease, but as it exists in those previously in robust health, and as when debilitating causes are present it is not always occasioned, we must look for some active, special and specific virus. The germ of this disorder will not, I believe, be often wanting; for in some of its various forms it seems to be almost always in activity in some portion or other of the world, and amongst all civilised communities of whose disorders we have any accurate account. And when we consider how readily the poison may be conveyed either by the atmosphere, or goods, and the minute particles which may excite the disorder in those susceptible of its influence, we may more properly consider the disease as extended by a virus in actual operation, than suppose it to be recently generated on every fresh outbreak; and in allusion to the supposed origin in the jail when it proved so fatal in 1750, there are more reasons to believe that it originated with the community where it was, than with the prisoners where it was not. Having been once produced, it may of course be so again; entirely new diseases may for any thing that we can conjecture, be generated; but seeing as we do the great conformity of the symptoms of many disorders, and that they preserve their type for ages, it is more simple and more consistent with analogy to consider that typhus depends upon a certain definite poison, which is always more or less in operation, than to suppose it generated anew by crowding, on the occasions referred to; occasions, be it observed, which have occurred thousands of times and passed off without any such consequence.

Dr. Cheyne refers to a mental emotion as the cause of a fever which is described in the Cyclopædia of Practical Medicine, as of not unfrequent occurrence, but somewhat peculiar form.[3] This

[1] Medical Gazette, vol. x. p. 146.
[2] Sir Gilbert Blane, p. 216.
[3] Dublin Hospital Reports, vol. iv.—Cyclopædia Prac. Med. p. 194.

certainly bears the aspect of typhus fever, the symptoms of which developed themselves at the moment of a powerful mental impression—perhaps were hastened by it; for we cannot imagine that they would be occasioned by any such cause; and the circumstance is referred to rather with the view of speaking of the importance generally attached to the supposed cause of a malady. Fatigue, privations, and cold, have a long catalogue of ills attributed to them which they help indeed to propagate, but only indirectly by the debility which they occasion.

It is impossible to avoid alluding to the opinions of M. Broussais and M. Louis on the cause and origin of typhus. Both these distinguished pathologists consider an alteration of the mucous membranes to be the cause of the symptoms. The great point of dispute between them is with reference to the portion of the lining membrane of the intestinal canal which is primarily affected. M. Broussais defines typhus to be a gastro-enteritis of such intensity as to produce the modification of the cerebro-spinal system, which occasions the group of typhoid symptoms.[1] The great prostration he considers indicates excess of irritation transmitted to the brain.

The cause of typhus, he asserts to be an alteration of the mucous membrane of the intestinal canal at its upper portion, every thing announcing the irritation of the stomach at the commencement of the disease.[2] This, he says, he has shown to be inflammation, and that he can prevent it reaching the typhoid point; he extends his theory to all those fevers called essential, which, with him, are nothing but gastro-enteritis. He maintains that, in many of the cases related by M. Louis, the disease began in the stomach, and not in the small intestines; and he considers that a brown tongue, black secretion on the lips, a dusky colour of the skin, with or without petechiæ, and miliary eruption, prostration of muscular force, somnolency or delirium of various kinds, convulsive movements of the lips, arms and whole body, are the symptoms of gastro-enteritis.[3] The head symptoms, he maintains, arise not from increased flow of blood, but from consecutive irritation. The brain may however become inflamed; but he adds, that he is sure to discover inflammation of the intestinal canal in all essential fevers, and that gastritis exists at their commencement.[4]

Valuable as are the observations of this distinguished pathologist, upon the consequences of inflammation occurring in different portions of the intestinal canal, yet, as I shall afterwards show, all the constitutional symptoms which he considers to be the consequence of inflammation of the intestinal canal may, and often do, exist without the occurrence of that morbid change.

M. Louis, on the other hand, claims for the small intestines priority of lesion in typhus; and maintains that in this portion of

[1] Broussais sur l'Anat. Pathol. du Doct. Louis. 448.
[2] Broussais Examen de Doct. Med. Paris, 1834, tom. 4. p. 457.
[3] Examen. 425. [4] 426.

the alimentary canal those morbid changes are to be found which constitute the essence of the disease; to this I shall again refer in alluding to the alterations of structure discovered in post mortem observations.

IMMUNITY FROM A SECOND ATTACK.

It would be a strong point in favour of the specific nature of typhus, if I could show that after one attack the system was free from any recurrence: no prospect however of complete immunity can be held out to those who have already suffered from this fever. Hildenbrand considers that for a certain time[1] the disease is not liable to recur, but that this protection does not last during the whole life: and records a case which proved fatal in the last of three attacks which followed one another in rapid succession. A very distinguished member of our profession has suffered on seven distinct occasions, and another has had three attacks, as I have been informed on good authority.

These occurrences are not however conclusive against placing typhus amongst the exanthemata. For exceptions to the protective power of a first attack are common both in measles, scarlet fever, and small-pox, and examples will probably multiply as our knowledge becomes more perfect and our diagnosis more precise.

A passage from M. Rayer may be quoted to this effect. "Tozetti, Schack, de Haen and Meza inform us that they have seen measles affecting the same individual again and again. Genovese states that during the continuance of the universally prevalent measles of 1787, he had examined 46 persons, children as well as adults, affected with measles, although they had already gone through the disease some years before. Duboscq had occasion to treat several children in 1777, whom he had attended in 1773." And M. Rayer adds, "since the publication of the first edition of the present work, I have seen three remarkable cases of the recurrence of measles."[2]

Dr. Baillie gives an account of five children, whom he twice attended for measles.[3] The first attack occurred in May, the second in November, so that all the circumstances were quite fresh in his memory, and he pronounces the symptoms to have been on each occasion well marked.

Every one must be acquainted with examples of a second attack of small-pox. I knew one instance in which it occurred three times, and the late Dr. Maton met with a case in which the system seemed to derive no protecting power from the repeated attacks of small-pox; a lady, the mother of a large family, always exhibited undoubted symptoms of the disorder when her children were inoculated, and this took place on seven separate occasions.

While we are yet uncertain how far one attack of typhus may be a protection against a second, it appears that the prevailing notions

[1] P. 147. [2] On Diseases of the Skin, p. 148.
[3] Works of Dr. Baillie, p. 78, vol. i.

of the future immunity after an attack of measles and small-pox are too positive, and scarlet fever appears less of a prophylactic than either.

IMMUNITY FROM AGE.

It is convenient to allude here to the supposed immunity afforded by age in typhus; M. Chomel says,[1] it has been well proved that typhus never occurs in aged persons. When, he adds, typhoid symptoms do occur in old age, they are due to inflammation of internal organs, and not to typhus; because, the peculiar change of glands is never seen, and he observes further that old age is an effectual security against typhus;[2] he goes on to state that it occurs usually from 18 to 30, very rarely after 40, and that no case has been met with after 55, that children under 10 are rarely affected, and that from 20 to 25 is the age most susceptible. M. Chomel adds, that young persons but rarely perish. M. Louis goes further and states that the extremes of age are 13 and 35,[3] never 40.

It may be conjectured that the reason why M. Louis and M. Chomel have formed the conclusion that children are incapable of receiving this disease, is the fact that in them the disorder is much modified, and although the leading symptoms are well marked, yet they have it much more mildly, and the bowels are hardly ever affected. This mildness of the disease in children has been noticed both by Dr. Percival, and by Dr. Bateman.

In the year 1831 children were noticed to suffer little. In the epidemic of 1586[4] we are told that every one who was attacked died within 40 hours, except women and children. I subjoin a few cases which appear to throw some doubt as to the period of life considered by these high authorities to confer exemption from a recurrence of this complaint.

Case IX.—*Of a child three years old.*

Mary Donnaway, aged 3 years, was admitted into St. Bartholomew's Hospital on the 22d June, 1837, with fever, her father being at the time a patient with the same disease. She had been suddenly attacked on the 20th with vomiting, and pain in the head, succeeded by febrile symptoms, with loss of appetite and languor. When admitted, her countenance was heavy, she had much pain in the head, constipated bowels, and a hot and dry skin; the pulse was 134, the respiration 44 in a minute; but no affection of the chest could be detected by auscultation.

23. Skin hot and dry; no eruption.

24. Less pain in the head, pulse 150, no cough, but a slight ronchus was diffused over both lungs.

25. Slept well in the night, a spotted rash very distinct.

[1] Chomel, 304.
[2] Ibid 305, 311, 427, 427.
[3] Louis, tom. ii. p. 428.
[4] Sir John Pringle.

26. More fretful, pulse 148.
28. Skin cool, pulse 120, tongue moist and furred.
29. Appetite returning, pulse 112.
Next report there was no ailment.

Case X.—*Of a child three years old.*

Julia Higgins, aged 3 years, was admitted into St. Bartholomew's Hospital on the 14th of September, 1837. When brought into the ward she had the ordinary signs of fever, not however in any great degree. She was covered with a spotted rash, which appeared, as the mother informed me, on the sixth day of her illness, and had been out two days. The chief of the early symptoms had been pain in the head, with constipated bowels. The case proceeded rapidly and favourably, and she was discharged well a week after her admission.

No patient under three years of age has been admitted into the hospital labouring under typhus; very young children may be less susceptible; still it may be supposed from the following statement that infancy is not absolutely exempt. The mother of a boy admitted into St. Bartholomew's Hospital with all the characteristic signs of typhus, informed me that she had had ten children, that she had recently lost her husband with the same fever as that under which her son was then labouring, that nine of her children had caught it, and amongst them the youngest, seven months old; she said that the infant had a great deal of fever, accompanied by fits, but that it ultimately recovered.

Case XI.—*Of a man 53 years of age.*

J—— J——, aged 53, formerly in good circumstances, was admitted into St. Bartholomew's Hospital August 9, 1838. He had been ill seven days. The symptoms on admission were the following: flushed face, skin hot and dry, dotted with petechiæ, tongue dry, brown, and tremulous, bowels confined, pulse 112 full, respiration 24, eyes suffused, pain in the head. He was reported to have had a rash on his skin. The remark on the 10th was that he had rambled much during the night. On the 11th he complained greatly of his head, and talked incoherently, his pulse was irregular and unequal, respiration 30; a great deal of twitching of the muscles, evacuations passed in bed. He improved in some respects, losing in a great degree the tremors of the muscles, but some cause not clearly definable retarded his convalescence. On the 24th some sore throat came on, with increased vascularity at the back of the fauces, which was followed by erysipelas. This gradually involved the whole face, the greater portion of the head and neck, there was great puffiness of the eyelids, and swelling beneath the jaw on the right side. He continued very delirious. The erysipelas reached its height in about a week, and on the 3d of September it had nearly

left the face. Some matter was discharged from the right eyelid, but a hard swelling remained in the situation of the submaxillary gland, tongue clean, and getting moist.

This case, after the formation of the matter, advanced favourably, and recovery might confidently have been anticipated when secondary lesion of the lungs came on, which proved fatal.

A CERTAIN PERIOD OF DURATION.

Another argument in support of the specific nature of typhus may be derived from the length of time occupied by the disease in its progress. The average duration of the epidemic in 1821 was a little beyond 20 days. Sir John Pringle says that the disorder of 1750 lasted three weeks. M. Chomel divides the time requisite for the full development of the disease into three periods, each of which comprises a week, and remarks that the majority of the cases tended to amelioration from the 17th to the 20th day.[1] Dr. Bateman[2] observes, that the epidemic disease usually goes on to the third week. M. Louis considers the duration of the disease described by him to be 25 days, but the great frequency of abdominal complication in the cases under his care may perhaps explain a little delay in their recovery. He observes that the disorder occupied a space from eight to forty days, and remarks that in those who died, the characteristic symptoms ceased some time before death; and that in those who recovered, there was a remarkable rapidity of amelioration. So common is it for this complaint to run its course in a definite time, that the familiar appellation of the one-and-twenty day fever has been applied to it. Very cursory observations of typhus fever will satisfy all that there are peculiar changes at certain periods. Signs of amendment are indicated no less by the general aspect and improvement in the symptoms, than by the feelings of the patients, who will often express themselves as confident of recovery when the change is favourable, as they were inclined to despond in the earlier stages. A relapse in my experience is a very rare occurrence, and when amendment once commences, it usually is progressive and uninterrupted.

Hildenbrand says that the disease lasts 14 days, but very many cases which I have seen clearly prove to me that it may terminate at a still earlier period. All the essential processes may indeed be gone through within a week; and should they be prolonged to the third week it by no means follows as a necessary consequence that typhoid symptoms, as they are called, should be exhibited. The following instances may serve as examples.

[1] Chomel, p. 44. [2] On Epidemic Disease, p. 31.

CASE XII.—*In which all symptoms of fever were at an end within a week.*

John Moore, aged 22, was admitted into the Seaman's Hospital on the 20th of May, 1831. When he presented himself his aspect was dull and heavy, he complained of headache and pain in all the limbs. His skin was covered with a spotted rash, and he had the ordinary febrile symptoms under which he had been labouring for two days. He was brought directly from the asylum for the destitute, where the fever was prevalent. On the 23d he was reported nearly well, and on the 26th weakness alone remained.

CASE XIII.—*With rash, fever subsiding in a week.*

James Bent, aged 23, was received into the Seaman's Hospital on the 18th of March, 1831. He had been ill five days, was feverish, pulse 108, skin hot and dry, and mottled with a rash in small distinct round patches.

No further note is taken of this case, as it was slight, until the 22d, when fever was reported to have subsided, and the appetite to have returned, and the week after the patient was discharged quite well.

CASE XIV.—*In which the symptoms terminated in three weeks without any blackness of the tongue, subsultus tendinum or low delirium.*

James Forecast, aged 18, a weaver, was admitted into St. Bartholomew's Hospital on the 28th of December, 1837. A week previously he had been attacked with shivering and great loss of strength. He stated that he had been attending on his father and mother, both of whom had been ill with fever. When taken in his eyes were suffused with redness, his skin was dusky and spotted with a rash, his pulse was very feeble and 96, he had no appetite, his bowels had been confined for two days. His tongue was moist and furred in the centre. He did not complain of his head, he had no pain in the abdomen, nor in the chest, but his respirations were 36 in the minute, and there was some slight sibilus detected by auscultation. No urgent symptoms came on, and on the 19th day from the commencement of his illness he was declared convalescent.

These cases are quoted with a view of showing the termination of typhus at different periods, and its simplest form. The symptoms in them all were mild, still they may be considered as exhibiting those features which are essential to the disease.

Many cases presented themselves during the prevalence of typhus, still slighter in degree, and occupying even a less extended period, but in which no eruption appeared, and which therefore could not be positively pronounced to be the disorder now under considera-

tion; little doubt however can be entertained that they depended upon the same cause, and were slighter effects of the same virus. In such cases we may consider that the disease was not fully developed. A few examples may be cited in corroboration of this opinion, and as showing some of the different aspects which typhus may assume.

CASE XV.—*Occurring during the prevalence of epidemic typhus in* 1831, *in which the usual symptoms of the commencement of the disease were present, but subsided within a week, no rash being visible.*

George Main, aged 25, had been in one of the asylums for the destitute, where fever was prevalent, and was admitted into the Seaman's Hospital on the 2d of April, 1831. He had frequent rigors, with pain in the head, back, and limbs, his sleep at night was disturbed, his skin was somewhat warmer than natural, but his pulse was quiet, and there was morbid appearance on the tongue. He had been ill two days. The fever quickly subsided, and on the 6th he was pronounced convalescent.

CASE XVI.—*Occurring during the prevalence of epidemic typhus.*

John Clarke, on admission into the Seaman's Hospital, March 4th, 1831, stated that he had been for some time in the asylum for the destitute. He complained of frequent chills, with pain in the limbs, and cough. His tongue was clean, pulse 70, weak, skin cool, bowels loose. The headache continued for a few days, with confusion of intellect and slowness in answering questions; after which all completely subsided in a short time. He was declared convalescent on the 8th of March.

These are some of a vast number of instances which, from the general outline of the symptoms, and from the circumstances under which they occurred, justify the inference that they arose from some specific cause. The disturbance of the head, the character of the pulse, the state of the tongue, and the condition of the skin, were not such as would be produced by the accession of simple fever: but such as might arise from the modified virus of some specific disorder, such as typhus.

In referring to the histories of other exanthemata similar occurrences are met with. Dr. Rush observes, in his Medical Inquiries and Observations, that during the raging of the scarlatina anginosa in 1783 at Philadelphia, many hundred persons suffered from sore throat, without any other symptoms of indisposition, general or local.[1]

During the prevalence of measles, slighter symptoms arise in some cases, in which the chest is affected, but no eruption appears

[1] Willan, 347.

on the skin. We may thus explain the early termination of typhus, by supposing that the natural processes are checked in their course, or that the ordinary actions are interfered with, either by some natural cause or by treatment.

The inferences which may be drawn from the examples already given are:

That typhus may cease at certain stages or periods of its course, and exhibit comparatively mild symptoms; that the constitutional effects may be apparent; and that the rash may be distinct so as clearly to identify it; yet that there may be no blackness of teeth or lips, no muttering delirium, no tremors of the limbs, no subsultus tendinum nor local inflammation.

It cannot be necessary for me to cite instances showing that these are common symptoms of the disease, the descriptions which I here give of it by Hildenbrand and others, as well as the cases which have been already related, sufficiently testify to them; but there are still further complications of a serious nature which deserve consideration. Of these occurrences an example or two may be cited, such as of hemorrhage, erysipelas, abscesses, or suppuration and gangrene. The opportunity will afterwards be afforded me of making a few remarks concerning these phenomena, and of noticing some further peculiarities of this fever, such as the character of inflammation set up during its progress, the state of the pulse, and of the nervous system.

Hemorrhage may take place either beneath the skin, from mucous or serous surfaces, and even in muscular structure. When beneath the skin, it assumes the form of vibices or petechiæ; which sometimes present themselves in conjunction with the rash, at other times appear as it were instead of it.

The following cases will serve as examples.

Case XVII.—*Petechiæ and rash intermixed.*

Stephen Berwick, aged 15, an errand boy, was admitted into St. Bartholomew's Hospital on the 12th of April, 1838, his countenance was dusky, his eye suffused, his skin thickly sprinkled with a rash on the trunk and extremities, intermixed with small petechiæ; he complained of headache, bad cough, with sonorous ronchus in the chest, his pulse was 130, and his bowels were constipated. He was seized with headache and rigors in the commencement, and stated that the rash appeared on the 5th day of his illness. These symptoms were succeeded by pain in the abdomen, muttering, a tremulous condition of the limbs, dryness of the tongue, and great disinclination to move, but they all finally subsided, and he was discharged well on the 11th of May.

CASE XVIII.—*Typhus with the eruption of petechiæ on the third day—no rash.*

Angelo Cercan, aged 21, was sent from the asylum for the destitute to the Seaman's Hospital on the 30th of March, 1831, with headache, pain all over him, tongue furred and moist; he had been ill three days, and was covered with petechiæ.

31. Headache gone.

April 8. Convalescent.

CASE XIX.—*With petechiæ appearing on the third day—no rash.*

George Platt, aged 17, was received into the Seaman's Hospital on the 23d of April, 1831, with a flushed face, pain in the head and limbs, weakness, loss of appetite, his lower limbs covered with small petechiæ, his bowels confined, he had been ill three days. On the 24th his bowels were much relaxed. On the 25th he was better, but had a peculiar wildness in his look. On the 27th he was reported delirious, and still flushed in the face. On the 30th he was deaf. On the 3d of May he was better, and on the 17th he was well except that he continued deaf, and that there was some alteration and strangeness in his manner of speaking.

CASE XX.—*In which petechiæ came on in the second week.*

Sarah Smith, aged 40, a nurse at St. Bartholomew's Hospital, was attacked by fever on the 20th of June, 1837. The disease commenced with alternate chills and flushes, followed by pain in the head, back, and limbs; on the sixth day of her illness the rash appeared, at which time she was placed under my charge; her symptoms at that time were the following: great prostration of strength, suffusion of the conjunctiva, heaviness of the countenance, skin hot and dry, the tongue dry and furred, pulse 104 and weak, tremors of the limbs, and cough, but no morbid sounds could be detected in the chest by auscultation: she was occasionally delirious. On the 28th she was reported to have been restless and wandering during the night, and to have become very cold at five in the morning; her headache continued, and the tremors of the limbs increased, the tongue was brown as well as dry, the pulse with less power. 29th. Petechiæ appeared on the trunk and lower extremities, she took no notice of anything, but was still sensible when roused. On the 30th she was much worse, the coma increased, her abdomen became tympanitic, the pulse scarcely perceptible, 150, and she died in the evening of this day.

Petechiæ are spoken of by most authors as common in typhus, but it should be remarked that two very different conditions of the cutaneous tissues are to be found under this head. One of them is

the effusion of blood beneath the cuticle, the other is the peculiar rash. In the Dictionnaire de Medecine, de Chirurgie, &c. under the head of Petechiæ, we find that authors have applied this term to the exanthema in typhus; but it is there also observed that this application of the word is a perversion of its right meaning.

Real petechiæ frequently do occur, and their appearance is rather formidable though far from being a fatal sign. They are in fact visible in most cases. In 1832 the cases admitted into the London Fever Hospital almost invariably presented this feature.[1] Dr. Stokes of Dublin states that out of 540 patients 368 had petechiæ. Their conversion into the rash is spoken of by some authors as a common occurrence, and we might *à priori* consider it as likely to be the case, for we should certainly expect that effusions of blood would more readily take place from injected than from other parts. But this by no means appears to be a common case, the rash and petechiæ are generally quite distinct in their situation, although they seem to be different results from the same processes. It is almost superfluous to state to medical men the difference or modes of distinction between the two. The aspect alone is generally sufficient to decide the question, or it may more certainly be settled by gentle pressure, which in the case of a rash renders the skin pale by emptying the vessels, while no pressure can obliterate the marks of effused blood which causes the appearance of petechiæ.

It is well known that the eruption of small-pox, scarlet fever and measles, occasionally assumes what is termed the petechial form, in which case there is a tendency to effusion beneath the epidermis, when this occurs in small-pox, instead of matter blood is poured out into the pustule, which when universal throughout the body, almost invariably precedes a fatal result. We find then an analogous petechial state in other exanthemata, and in eruptive diseases: not so frequently perhaps as in typhus, but apparently obeying the same laws and in all probability depending upon the same cause for their production. This is one form of hemorrhage, a very constant symptom both in typhus and other epidemics. Another very frequently met with is epistaxis, so commonly indeed as to be fairly considered one of the peculiarities of this fever; and discharges of blood from all the mucous membranes, either of the lungs, bowels, kidneys or uterus, very often takes place. Hemoptysis and epistaxis are mostly seen early in the disease, while hemorrhage from the bowels comes on at a later period. Bronchitis also is constantly noticed in typhus, and the secretion poured forth from the inflamed membrane often contains streaks of blood, even in cases where the disorder does not require either general or local depletion. Immediately connected with this subject is the fact which I noticed in the fever of 1831, that the hemorrhage from leech bites was extremely profuse, and often very difficult to be stopped; a fact important to be borne in mind practically, as the

[1] Cyclop. of Practical Medicine, vol. ii. 176.

bleeding from a few leeches will very frequently greatly depress the system, and more blood will escape than was at first intended, or rendered desirable by the state of the patient.

Hemorrhage is perpetually ascribed to an altered condition of the blood, and there are good grounds for believing, as will hereafter be shown, that it is indeed one of its causes, but in passing I would advert to the fact, that hemorrhage takes place at one of two distinct periods, the first on or about the third day from the attack, the second upon the fourteenth day or later. It may also be mentioned, although perhaps a little out of place, that the condition of the vessels themselves in typhus and other eruptive fevers deserves more attention and notice than it has as yet received, admitting, as all are ready to do, that the vascular system performs a most essential part in all fevers and inflammations. It will be suggested in the following pages, that a morbid condition may be produced in this important tissue, fully capable of giving rise to many of the phenomena of this fever.

That the blood itself is in some cases so constituted as to have a tendency to escape from the vessels, owing to a deficiency of certain natural changes is proved by the fact, that in the morbus cæruleus there is with other signs of diminished vigour in the system a tendency to hemorrhage even to a fatal extent.[1]

It would be an interesting subject of inquiry to ascertain whether there is any unhealthy character in the blood of those persons in whom this disposition appears constitutional, or whether that unfortunate tendency arises from the state of the vessels alone. To the last cause Mr. Mayo refers this idiosyncrasy, and in speaking of this subject observes, "that there are persons in danger of bleeding to death from the slightest wound, and that cases are on record where the extraction of a tooth has been fatal. In such instances," he remarks, "the minute vessels instead of closing continue open," and also that "this tendency results from the indisposition of the small vessels to contract: they want or have less than usual of their proper irritability."[2]

A few examples may be given of the different forms of hemorrhage in typhus.

Case XXI.—*Exhibiting signs of the epidemic of* 1831, *with profuse epistaxis.*

James Taylor was received on board the Seaman's Hospital on the 19th of March, 1831. His tongue was dry and brown, his pulse was weak, and intermitted every third beat, he complained of severe pain in the head, and was constantly delirious, he had pain in the abdomen, increased by pressure. The skin was hot, and the legs and thighs were mottled with large blue patches of ecchymosis, intermixed with smaller red spots. There was profuse hemorrhage

[1] Muller, 140. [2] Mayo, Outlines of Pathology. Lond. 1836, p. 144.

from the left nostril, which had continued for two days. This bleeding was restrained by cold and other means, but returned on the 20th, the day after his admission. It then became necessary to plug the nostril, which plan was effectual in stopping the flow of blood, all the bad signs, however, continued, the pulse being feeble and intermittent; he gradually sank, and died on the 4th of April.

CASE XXII.—*In which there was copious discharge of blood from the bowels.*

William Hatfield, aged 32, was admitted into the Seaman's Hospital on the 5th of March, 1831. From the confused state of his intellect, few particulars of his illness previous to his admission could be learned. But it was ascertained that he had had fever for five days. His aspect was heavy and dull, his manner was agitated, as of one labouring under alarm, yet he maintained that he ailed nothing. His skin was covered with petechiæ, and he was suffering under general febrile symptoms. Four days after his admission, he passed suddenly by stool three pints of fluid blood, on the following day a smaller quantity was evacuated. This case, however, proceeded favourably, convalescence was marked by the formation of an abscess beneath the left ear, which was the only peculiarity in its course besides the hemorrhage.

CASE XXIII.—*With hemorrhage from the uterus.*

Sarah Barrett, aged 23, married, came into St. Bartholomew's Hospital with pain in the head and abdomen, a dull heavy countenance, injected conjunctiva of the eye, confused ideas, her teeth and lips covered with sordes, great thirst, her skin spotted with a rash, constant vigilance at night, and profuse hemorrhage from the uterus: she had been ill twelve days. Her attack commenced with pain in the back and limbs, headache, and horripilation; she became heavy, drowsy, or rather she remained in a state of stupor, lying flat on the back with extreme prostration of strength, and petechiæ appeared intermingled with the rash.

The case appeared almost hopeless for some time, but a favourable change took place and she was discharged well a month after the commencement of her illness.

In several cases there has occurred hemorrhage into the structure of muscles as well as into other parts. The following case illustrates general hemorrhagic tendency combined with fever, the symptoms of which appeared to be of a typhoid character.

CASE XXIV.—*Ecchymosis of the skin, liver, spleen, lungs. Effusion of blood into the brain, the sheath of the spinal chord, and into the right pectoral muscle. Suppuration of the inguinal glands.*

John Michael, aged 16, was brought to the Seaman's Hospital on the 14th of January, 1832, in a state bordering upon insensibility; he was constantly throwing about his limbs, his face was pale, the pupil of the eye was dilated, his breathing was oppressed, he had cough with expectoration of blood, and shrank as if he felt pain when pressure was made on the abdomen; the surface of the body was covered with petechiæ. All that could be ascertained about him was that he had had fever, with great pain in the head, and that he had been delirious for a week.

He died very soon after his admission into the hospital. It was observed that the body retained its warmth twenty-four hours after death. It was covered with purple spots, which were almost entirely confined to the anterior portion of the body.

The liver was greatly enlarged and pale. The spleen was soft and larger than natural. The lungs were healthy in structure, and with the liver and spleen were dotted with petechiæ.

Blood had been effused into the left side of the brain at the lower and back part; the upper portion of the spinal chord was surrounded with blood; there was effusion of blood also into the substance of the left pectoral muscle.

The inguinal glands were enlarged and red, and when cut into yielded blood mixed with a purulent fluid.

Hemorrhage then in the various forms of ecchymosis, epistaxis, &c. is a common addition to the milder symptoms of typhus.

The question whether the alteration in the blood precedes the morbid change in the vessels will be better considered in taking a review of the different events in this fever and their order. For the present I shall only call attention to one interesting and important fact that the hemorrhage which occurs in typhus appears very nearly allied to inflammation, or in other words, that we see inflammatory action readily produced in those parts which are the seat of hemorrhage, either coexistent with it or coming on afterwards; and it seems that in many cases but slight causes are sufficient to decide the point, which of the two should be produced.

During the prevalence of the epidemic in various years, idiopathic erysipelas has been a very common and a very serious addition to other complaints in persons exposed from their situation in hospitals and elsewhere to the vicinity and infection of typhus, and so common was it in the progress of the fever during the present year, as well as during that of 1831, that no doubt could be entertained that it was essentially connected with and incident to this disorder. Dr. Bateman noticed it in the House of Recovery, and considers it an accessory disease. M. Louis observes, that shivering

rarely took place in the course of the disease except to usher in some new calamity, such as erysipelas. It seems to arise at two periods, of which one is within the first week, usurping as it were the place of the ordinary rash. It prevails at the same time as typhus, is preceded by the same symptoms, and arises amongst nurses or those in attendance upon the patients ill with that fever.

Rust considers erysipelas rather as an exanthematous fever[1] than as a simple inflammatory condition of the skin; to this M. Rayer in part accedes. It shows itself occasionally as an epidemic, and is decidedly infectious in certain forms. Its appearance frequently seems beneficial in the later stages of typhus, for on its irruption a train of anomalous symptoms will frequently at once disappear. Patients often remain in a precarious state, yet without any obvious ailment, their progress is retarded, or their convalescence checked, but all again advances when this local action has been established. Erysipelas then is met with in some instances, as an early feature, although sometimes not till the second week. It occurs in cases where there has been the rash as well as in others in which this symptom is wanting.

Cases illustrative of these remarks may readily be found.

CASE XXV.—*Erysipelas, after apparent convalescence, where there had been no rash.*

Henry Course, aged 29, was admitted on board the Seaman's Hospital, March 4th, 1831. The rough notes taken at the time describe him as "half stupid, and quite helpless, unable to stand, denies that he is ill, but says his head aches. His chest, arms, and back, are covered with large blue petechiæ. His pulse when lying down is full and soft, but in the upright posture it becomes small and weak, he maintains that his bowels are confined, but it appears that all his evacuations pass unconsciously." Two days afterwards he was described as more conscious. After another interval of two days he was still less confused, but his tongue was dry; this became moist, and he appeared to be convalescent fourteen days after his admission. Erysipelas, however, then came on, which lasted a week, but with very little constitutional disturbance. He was discharged cured on the 18th of April.

CASE XXVI.—*Erysipelas, apparently salutary.*

James Watson, aged 29, was admitted into the Seaman's Hospital, January 17th, 1831, with pain in the head, flushed face, suffused conjunctiva of the eye, and slight tenderness of the abdomen. Three days afterwards he was reported to be stupid, drowsy and deaf, his eyes were still suffused, and his face flushed. Again, in three days more, deafness, drowsiness, and stupor increased, the

[1] Gaz. Med. 4to. 1833, p. 16; 1831, p. 334. Rayer, 138.

stools were now passed involuntarily. After two days he was much better, the fever appeared to have left him. On the 12th, however, from his admission, he was not so well, the tongue became dry and brown. Erysipelas then appeared, which lasted for a week, and he was reported free from ailment on the twenty-second day after his admission.

CASE XXVII.—*Rash on the skin, with erysipelas.*

Stephen Saunderson was admitted into St. Bartholomew's Hospital on the 12th of April, 1838. If his own account was to be relied on, he had been ill with fever for a fortnight. When he presented himself his eyes were suffused, his appearance heavy and stupid, a spotted rash was abundantly out on the trunk and extremities, his tongue was white and moist, he had bronchitis on the right side, pneumonia on the left, felt faint on the loss of eight ounces of blood, which was neither cupped nor buffed, but separated into serum and crassamentum, his tongue became afterwards dry and brown, his limbs tremulous, and he was furiously delirious. Erysipelas showed itself on the face, there was a swelling of the arm above the spot where the incision for bleeding had been made in the vein, which freely discharged pus. His nights were much disturbed. The constitutional symptoms, however, gradually subsided, and he eventually though tardily recovered.

CASE XXVIII.—*Erysipelas of the face and head, the patient having attended another who had been ill with fever, but without erysipelas.*

Daniel Buttey was received into St. Bartholomew's Hospital on the 16th of July, 1838, labouring under erysipelas of the face and head. The most urgent period of the disease had passed, as there was desquamation of the cuticle of the face. The whole scalp was puffy, the tongue dry and brown, with urgent thirst, pulse 100. The history which he gave of his illness was, that he had caught a fever from a person living in the same house, whom he had been in the habit of visiting during an attack of fever, as nearly as could be ascertained of the prevailing type, but in which there had been no erysipelas; that he himself had been taken ill six weeks previously with pain in the limbs, giddiness, and thirst; that a fortnight afterwards a swelling appeared on the right side of his face, and had gradually extended itself to the head. On the 17th a collection of matter was let out from the upper eyelids. On the 18th he was delirious, during the night of the 24th matter collected in the eyelids, which were again punctured. Pneumonia was detected on the right side. On the 25th three ounces of pus were let out from beneath the scalp. On the 27th it was more distended than ever, and extensively detached from the head. On an incision being made, six ounces of matter flowed out. On the 2d of August,

three ounces of pus were let out from the scalp. The pneumonia had now advanced to hepatisation. On the 16th the lung had recovered. The patient then rapidly gained strength, and was discharged well on the 21st.

CASE XXIX.—*Erysipelas of the face in a man who had been in close attendance upon a patient suffering under this affection coming on after fever.*

Thomas Clarke, a smith, aged 23, was admitted into St. Bartholomew's Hospital on the 28th of June, 1838, for rheumatic pains, of which he had been relieved, and on the 23d of July, when about to leave, was attacked by shivering and pain in the head. On the 24th he had sore throat with difficulty of breathing and of deglutition; the posterior fauces were greatly swollen. On the 25th his face was flushed and swelled, his tongue was covered with a brownish fur, he had great difficulty in swallowing, his pulse was 130. On the 26th he was in a state of great distress from inability to get down either food or drink. Suffocation was threatened from the enormous tumefaction of the tongue and throat, he could not breathe through the nose. The swelling of the face had much increased, and the erysipelas extended to the neck. On the 27th his eyes were completely closed. The swelling reached the head, and was of a very deep and dusky red colour. On the 30th he wandered during the night, and was at times furious. On the 31st, however, there was decided amendment, he was less delirious, and the inflammation of the face had in some degree subsided. On the 3d of August he was rational, but was quite ignorant of all that had occurred during his recent illness. The cuticle of the face now peeled off, matter formed beneath the scalp, under the eyes, and beneath the chin. He continued to improve from this time, and was discharged well on the 3d of September.

This patient occupied the next bed but one to that into which Daniel Buttey, whose case was last related, was placed. Clarke was nearly well, he obligingly rendered many services to his neighbour who was ill with erysipelas, and constantly attended to him. He was attacked as will be seen by the date a week after he had been thus occupied.

The inflammation in typhus frequently terminates in suppuration. Collections of pus form in various parts, especially about the face, neck, and head, and still more frequently in the ear. The cases of erysipelas already cited will show how readily that disease put on the phlegmonous character in this fever.

CASE XXX.—*Matter discharged from both ears.*

John Hurley, aged 17, was admitted into the Seaman's Hospital on the 16th of March, 1831. He complained of headache, and described himself as seeing fire in his eyes. The conjunctiva were

suffused, the pulse 108, irregular in force, and very compressible; he had been ill six days. The report of that case is as follows:—March 17th, says his head is splitting to pieces; 22d, lies in a half stupid state, still feverish; 31st, serous discharge from the left ear; April 12th, discharge from the ear is purulent, the patient continues in a drowsy heavy state; 19th, still remains in a sleepy condition; great discharge from both ears. He finally recovered, but was not discharged until the 4th of July, in consequence of a tardy convalescence and long continued debility.

CASE XXXI.—*Large abscess beneath the integuments of the right side.*

Anne Vickery, aged 32, one of the nurses of St. Bartholomew's Hospital, was made a patient on the 30th of April, 1837, having been ill a week with pain in the head, giddiness, heat of skin, thirst, and loss of appetite, a full pulse, and a furred tongue. Cough came on, with crepitation in the left lung. A large abscess formed on the right side, from which, when opened, about a quart of pus was discharged; the left leg then began to swell. The abscess in the side filled again, and about two pints of pus were discharged by an opening; four days afterwards it was opened again, and a large quantity of pus was evacuated, the wound did not close afterwards, but continued to discharge for a week, when it healed. The patient gained strength, all bad signs gradually disappeared, and she was discharged well, but not until two months had elapsed after her admission.

CASE XXXII.—*Suppuration of the parotid gland.*

Elizabeth Anderson, aged 20, a servant, was taken into the hospital on the 1st of June, 1836. All the symptoms of the disorder were present in this case, the pain in the head and disturbance of the sensorium, the subsultus tendinum, and the injected conjunctiva; as the disorder advanced, her nights were sleepless, she was delirious, her evacuations were passed involuntarily, the chest became affected, and she spat blood. The pains in the limbs were very severe, the bowels became irritable, and crepitation was heard in the lungs. Such was her state for a fortnight after her admission, and five weeks after the commencement of her attack. She now began to improve, when the left parotid gland became hard and very painful, erysipelas then commenced in that situation, and extended over the face. On suppuration taking place in the gland, the erysipelas stopped, matter was discharged, and she entirely recovered, so as to be able to leave the house on the 5th of July.

CASE XXXIII.—*Erysipelas and abscess.*

Margaret Carney, aged 21, was admitted into St. Bartholomew's Hospital, on the 17th of November, 1837; she said that her mother

had died of fever ten weeks before, that she herself had been ill for six days, and that her attack commenced with pain in the head, chilliness and rigors, succeeded by a sense of heat and perspiration. When admitted her state was as follows—countenance flushed, look anxious, skin warm and moist, respirations frequent, teeth and lips covered with sordes, tongue dry and brown. She complained also of pain in the chest and cough, pain in the head and limbs, which were tremulous. She was very restless, and muttered frequently to herself, her pulse was 120, and easily compressible. Diarrhœa with pain in the bowels came on. In a few days more some crepitation was detected in the lungs. For ten days after her admission she continued in a very perilous state, was very weak, with a dry brown tongue, teeth covered with sordes, and tremors in the limbs. Some slight amendment was then perceptible. On the 2d of December, fourteen days after her admission, and on the twentieth day of her illness, erysipelas commenced on the left side of the nates, and in three days extended over a great portion of the trunk. On the 13th it had nearly faded. On the 27th a large abscess formed on the right side of the nates, from which a vast quantity of pus was discharged. She was declared convalescent on the 11th of February, and was eventually discharged quite well.

Case XXXIV.—*Abscess in the breast.*

Elizabeth Mallet, aged 30, was admitted into St. Bartholomew's Hospital, on the 2d of January, 1838. She stated that a fortnight previously she had been attacked by shivering, followed by ordinary febrile symptoms, which had continued up to the time of her admission; her countenance was pale, dusky, and anxious, the skin of the trunk was hot and dry, while her extremities were cold; she had nausea and giddiness, her pulse was very weak, and above 100, and her tongue was dry and chapped. She remained feverish, with occasional flushings during the remainder of the month of January. There was in her case little to call for active measures. No local inflammation could be detected, excepting in the mucous membrane of the trachea, which however was slight, and not sufficient to explain the symptoms. On the 2d of February inflammation appeared in the glands of the neck, but it yielded readily to treatment; she still, however, remained in a feverish and doubtful state, with a feeble pulse, varying in frequency from 80 to 90. On the 15th of this month the right mamma became hard and painful. The inflammation here speedily went on to suppuration, and a series of abscesses formed, which discharged a large quantity of matter. She improved very much after this, but the abscesses were still secreting pus when she left the hospital on the 14th of March.

This patient, it should be observed, was in the fourth month of pregnancy when she was seized with fever, which from its character and progress appeared of the prevailing type.

CASE XXXV.—*Great intestinal irritation and copious discharges by stool of purulent looking matter.*

Anne Clanny, aged 28, having been ill three weeks, was admitted into St. Bartholomew's Hospital, on the 9th of December, 1837, with a flushed and dusky countenance, pains in the limbs, violent pain in the head, with throbbing of the temples, uneasiness in the abdomen, increased on pressure, urgent diarrhœa, a dry brown tongue, and teeth covered with sordes. The spotted rash was present, was marked and distinct. The chief peculiarity in this case was the urgency of the symptoms referable to the abdomen and the character of the evacuations. The abdomen was much distended, extremely painful, there was constant diarrhœa, and the stomach was so irritable that neither medicine nor nourishment could be retained. The discharges from the bowels, which were copious, consisted of yellow purulent matter of a fetid odour. Her recovery was extremely problematical for more than a week. She was extremely feeble, yet could not be kept in bed without force, and then talked wildly. Her countenance became livid, her extremities cold, her skin clammy, her pulse mounted up to 140. The fur on her tongue became black, the muscles of the face were convulsed, her eye looked glassy, the evacuations from the bowels still appeared purulent, and with the urine were passed unconsciously. A change for the better took place on the 17th of December. She slowly recovered, and left the hospital on the 26th of January.

The inflammation which is produced in typhus is by way of distinction called erysipelatous, and, as I have already observed, has been stated by many writers to differ in some degree from that which is called inflammatory. There is also a peculiarity in it to which allusion has very frequently been made. Dr. Heberden, in his commentaries in treating of erysipelas observed, "natura hujus morbi videtur esse plerumque maligna potius quam inflammatoria."[1] John Hunter unites under one head the erysipelatous, the carbuncular, and that inflammation which immediately precedes mortification. He says, in speaking of carbuncular inflammation, that it produces a suppuration but not an abscess, somewhat similar to the erysipelatous when the inflammation passes into the cellular membrane; for as there are no adhesions, the matter lies in the cells where it was formed. He then goes on to add his suspicion that the inflammation, which produces mortification or death in the part inflamed, and which commonly takes place in old people who have become very much debilitated, is somewhat similar to the carbuncle. It occurs, he adds, in those diseases that have debility

[1] Page 147.

as a principle, and are commonly called putrid fevers; such inflammations have little of the adhesive tumefaction in them but more of the œdematous; and are not clear or transparent in colour but rather of a dusky red. M. Rayer observes,[1] that the gangrenous inflammations of the skin are specific in their origin, and he includes among these typhoid gangrene with the malignant pustule, and carbuncle.

Dr. Thomson remarks[2] "that a disposition in inflamed parts to mortify, manifests itself in many inflammatory affections, and in those constitutional diseases, where peculiar states of the system seem to exist. The incipient stage of gangrene which follows inflammation, particularly when it attacks cutaneous tissue, often resembles the disease, described under the name erysipelas, and so completely as to render it impossible, but by the history of the complaint, to distinguish these two affections from each other.[3] The constitutional symptoms," he adds, "which appear in gangrene, whether succeeding immediately to active inflammation, or occurring as an original idiopathic disease, are not very different in their appearance from those which accompany the different kinds of inflammation. They form fevers which partake, in individual cases, more or less of an inflammatory, typhoid, or bilious character, and vary greatly in degree; but the skin is usually hot and dry at the commencement of the attack, the tongue is without moisture, brown and hard, and the pulse is quicker and less strong than in inflammation;[4] the pulse in these cases is often attended by fluttering intermissions and a considerable degree of subsultus tendinum. The fever has in general more of the asthenic than of the sthenic character; or it is more of the typhoid than of the inflammatory type. The fever in gangrenous affections is often accompanied by great uneasiness and restlessness, dejection of spirits, wildness of the looks; and, in severe cases, with almost always more or less delirium."

The consequences noticed in this fever fully justify the conclusion, that these different results of inflammation are in some way connected. Carbuncle, or a state allied to it, has repeatedly occurred in the epidemic of this spring, and mortification of the cutaneous tissue in various degrees is constantly perceived. The following cases will serve as examples.

CASE XXXVI.—*A hard tumour on the nates, painful to the touch, but little discoloured, apparently allied to carbuncle, and relieved by a crucial incision.*

Mary Burnett, aged 18, was admitted into St. Bartholomew's Hospital on the 1st of February, 1838, labouring under the following symptoms:—Countenance anxious, face flushed, skin hot, tongue

[1] Rayer, 561.
[2] Lectures on Inflammation, p. 503.
[3] Lect. on Inflam. p. 506–508.
[4] Ibid. p. 510.

dry and brown in the centre, teeth coated with sordes, tremors of the limbs, pulse 100, small and weak, pain in the head, intense thirst, hurried breathing, ronchus in the chest. No history could be learnt from her, as she was not sufficiently collected to answer questions rationally. It was understood that she had been ill a fortnight. Next day, the report says, she had no sleep, her evacuations had been all passed unconsciously. In the progress of the case crepitation in the lungs came on, which together with the nervous symptoms had greatly subsided. On the twentieth day of the disease, however, a small slough was noticed on the nates, the nervous symptoms reappeared, the slough on the nates continued to extend, and was found to be based on a hard brawny tumour into which a crucial incision was made, and exit was afforded to a collection of matter diffused in a quantity of sloughing cellular tissue. All the bad symptoms quickly abated after this, and she was discharged well.

CASE XXXVII.—*Inflammation of the parotid gland; a hard, brawny, flat induration of the skin and cellular tissue of the nates, of a dusky red colour and ulcerated at its surface.*

Spencer Leake, aged 46, a publican of intemperate habits, was admitted into St. Bartholomew's Hospital on the 26th of October, 1837, the tenth day of his disease. He was covered with a spotted rash, his complexion was dusky, he complained of great pain in his head with intense thirst and loss of appetite, he had pain in the abdomen with constipated bowels, oppression in the chest with viscid expectoration tinged with blood, slight crepitation at the base of both lungs, respiration increased in frequency, and a dry, brown and glazed tongue; the bowels became tympanitic, and the evacuations passed unconsciously. As he appeared to express uneasiness by frequently putting his hand to the nates, they were examined, and a large carbuncular formation was found on the left side; an incision was made into it, and exit was afforded to a small quantity of highly offensive gas and blood in a state apparently of decomposition mixed with pus. He passed a restless night with low murmuring and delirium, and he sank on the week after his admission. Previously to his death, however, the parotid gland on the right side became swelled, inflamed and ulcerated.

Two or three examples of gangrene will next be given. This termination of the inflammatory process is a very common incident to typhus, especially in that class of the community who seek an asylum at the hand of charity—the needy, the dissolute, the aged and the infirm. Mortification or sloughing to a small extent perpetually results where pressure is exerted upon irritated or inflamed parts of which examples are of daily occurrence. When the destruction involves only a small portion of the skin and the patient is advancing to convalescence, by removing pressure and employing small means, the injury is repaired without serious consequence.

Gangrene from pressure is seen on the back of the head, on the integuments, on the prominence of the spine, hips or nates; but the mortification in typhus is by no means confined to these situations, the anterior as well as the posterior parts of the body are liable to its attacks, the extremities as well as the trunk. One of the hospital nurses, of whose case I have no record as she was not under my charge, exhibited this appalling symptom in a remarkable manner. While yet conscious, keenly alive indeed to her sufferings, all her extremities were dead; every finger, every toe, the ears and nose alike had ceased to exist, and the advance of death was easily traced, as he stealthily but visibly encroached upon the life of his submissive victim. We shall see reason by and by for separating the gangrenous inflammation from the erysipelatous with which it usually is associated, but I pass on to my narative of cases of sloughing.

CASE XXXVIII.— *With sloughing in both feet.*

J. P. Bull, aged 30, was admitted into the Seaman's Hospital on the 2d of March, 1831, labouring under headache, cough, pain in the chest, great thirst, with a dry brown tongue; his pulse was irregular and almost imperceptible.

On the 5th, increased vascularity appeared about the ancles; sloughing resulted, and he lost by mortification several toes of the left foot, and the great and second toe of the right. Healthy processes of reparation were set up, the dead parts were thrown off, and he left the hospital quite recovered in bodily health on the 21st of May, suffering less inconvenience from the mutilation of the foot than could have been anticipated.

CASE XXXIX.—*Sloughing of the integuments over the knees—and of all the soft parts of both lower extremities—amputation of the bones of both legs below the knee—recovery.*

James Davis, aged 25, a watchmaker, was received into St. Bartholomew's Hospital on the 31st of May, 1838. When brought there his aspect was anxious, his countenance pale and cachectic, his breathing quick, he had cough with expectoration of blood, his voice was querulous and expressive of despondency, his chest and limbs were dotted with minute petechiæ, he was unable to walk owing to the condition of his lower extremities, which presented a hideous spectacle, his feet and legs as high as the calf being black, mottled with green; cold as ice, and insensible to the touch, they exhaled a horribly offensive odour, and the cuticle was elevated in many places into blobs or bullæ; the patient on looking at them was overwhelmed with his situation and wept.

No connected account of the early symptoms of his case could be procured from him as his memory was quite confused. He stated, however, that he had always lived well but moderately, that

he had resided with his father, his brother, his sister and his brother-in-law, in the Hackney Road. His father had been attacked with fever and died. Shortly afterwards all the rest of the family were taken ill. The only fact he recollected about the commencement of his illness was his inability one morning to work, and he thought it was owing to headache. His sister, who was also ill with fever, but retained her senses, informed me that her brother very soon after his attack began to sing, and continued calling out loudly and singing for several days, but did not attempt to get out of bed nor did he require restraint. She informed me further that they had been badly off for assistance, as the neighbours were alarmed at the circumstance of their all being ill, and that their only attendant was a young girl who fearlessly braved the danger and ministered to their wants undismayed by the ravings of delirium, and who appeared almost miraculously to escape the general infection. On the 1st of June, the day following this patient's admission, he was reported to have passed a sleepless night, his tongue was dry and disposed to become brown, his expectoration still contained blood, his pulse was 140 with a sharp jerk. The note on the 2d of June was to the following effect:—The blood drawn yesterday formed a jelly, without any separation into crassamentum and serum, the red particles had descended to the bottom and coloured that portion of the mass, the upper part resembled size. On the 3d he was reported to have slept well, tongue was cleaner, pulse softer; in all respects easier. On the 4th he stated that he felt pain in the soles of the feet and at the proximate end of the toes, his expectoration contained less blood, but he was very low. On the 5th he looked pale and anxious, and complained of great pain in the legs, with a sensation resembling that which would be produced by a hot ring round the leg at the junction of the sound with the mortified parts. On the 6th there was increase of pain in the knees, with a healthy line of ulceration bordering the gangrenous parts, both in the legs and at the knees. On the 9th, expectoration ceased, his mind very much disquieted about the fate of his extremities, countenance pale, pulse 140, the mortified parts rapidly separating. On the 16th as much pain was produced by the weight of the dead parts, the integuments being detached and the muscles forming an offensive mass, loose and hanging in shreds, it was resolved to amputate the limbs: accordingly the gangrenous parts of the left leg were divided and the bones sawn through about six inches below the head of the tibia. As circulation through the soft parts had completely ceased, no blood flowed on their division; but the vessels of the bone were pervious and a quantity of blood was thus lost which made him alarmingly faint, and rendered it necessary to postpone the removal of the other leg. On the 19th, however, the right limb was amputated; some bleeding took place, arterial blood flowing in a jet from the bone, but no large quantity was lost. On the 29th he was reported to have gone on favourably, healthy granulations covering the end of the stumps. On the 3d of September

there was no untoward symptom; the extremities of the bones were still denuded; these will be thrown off by necrosis, but he might then be considered as well.

CASE XL.— *With sloughing phagedæna.*

Emma Smith, aged 21, was admitted into St. Bartholomew's Hospital on the 8th of November, 1837. Her countenance was flushed, her skin hot, she swallowed with difficulty, and there was increased vascularity of the soft palate and tonsils, with delirium at night. The history given of her previous state was, that she had been ill for three weeks with fever accompanied by a rash, that sore throat began on its disappearance. On the 11th erysipelas of the face came on. On the 24th a small slough was noticed on the nates. This rapidly increased and put on the peculiar characters of sloughing phagedæna, viz. great pain, rapid increase without any tendency to heal, with the peculiar look and fetor indicative of that complaint. The disorder yielded readily to treatment, and she was discharged well on the 7th of December.

This case, which is one of several that have occurred in this fever, is here mentioned because there seems to be some affinity between the state of the vessels in typhus and in sloughing phagedæna. Dr. Thomson in his Lectures on Inflammation often associates them together: thus at page 487 he observes, that "typhus fever and probably hospital gangrene seem capable of being produced in certain circumstances where the individuals affected by them have not been obviously exposed to infection." Again at page 495, when speaking of opium in the treatment of hospital gangrene, he says "given in an early stage I think I have as in typhus fever repeatedly seen it do harm." He further connects sloughing phagedæna or hospital gangrene with erysipelas and carbuncle. Thus at page 559, he observes that "It is said that in erysipelas, carbuncle, hospital gangrene, &c. patients can seldom bear with impunity any considerable loss of blood." Further at page 577 he continues "In the less acute and more chronic cases of gangrenous inflammation, as in malignant erysipelas and carbuncle, in the gangrene of the toes of old people, in the sphacelating state of hospital gangrene, the emollient poultice may have the addition of the unguentum resinosum, &c." More quotations from the above author might be found bearing on the point, but these will be enough to show all that at present I propose; namely, a sort of connection between the local affection consequent on typhus fever and hospital gangrene.

Although the inflammation excited in typhus most frequently involves the mucous membranes and cellular tissue, and has a great tendency to suppuration or gangrene, yet this is by no means invariably the case. The serous membranes are often implicated, and the ordinary products of increased action in those parts are not

unfrequently produced, forming complications of peritonitis, pleuritis and meningitis. A great many examples might be given, but it will be sufficient to cite a few only to illustrate this statement.

CASE XLI.— *With peritonitis.*

Susan Neale, aged 26, a dress-maker, was exposed to wet on the afternoon of the 28th of October, 1837. In the course of the night she was attacked with shivering followed by thirst and fever. On the following day severe pain in the limbs and abdomen came on. I saw her on the next day, the third from the commencement of her illness. Her countenance then was anxious and flushed, she complained of pain in the head, limbs, and in the larger joints, but her chief uneasiness was in the abdomen, where urgent pain was felt, increased by pressure, and inspiration, in doing which she employed the muscles of the thorax alone. The pain forced her to lie with her knees drawn up. The bowels were constipated, her tongue was coated with a thick yellowish fur, her pulse was 100 with power. The pain did not readily subside, and very energetic measures were found to be necessary; in about a week however the abdominal symptoms were controlled. She had afterwards sore throat with diarrhœa. These ailments were all subdued in turn, but it was six weeks from the time of her attack, before she was able to leave the hospital. I should observe that in this case the rash upon the body was very vivid and abundant.

CASE XLII.— *With peritonitis, ulceration of the intestines, and pus in the fallopian tubes.*

Martha Dean, aged 20, was admitted into St. Bartholomew's Hospital on the 4th of January, 1838.

She had been ill a week. Her illness commenced with pain in the limbs, epigastrium and chest; purging of dark-coloured matter, with thirst, loss of appetite and great heat of skin. Menstruation had been suppressed for three months; she was not enceinte. Her symptoms on admission were pain in the chest and epigastrium, coldness of the extremities, swelling of the right leg, tongue coated in the centre with a brown fur, bowels relaxed, evacuations dark, no pain in the head, no unnatural sound to be detected by auscultation in the chest, pulse 128 and very compressible. There was in this case a mixture of the rash with petechiæ. On the 5th, menstruation appeared. On the 6th she was reported to have slept well, there had been no evacuation from the bowels, the pain in the epigastrium was less. She continued to improve until the 13th, when she was attacked by shivering followed by pain in the abdomen; the pain was increased by pressure and deprived her of all rest; her pulse was 130 and very feeble, her tongue dry and brown, breathing was performed by the respiratory muscles alone. No relief was obtained, and she sank on the 14th.

On examination post mortem the abdomen was found to contain a considerable quantity of turbid fluid mixed with flakes of lymph, and the intestines were coated with a layer of recent lymph which glued them slightly together.

There were several patches of ulceration in the ascending portion of the large intestines.

The other viscera were sound, with the exception of the fallopian tubes, which were observed to be filled with pus.

No perforation of any portion of the intestinal canal had taken place.

There were no morbid appearances either in the chest or head.

CASE XLIII.—*Effusion into the head, indicated by opening of the sutures—recovery.*

Stephen Clarke, aged 19, was admitted into the Seaman's Hospital on the 6th of June, 1831. At that time his face was flushed, his eyes suffused, and his skin covered with small red spots, and he was perspiring profusely. He complained of pain in all his limbs, and in the right side of the chest on coughing, or on inspiring deeply; his pulse was 120, weak and small, but still with sharpness, tongue thickly coated with a dirty fur. He was exceedingly depressed in spirits. On auscultation, fine crepitation was heard at the base of the right lung posteriorly. On the following day he was better, but the pain in the head continued. Much of the activity of the attack was overcome by the measures resorted to, but still the pain in the head remained very severe, and lasted throughout the whole of the month of June; towards the middle of July his hair fell off. On the 21st of that month it was observed that the frontal suture gaped, and he stated that his head was several inches larger in circumference than before his illness. This was proved by the fact that his hat, previously too large, was now infinitely too small. His head measured on the 21st, one foot eleven inches in circumference, and on the 27th was one quarter of an inch larger. The headache was relieved by the opening of the sutures, which took place to such an extent that the finger could be laid between the frontal and parietal bones. August and September passed away, and he still continued much the same; a le to go about, but occasionally suffering severe pain in the head. In November the head was still more enlarged. In December the pain diminished, and the head was found to have returned to its former dimensions, and he was eventually discharged quite well. He called on me this spring, 1838, making no complaints of his former attack.

CASE XLIV.—*With effusion of serum and lymph on the brain and into the ventricles.*

Edward Jones, supposed to be 40 from his aspect, was admitted into the Seaman's Hospital on the 15th of April, 1831. He could give no rational account of himself, being in a state of furious delirium. He complained of no pain, his tongue was clammy, pulse 120 and very weak, he had cough with some crepitation at the posterior part of the right lung, his bowels were constipated, and his limbs were spotted with the rash mixed with true petechiæ. He sank in four days. On examination lymph and serum were copiously effused into the ventricles, and a layer of lymph fully a line in thickness was found on the surface of the hemispheres. The other viscera were healthy except a few very minute ossific deposits around the left auriculo-ventricular opening.

CASE XLV.—*Effusion of bloody serum into the spinal sheath.*

David Smith was admitted into the Seaman's Hospital on the 1st of August, 1831, complaining of great debility and depression of spirits, with headache, giddiness and sore throat. His skin was hot, his tongue coated with a dirty white fur, his bowels were constipated, his skin was covered with red spots; furious delirium came on with strabismus; his face was flushed and his eyes suffused; his pulse became very rapid; it was found necessary to confine him by force. He sank on the 5th, four days after his admission.

On examination there was great vascularity of the pia mater, especially at the base of the brain. The arachnoid membrane was slightly opaque, and there was a bloody fluid effused into the theca of the spine.

The small intestines presented an ecchymosed appearance but without ulceration or much vascularity; the viscera of the thorax were healthy.

When the inflammation attacks the mucous membrane of the bowels, it readily passes into ulceration, implicating first the glandular portion, as has been observed by M. Chomel. A case or two in confirmation of this statement can very easily be found.

CASE XLVI.—*With effusion of bloody serum in the spinal sheath; hepatisation of the lungs; ulceration of the intestines; enlarged glands of the intestines and mesentery.*

Thomas Bampfield, aged 25, was admitted on board the Seaman's Hospital on the 28th of August, 1831. When taken in his complexion was dusky, he was deaf, complained of headache, was delirious and had cough with crepitation in both lungs, his pulse

was 120, very small and weak. He had been ill a fortnight and sank two days after his admission. On examination the following changes were found:—hepatisation of the lung on both sides in the lower lobes posteriorly; numerous ulcers in the lower third of the ileum, circular with raised edges; the glands of the intestines enlarged, and the glands of the corresponding portion of the mesentery also enlarged and indurated; the ventricles of the brain contained serous effusion, and a large quantity of bloody fluid filled the spinal sheath.

The following case occurred during the prevalence of typhus, and although not marked by the rash, yet appeared allied in symptoms to the prevailing epidemic, and exhibited in an instructive manner the connection of cerebral symptoms with irritation of the intestinal canal.

CASE XLVII.— *With ulceration of the intestines—Opisthotonos.*

Carl Hay, a German, was brought on board the Seaman's Hospital on the 10th of November, 1830. When visited, he was lying in a half comatose state; his abdomen tense, but he did not appear to suffer when pressure was made upon it; his bowels were confined, his skin cold, his pulse was very small and weak, his tongue dry and brown and chapped; he had low muttering delirium, and was reported by the persons who brought him to have been ill five days. On the 12th he was still in the same sort of half insensible condition, but he expressed pain on pressure being made on the abdomen; the bowels were confined. On the 13th he seemed better, but was still feverish with a dry tongue.

14th. He was seized with convulsions which gradually increased in severity and became very violent; the muscles of the back were contracted so as to produce complete opisthotonos. He died that evening. Examination of the body was made twelve hours after. Nothing unnatural was observed in the cranium.

The lungs were healthy though somewhat gorged with blood.

The intestines were of a dark colour throughout, exhibiting when laid open, several small patches of ulceration, especially at the lower part of the ileum; and in the centre of one ulcerated portion a large lumbricus teres was found.

Inflammation of the parenchyma not unfrequently occurs, especially in the lungs; this may take place early in the attack, or may show itself at a later period.

Two cases of alteration in the structure of the lungs will be quoted to illustrate this point; one of them to show the nature of the change, the other to prove, how even after a considerable period, perfect restoration may take place. These cases are selected out of many which have served to convince me, that the inflammation in this and probably in other specific fevers is peculiar, less formidable in its nature, more readily yielding to treatment, and within the

reach of medicine for a much longer period than in pure inflammatory fever.

CASE XLVIII.— *With hepatisation of the lung.*

John Hobs, aged 29, a sawyer, was admitted into St. Bartholomew's Hospital, November 27, 1837. He had been attending his wife who was ill with fever, and was attacked himself five days before his application. His countenance was dusky, his eyes were suffused, he was thirsty, had no appetite; there was a spotted rash upon the skin, cough, with expectoration, and some crepitus in the lungs; his tongue was dry and furred. On the 4th of December his countenance was more dusky, eyes more suffused, pulse 130 and feeble, tongue dry and brown, abdomen tympanitic; there was subsultus tendinum, muttering delirium, his skin was cold, his bladder distended by urine, and he had great pain in the abdomen.

On the 5th, subsultus much increased; passed his fæces involuntarily; restless. Died on the 6th.

On a post mortem examination, the abdominal viscera were found healthy; the membranes of the brain were congested; the chief organic change, indeed the only appreciable alteration of structure, was found in the lungs, which were partially hepatised.

CASE XLIX.—*Pneumonia lasting many weeks, but eventually completely subsiding.*

Sarah Nail, aged 36, married, had three children, was living in the month of May, 1837, in the same house with others who were suffering from fever. On the 4th of that month she was exposed to cold, after having been heated by exercise while menstruating; the secretion from the uterus was suddenly stopped, rigors came on, followed by pain in the back, head and extremities; heat of skin succeeded, with thirst, loss of appetite, and feeling of weakness. When I saw her on the 11th of May, she complained of pain in the head, back, and extremities, with thirst and loss of appetite, the skin was hot and dry, and was covered with a dusky rash, the conjunctivæ were injected, but there was no delirium, she had no cough, and neither by auscultation nor percussion could any derangement in the chest be detected. The disease proceeded as usual in severe cases. Disturbance of the intellect came on, with a dry and brown tongue; her position was flat on the back, her evacuations from the bowels passed unconsciously. On the 18th of May, the report of her case was that she slept well at night, had no delirium, pulse 112, tongue moist, skin still covered with the rash, appetite returning; the urine dribbled away, but on the introduction of the catheter a large quantity was drawn off; she continued to improve till the 10th of June, when pain with cough came on, and all the symptoms of pleurisy with pneumonia were present. Complete dulness succeeded crepitation. A month afterwards she left the house with

cough, dyspnœa, and all the signs of consolidation of the lung, which it was feared would remain permanent.

The case was attended to out of the hospital, the patient steadily persisting in the plan recommended for her relief. By degrees the cough abated, the breathing became less laboured, her expectoration ceased, the lung had returned to its natural state, perfectly good respiration being heard in the situation formerly dull, but not until several months had elapsed from the time of her original seizure.

It has been observed that the pulse in this disease presents various morbid indications. The action of the heart has been noticed as irregular, the flow of blood through the artery as unequal. In several of the cases referred to, for instance in the 11th and 21st, disturbance of the circulation was one of the symptoms. According to Rasori, the pulse will vary singularly in the same day, and sometimes cannot be felt in one or either wrist. Whoever has watched cases of typhus will readily bear testimony to the alteration which slight causes will occasion in the power of the circulation. I will mention briefly the particulars of one case in which the pulse could not be felt during a week, and one or two others in which the irregularity in it came on simultaneously with local disturbance, by which we may in some degree infer the cause. The character of the pulse in the fever this year, it may be allowed me to add, differed in some respects from that in the epidemic of 1831, being then generally slower, and exhibiting more frequently the other deviations from the healthy condition, namely, irregularity and intermission. It remains imperceptible for a considerable time, sometimes in one, sometimes in both wrists, as will be now shown, and it is occasionally remarkably slow.

CASE L.—*Pulsations of the radial artery imperceptible during a week—death.*

Anne Taylor, aged 48, was admitted into St. Bartholomew's Hospital on the 26th of April, 1838. At that time her countenance was dusky and heavy, her breathing was hurried, skin covered with a spotted rash, mixed with petechiæ, her position was supine, she talked unconnectedly, there was considerable subsultus of the limbs, her abdomen was tympanitic, her urine passed unconsciously, her pulse was 120, and very feeble. She could give no account of her illness. She lived nine days, during which time the pulse may be said to have been suspected rather than felt.

The appearances observed post mortem indicated effusion into the brain, under the arachnoid and into the ventricles.

No ulceration or inflammation of the intestines was detected.

CASE LI.—*Irregularity of the pulse coming on at the same time with an affection of the bowels and chest.*

Michael Welsh, aged 15, was admitted into St. Bartholomew's Hospital on the 9th of January, 1837, with pain in the forehead, suffusion of the eyes, great prostration of strength, constipated bowels, tongue moist and white, a spotted rash on the skin, a feeble but regular pulse, 108, and slight cough, but without morbid respiratory sounds. He had been ill a week, and stated headache to have been the first symptom of an attack which he ascribed to cold.

10th. Was reported to have slept badly; pulse 130 and full.

12th. Diarrhœa came on.

13th. Pulse was reported irregular, diarrhœa continued.

14th. Large crepitation heard in the chest, pulse irregular and intermittent.

16th. Better in all respects, pulse regular, but 120.

17th. Pulse 104, tongue moist and clean.

20th. Pulse down to 80.

22d. Was reported convalescent.

CASE LII.—*Irregularity of the pulse showing itself at the same time as pneumonia.*

Mary Toomey, aged 22, a servant, came into St. Bartholomew's Hospital on the 5th of June, 1837. She had then pain in the head, oppression in the chest, with cough, dulness of the countenance, suffusion of the eyes, fetid breath, thirst, heat of skin, a dusky spotted rash on the extremities, a furred and dry tongue, and a weak but not irregular pulse. She had been ill five days before her admission, and considered that she had caught the fever from a female with whom she lived, and who at the time was a patient in the hospital. On the 6th of June, the pain in the head was less. On the 8th, although it was stated that she had passed a restless night, yet the pain in the head had still further diminished, and her cough was less troublesome; her pulse was weak, but no irregularity was perceptible. On the 12th, it was observed that when she breathed there was less expansion of the chest on the right than on the left side, and then for the first time it was discovered that the pulse was irregular; no crepitation could be detected in the chest by auscultation at this time; on the 14th, however, crepitation was very distinct. On the 21st, all morbid sounds had disappeared from the chest, and the pulse had for several days lost its irregularity. Debility was now her chief complaint, and she was discharged well on the 10th of July.

CASE LIII.—*Irregularity of the pulse, which ceased whilst the other symptoms continued.*

Mary Hyde, aged 19, was received into St. Bartholomew's Hospital on the 5th of October, 1837. At that time she had pain in the head and limbs, thirst, loss of strength and appetite, great debility, sleeplessness, heat and dryness of the skin, 45 respirations in a minute, sibilus on auscultation in the lungs at the upper portion both anteriorly and posteriorly, pulse very rapid, 150, sharpish and irregular, distention and tenderness of the abdomen, with constipation of the bowels. She stated that she had been ill for a fortnight; her first symptoms was pain in the head. Six days after the first commencement of her attack the chest became affected, and eleven days afterwards the abdominal symptoms were perceived. On the 6th of October, the day following that of her admission, the pain in the head continued, but the irregularity of the pulse had ceased, the abdomen was still tympanitic, and the bowels continued costive. On the 9th she complained of great pain in the head, deafness, cough; the respirations were 48, the pulse 102 and regular. On the 13th she was much better, the pulse was reduced to 80. On the 19th the fever had entirely left her, but deafness continued. On the 6th of November she left the hospital quite recovered.

If we now take a retrospective view of the features exhibited by this disease, we shall see that it may terminate at the end of a week, even when presence of the exanthema proves incontestibly that the fever has been typhus. Loss of appetite, debility, thirst, pain in the head and limbs, with the rash, comprising all the symptoms that show themselves.

Again it has been seen by several cases quoted above, that the disorder may be prolonged through a second week, and how in this stage greater constitutional derangement is excited, owing to more extensive affection of the system. But even under these circumstances the tongue often remains moist, with but little indication of any serious organic change. Should however the disease be aggravated to a third degree, a more formidable train of symptoms present themselves, such as blackness and dryness of the tongue, subsultus tendinum, tremors of the limbs, local inflammation, erysipelas, gangrene, sloughing, low muttering delirium, which are too frequently the forerunners of death. If then typhus can and often does exist without exhibiting these last mentioned exaggerations of its features, we are justified in considering them as something superadded, or as an aggravation of a disease which may be confined to a much more limited course. And here we may obtain important instruction as to the cause and treatment of these symptoms from collateral knowledge about the same phenomena, already familiar to us from their presence in other diseases.

It is asserted by M. Chomel[1] that all the appearances observed in typhus fever are met with in other complaints, indeed it is a matter of common belief that most fevers may have this termination; in other words, that fevers simple at first may eventually be converted into typhus. Cullen expressly defines synochus to be a fever of a simple inflammatory character at its commencement, but which in its progress and towards its close becomes typhus—his definition is the following: Synochus. Morbus contagiosus, febris ex synochâ et typho composita, initio synochâ, progressu et versus finem typhus.[2]

Here then it may be fitting to make a few remarks upon the leading features in typhus; for by searching into the varied and complicated phenomena of this disease, and by considering them both individually and collectively, we may hope at last to arrive at as complete a knowledge of the parts primarily affected, and of the reason of the subsequent alterations of structure, as we are now well accquainted with the consecutive organic changes developed in the course of the complaint. I shall first then speak of the typhoid symptoms.

TYPHOID SYMPTOMS.

After venesection, parturition, or injury of any part of the body, there follows more or less constitutional excitement, with a tendency to the formation of pus, accompanied by a dry and hot skin, black tongue, muttering delirium, subsultus tendinum, stupor, and many of those formidable symptoms that characterise severe attacks of typhus. These symptoms are now properly referred to inflammation of the inner lining of the veins, and it seems therefore a fair inference to be drawn, that although the cause in the two cases may be different, yet that the effect in both is the same; and that both in typhus and the peculiar form of typhoid fever which results from injuries, inflammation of the vessels, and the consequent admixture of morbid secretions from the inner membrane with the blood, is the cause of the serious and alarming symptoms which arise, as well as of the secondary lesions.

Mr. Hunter was one of the earliest to notice the frequency and ill consequence of inflammation in the veins, and the great constitutional disturbances to which it gives rise. In a paper read on the 6th of February, 1784, he remarked, that the inside of veins, like other parts of the body, is often the seat of inflammation and abscess, that he had seen this after death from amputation, compound fractures and mortifications. He observes that many of the consequences erroneously referred to the injury of a nerve after venesection really spring from inflammation of the veins. In his

[1] Chomel, 402. [2] Culleni Synopsis. Nosol. Method. vol. i. p. 78.

paper he does not much dwell on the effects produced upon the constitution, but considers that when inflammation of the veins runs high or is considerably extended, implication of the whole system is to be expected, and that where no adhesions of the sides of the veins are formed, pus passing into the circulation may add to the general disorder, or even render it fatal.'

The following remarks upon this subject are taken from the work of Mr. Hodgson:[2]—"The veins," he says, "are liable to all those morbid changes which are common to soft parts in general, but the membranous lining of these vessels is peculiarly susceptible of inflammation. When a vein is wounded, the inflammation which is the effect of the injury sometimes extends along the lining of the vessel into the principal venous trunks, and in some instances even to the membranes which line the cavities of the heart. This inflammation sometimes produces an effusion of coagulating lymph, by which the opposite sides of the vein are united so as to obliterate the tube: in this manner a great extent of the vessel is occasionally converted into a solid cord. In some instances the secretion of pus into the cavity of the vessel is the consequence of inflammation of the membranous lining of a vein; under these circumstances the matter is either mixed with the circulating blood, or the inflammation having produced adhesion of the sides at certain intervals, boundaries are formed to the collections of pus, which in this manner form a chain of abscesses in the course of the vessel. When the inflammation is not very extensive, its symptoms are the same as those of local inflammation in general, but where the inflammation extends into the principal venous trunks and pus is secreted into the vessel, it is accompanied with a high degree of constitutional irritation, with symptoms which have a striking resemblance to those of typhus fever."

The following symptoms are said by Mr. Arnott to result from attacks of phlebitis—prostration of strength, depression of spirits, great restlessness and anxiety, general pain in the limbs, oppressed and hurried breathing, frequent and severe rigors, vomiting, incoherent muttering, secondary inflammation of a violent character, terminating in effusion of pus or lymph, great exhaustion, dry brown or black tongue, teeth and lips covered with sordes, and low delirium.[3]

The dependence of phlegmasia dolens on phlebitis was pointed out by Dr. Davis in 1823; three years afterwards Mr. Dance attributed the typhoid form of puerperal fever to this cause, and called attention to the close connection between venous inflammation and suppuration in the neighbouring parts.

Mr. Mayo, in his valuable work on Pathology, says that "acute

[1] Med. Trans. of a Society for the Improvement of Med. and Chi. Knowledge, p. 26.

[2] On Diseases of the Arteries and Veins.

[3] Arnott on Secondary Effects of Inflammation in the Veins, XV. vol. Med. Chirurg. Trans. page 53.

phlebitis is liable to occur after dislocations, compound fractures and amputations, in puerperal fever, in malignant disease of the uterus, and in consequence of the injury of single venous trunks; for example after venesection, or tying vessels that are varicose." The same author further observes that "acute inflammation of the veins has a very severe character, the greater part of the vein or veins attacked by phlebitis is found plugged up with coagulum, but at other parts inflammatory products are present, lymph coating the inflamed membranous lining, and pus either diffused or secreted in a chamber circumscribed by lymph and coagulated blood: the attendant fever," he adds, "is of a typhoid character."[1]

There are many other causes which will produce inflammation of the veins, and these are well worth alluding to, as they explain how typhoid symptoms, as they are called, may come on in any fever, and do very often occasion anomalies in the progress of other diseases. Dr. Robert Lee has remarked, that "inflammation of the veins rarely takes place in any part of the body where it cannot be referred to a wound or to some specific cause externally applied to the coats of the vessels. The inflammation in uterine phlebitis cannot it is true be traced in all cases to the semilunar shaped orifices in the lining membrane of the uterus which communicate with the sinuses where the placenta had adhered; yet it scarcely admits of a doubt that the frequent occurrence of the disease arises from the orifices of these veins in the lining membrane of the uterus being left open after the separation of the placenta, by which a direct communication is established between the cavities of these veins and the atmospheric air, in a manner somewhat analogous to what takes place in amputation, and other extensive wounds; generally the inflammation attacks the spermatic veins alone, owing to their being invariably connected with the placenta."[2] He further observes, "that in the unimpregnated female it arises from obstructed menstruation, malignant diseases, &c. It comes on also in the male from irritation commencing in the hemorrhoidal, vesical, or some other branch of the internal iliac veins, in consequence of organic mischief in the pelvic viscera; or more frequently from inflammation being excited in the superficial veins of the leg. External injuries, ulcers, exposure to cold and moisture, are the most frequent causes of inflammation in the saphœna veins. A similar occurrence has taken place in phthisis where there has been ulceration in the intestinal canal; and the same has been observed both in cases of dysentery, and where injury has been done to the prostate gland."

Sir Henry Halford has recorded a celebrated instance of phlebitis arising from exposure to cold, in the case of the late Lord Liverpool, who for many years preceding his death suffered much from this painful disease. The attack was induced by attendance

[1] Mayo's Pathology, 434.
[2] Cyclop. Pract. Med. *art.* Phlegm. dolens. vol. iii. p. 343.

at some state ceremonial, where his lordship had to remain for a considerable time in a current of cold air. The left thigh, groin, and leg, were affected. Leeches and the other usual antiphlogistic remedies were employed in the acute stage of the complaint: he subsequently died of some affection of the brain, but a post mortem examination of the body showed changes of structure in the left iliac, femoral, and saphœna veins, analogous to those which occur in puerperal crural phlebitis.[1]

The references already made to numerous authors contain a catalogue, sufficiently long, of the causes which produce phlebitis; others indeed are not wanting,[2] but what have been given are unequivocal and sufficient.

Examinations post mortem indicating the exact seat and nature of the injury, place beyond a doubt the organic source of the symptoms, and account for their appearance. Thus we see that inflammation of a vein, and admixture of morbid secretions from the inflamed part with the blood, causes on ordinary occasions typhoid symptoms, and gives rise to a fever attended by subsultus tendinum, low muttering delirium, and a black tongue. The similarity of the symptoms in phlebitis, and in one stage or period of typhus, gives reasonable ground for belief that the corresponding appearances in the two diseases arise from a not dissimilar cause, and hence we see an explanation of one great train of effects in typhus, and learn how typhoid symptoms appearing in various diseases, both chronic and acute, may easily and naturally be confounded with real typhus. Hence also we see how readily what is called spontaneous typhus can be generated. This disease is said always to accompany an army, but phlebitis exhibiting urgent constitutional symptoms may probably have been mistaken for it; and we can well understand, that inflammation of the veins would be especially formidable when produced in military hospitals, crowded, ill supplied, and badly ventilated, as they must often of necessity be, during campaigns where troops are in active service, harassed by forced marches, and especially in disastrous retreats. This justifies our admitting, with M. Chomel, that any fever may assume

[1] Cyclop. Pract. Med. *art.* Phlegm. dolens. vol. iii. p. 348.

[2] An exception may be made in favour of the infection of typhus: abundant authority can be quoted for considering this as one source of the puerperal form of phlebitis. Dr. Cusack, in a paper on puerperal fever, has expressed himself favourable to this opinion. Dr. H. McAdam in the article "Peritonitis," in the Cyclopedia of Practical Medicine, says the same, and quotes Dr. Armstrong in confirmation of this statement, who observes in his Morbid Anatomy, p. 96, that "puerperal fever is sometimes genuine typhus, occurring in the puerperal state." Dr. Stokes thinks the same. M. Gase, the translator of Hildenbrand, is equally convinced of this fact, and Dr. Marsh makes the following very important communication on the authority of Dr. Johnson, Professor of Medicine at the College of Surgeons, Dublin. "That the ward-maids of the lying-in hospital caught typhus fever from the patients affected with puerperal fever." Dublin Hospital Reports, vol. iv. p. 521.

the features of typhus, and has led no doubt to the belief in the conversion of one into another, and that an essential difference may exist in the species of a disease at the commencement and termination of its course; but such an adventitious occurrence of typhoid symptoms no more deserves the name of typhus, than spasm of the larynx arising from fits in children merits the appellation of hydrophobia.

HEMORRHAGE.

Cases have been detailed exhibiting this symptom.[1] That it is a very common one appears by the statement of M. Louis, who found it present in the form of epistaxis alone in seven tenths of a series of cases noted by him. It takes place from serous as well as mucous surfaces,[2] its most frequent seat is beneath the cuticle in the shape of petechiæ, and from the nose as epistaxis, its most rare situation is the muscular structure. Before venturing to offer any remarks upon the cause of this feature in typhus, it is important to ascertain the facts concerning it which are already established. M. Andral, in his work on pathological anatomy, has noticed the tendency to effusion of blood in typhus, and observes, that in this disease, as well as in scurvy, by studying their causes, and by inspecting the blood, we can assure ourselves that this fluid is disordered, and that to this we must refer the circumstance.[3]

Dr. Watson, in his excellent lectures on this subject, observes, "that hemorrhage from the bowels is frequently present in that most fatal form of continued fever which is usually attended towards its close by what have been called *putrid* symptoms, such as petechiæ, vibices, bleeding from various parts of the body and an extreme depression of the vital powers. In these symptoms," he adds, "the hemorrhage is strictly of the passive kind, and it is a symptom of the worst omen. It appears to be connected with an altered quality of the fluids of the body, and to be analogous to those effusions of blood from the same parts which occur in scurvy or purpura."[4] That the blood has undergone some alteration in its consistency is apparent from its very aspect, and on some occasions when drawn from a vein it will not separate into the usual division of crassamentum and serum; or if it should do so the coagulum will be loose and sizy; sometimes the red particles separate at once and fall to the bottom, the whole fluid forming a jelly, and the tendency to coagulate being impaired or retarded. Dr. Cheyne found that the blood was sizy in nearly one half the patients bled for the epidemic fever in 1816, in which epidemic bleeding appeared

[1] Cases from 17 to 24.
[2] Case 24, p. 87.
[3] Andral, vol. i. p. 339.
[4] Med. Gaz. vol. x. p. 472.

eminently useful, and was practised in three hundred cases.[1] Mons. Louis has remarked that the blood often will not cup or buff, and he adds, that out of twelve patients whom he bled it was buffed in five only, and that in the others it was soft, greenish, and gelatinous. Mons. Chomel confirms this statement, stating as the result of his observation, that in twenty out of thirty instances the blood did not buff; he also notices that when it was buffed it had not the aspect of that in simple inflammation, and that in some cases this fluid would be completely diffluent.[2] Sir John Pringle, and many others afford us similar testimony.

Fully coinciding in the belief that a morbid condition exists, which is one great predisposing cause of hemorrhage, and quite willing to confirm the statement, that blood when drawn early in the disease, does not in many instances correspond with the other febrile symptoms, as it does not buff and cup; yet this, I would observe, is by no means invariably the case. Hildenbrand, indeed, maintains the contrary during the inflammatory period, so that it is not essential to the disease that the ordinary febrile condition of blood should be absent in the earlier stages; a doubt may then be expressed concerning the hemorrhage in the beginning of the fever having its sole dependence at any rate on the unhealthy condition of the circulating fluids. This fact is further strengthened by considering that the hemorrhage occurs at two periods, one early and the other late. The bleeding, moreover, takes place from the nose and beneath the skin in the one case, from the bowels, kidneys, and internal organs in the other; here we find another point of discrepancy. Again in the earlier period when hemorrhage occurs in the form of petechiæ they are seen most abundantly upon the trunk and upper limbs, when late on the dependent parts or lower extremities. The symptoms with which the hemorrhage is associated are also to be considered as illustrating the condition which gives rise to it. When then we call to mind that hemorrhage appears within a few days after the commencement of an acute febrile attack—when we consider that that attack is one of a decidedly inflammatory nature—when we reflect that the hemorrhage appears even remote from the centre of the circulation or propelling force, and that it is the companion of an exanthematous rash, or other index of inflammatory action, and takes place precisely in those parts or the neighbourhood of those parts which are chiefly the seats of local determination, namely the head and skin—when we see all the proofs of excited action, of which we know hemorrhage to be one consequence, need we hesitate in allowing to the increased activity of the vessels a large share in the production of this phenomenon, which cannot be too carefully separated in our ideas from the large passive bleedings from the bowels which occur in the later stages of the disease. By referring to cases of purpura hemorrhagica, we find two forms of it as distinctly marked, and as

[1] Dublin Hosp. Reports, vol. i. p. 17. [2] Chomel, 51.

opposite in their character, as I believe those of hemorrhage to be in the different periods of typhus.

Several cases of purpura occurred some years ago at St. Bartholomew's Hospital, which afforded a complete illustration of the nature of one form. In these instances the skin was studded with small spots, obviously owing to the effusion of blood beneath the cuticle; the cause of this was evident, for on examining the veins of the limbs so affected they were found to be painful, and hard on pressure, conveying the sensation of a cord beneath the finger, which state was due no doubt to inflammation of the veins in an incipient stage. Depletion by venesection at once arrested, and on repetition cured the disease. The advantage of bleeding in one variety of purpura is shown in a case related by Dr. Latham, in the first volume of the Medical Gazette, and is often illustrated in his practice, as I have frequently had the opportunity of witnessing. Why the bleeding in typhus should take place, more especially from the skin and nose, as so often occurs, must be explained by the fact, that these or the neighbouring parts are especially congested in the earlier stages, and that the coats of the vessels are thin, so as readily to allow the passage of blood. That a great predisposition to hemorrhage from leech bites or other wounds should exist in parts where vessels are dilated or obstructed may naturally be expected, and such is found to be the case; any obstacle to the return of blood must act virtually as a ligature upon the vessel, and force its contents outwards.

In the earlier stages then of typhus, we see that the minuter vessels are excited, by which the first phenomena receive an easy explanation. And the simple resolution of inflammation without further progress will explain the shortest and slightest cases of this disease.

The analogy between typhus and other eruptive diseases is complete with respect to the hemorrhagic tendency. The scarlet fever, described by Dr. Fothergill, in 1747, was attended with bleeding from the mucous membrane of the nose, mouth, ears, and from the uterus. Willan observes that such discharges of blood take place in every variety of scarlatina.[1] Epistaxis occurring at the moment of the eruption in that disease is, according to M. Rayer,[2] reckoned a favourable symptom.

In small-pox there is occasionally a hemorrhagic tendency, the pustules, instead of suppurating, are flaccid, become filled with bloody serum, assume a livid hue, and petechiæ and large phlyctenæ are to be seen in the intervening spaces; this tendency frequently shows itself before the appearance of the pustule.[3] I have seen profuse flooding take place during the premonitory symptoms, and have learnt to regard it as not unfavourable. The wound inflicted by the bite of a leech has been known to occasion great and

[1] Willan on Cutaneous Diseases, p. 320.
[2] Rayer, p. 177. [3] Rayer, p. 380.

alarming hemorrhage in small-pox.[1] Both M. Gendrin and M. Rayer caution us about the application of leeches in measles,[2] for fear the bleeding should be too copious. The earlier symptoms then in typhus appear to resemble those in other eruptive complaints, and are associated with an excited or inflammatory state of the minuter vessels; in which those actions are first set up which are so various in their effects, and so formidable in their consequences. It is to this condition of the vessels that allusion has previously been made; and to which, in my belief, hemorrhage in the earlier stages of typhus is in a great measure to be ascribed.

ERYSIPELAS.

The next subject which claims our attention is the connection of erysipelas with typhus. This occurs very frequently, so frequently indeed that it cannot be regarded as a fortuitous event. It appeared in one seventh of the cases under my care in 1831, and quite as often in the later epidemics, nor was the proportion less among the cases recorded by M. Chomel. It is remarked by Dr. Tweedie, that in the "London Fever Hospital, as well as in general hospitals, erysipelas is by no means uncommon. Of protracted cases of malignant fever especially, it is a frequent and a dangerous consequence."[3] In one case that has been quoted,[4] a man suffering from erysipelas communicated it to a fellow patient who was attending upon him; nor are other examples wanting to me where both medical men and hospital nurses have been attacked after similar exposure. Sometimes, indeed, when produced by the typhoid poison, erysipelas appears as the primary affection, in which case its origin is not unlikely to be overlooked, and the disease to be considered as an idiopathic form of erysipelas. It most commonly, however, shows itself in the third week of typhus, and often earlier even when signs of amendment have declared themselves. If it does not show itself spontaneously, the slightest cause induces its appearance. Commencing usually in the form of a red band across the nose, it quickly extends itself over the rest of the face, then upwards to the head and scalp; the eyes are closed; vesication takes place; and matter is frequently formed in the subcutaneous cellular tissue. When thus produced, it seldom extends beyond the face and head, and varies in its attack from mildness to extreme severity. When it takes its rise from parts previously or recently irritated, as by cupping or other causes, or from excoriations, especially those about the nates, it extends over a wider space, involving sometimes the whole trunk; but in whatever situation it may appear, or however excited, it almost always becomes

[1] Rayer, p. 401.
[2] Ibid. p. 154.
[3] Cyclop. Prac. Med. vol. ii. p. 108.
[4] Case 28.

phlegmonous, terminating in the formation of pus. The appearance of erysipelas cannot but be considered salutary in some cases, as headaches will often disappear and convalescence proceeds rapidly afterwards, in others again it is the immediate cause of death. No doubt can, I think, be entertained that this form of erysipelas is contagious: it seems, indeed, to be one of the shapes that typhus can assume, and the conjecture may be allowed that this is the epidemic form of the disease; for it is notorious that those seasons which give rise to typhus, generate also erysipelas.

I have cited a case to show that typhus can produce erysipelas, but as yet have been unable to satisfy myself of the possibility of one person contracting typhus from another labouring simply under erysipelas,[1] as I have previously said when speaking of typhus and puerperal fever. Some explanation of the condition which produces erysipelas in fever may be found by an inquiry into the circumstances under which it arises in other diseases. Mr. Lawrence informs us, in his masterly treatise on erysipelas, that "the phlegmonous is more commonly idiopathic than the simple form, that it supervenes on the wound of venesection, on injuries of the superficial bursæ, as those of the patella and olecranon, on incised and lacerated wounds, and compound fractures; that an inflamed state of ulcers, especially in the lower extremities, is a common cause of it, and that it has often been produced by wounds received in dissection." He forcibly describes the constitutional disturbance which results from an occurrence of this kind, and observes, that "an inflammation of such extent and violence cannot fail to excite the most serious sympathetic affections, among which may be mentioned disturbance of the nervous system, causing symptoms of typhoid character, inflammation of the lungs or pleuræ, of the intestinal mucous membrane, producing diarrhœa, or of the peritoneum and inflammation or suppuration of other organs."[2]

Phlegmonous erysipelas is thus shown to arise under circumstances which have already been proved to give origin to phlebitis, it is therefore allowable to surmise that they are in some way connected. Erysipelas of the phlegmonous form has been noticed by M. Rayer to result from the application of certain animal poisons to the living body, by which the malignant pustule or anthracion is generated. He also connects this disease with the presence of pus in the circulation; remarking, that anthracion takes place very frequently among persons employed in handling animal substances, such as those who manipulate leather, &c. which persons are frequently the subjects of phlegmono-erysipelatous inflammation, and that when the whole constitution is affected, unequivocal symptoms of an altered state of the blood, or of absorption of pus into the system, are observed: and he quotes a case from M. Littré,

[1] Such an accident is mentioned by Mr. Ingleby, in a paper presently to be referred to.

[2] Med. Chir. Trans. vol. 14. p. 39.

presenting all the features of anthracion, in which pus was found in the veins.[1]

The occurrence then of erysipelas in no way weakens, but on the contrary, tends to confirm the idea that many of the symptoms in typhus are occasioned by inflammation of the vessels, which, we are told by a high authority, is the very essence of erysipelas. Many continental writers indeed consider erysipelas to be caused by an inflammatory condition of the lining membrane of the veins. M. Ribes observes, that both in simple and phlegmonous erysipelas he has found the veins, red, thick, and coated internally with a false membrane; and that the small veins of the integuments are the vessels principally affected, the ramuli of the arteries being less inflamed.[2] M. Cruveilhier goes further, and thinks that where irritation is set up, or inflammation excited in any part, the venous tissue is the seat of the chief phenomena.[3] M. Rayer examined several cases of erysipelas, as he informs us, without finding any inflammation of the veins in the neighbouring parts; his investigations however were limited to the larger vessels, in consequence, as he states, of the difficulty of duly ascertaining the condition of the smaller ones. His inquiries would therefore lead to the inference that inflammation, if excited in the veins, does not reach the larger branches: but they leave untouched the statements of MM. Ribes and Cruveilhier.

Some connection appears clearly to exist between erysipelas and several eruptive diseases. After inoculation, both variolous and vaccine, an erysipelatous inflammation occasionally shows itself, and sometimesproves fatal; several cases of this sort are related by Willan.[4] Dr. G. Gregory has described this result in small-pox; he states that, "the secondary fever of small pox (that accession namely of febrile symptoms which takes place on the ninth or tenth day) is accompanied with some form of inflammatory action on the surface; trails of erythematous redness appear in several parts, or a genuine erysipelas attacks the head, trunk, or limbs;" he goes on to detail some further consequences, and adds, "it is not uncommon to find even the milder cases attacked, during apparent convalescence, with fever, sore throat, and erysipelas of the face or extremities."[5]

Erysipelas appears also to be allied in some way with scarlatina. Rayer observes, that "whatever the form under which scarlatina shows itself, the eruption may be complicated with other inflammatory affections of the skin," and amongst these he enumerates erysipelas.[6] A very interesting illustration of this alliance presented itself to me last year; I was desired to see a gentleman labouring under scarlet fever; the symptoms were well marked,

[1] Rayer, p. 561.
[2] Andral, Précis d' Anat. Path. tom. ii. p. 406.
[3] Andral, p. 392.
[4] Willan, p. 510.
[5] Cyclop. Prac. Med. *art.* Small-pox, vol. iii. p. 741.
[6] Rayer, p. 170.

and the disease severe, but it proceeded favourably; during his convalescence traces of erysipelas showed themselves on the face; his sister, who had been his constant companion and nurse in the earlier period of the disorder, was now attacked by scarlet fever; a brother, who on this became the chief attendant, was also taken ill in a few days, not however with scarlatina, but with erysipelas of the face and head; all three were invalids at the same time, in all the symptoms were urgent, but the disorder in each terminated favourably. The connection of typhus with puerperal fever has been shown; its connection also with erysipelas is ably contended for in a paper by Mr. Ingleby of Birmingham, in the Edinburgh Medical and Surgical Journal.[1] Allusion only can be made to this branch of my present topic, though highly interesting, as it has already perhaps been dwelt upon too long; and I will merely pause to hazard a suggestion that the frequent appearance of erysipelas across the face, when the vessels of the brain are excited, and the affection of the head when erysipelas of the face has come on, are owing to the connection of two parts, which are united as well by continuity of tissue as by sympathy.

SUPPURATION.

Whether it is right or wrong to refer a certain series of the symptoms in typhus to inflammation of the vessels, and circulation of pus, may possibly be questioned; that there is in this disease frequent secretion of purulent matter, and often to a great extent in different parts, cannot be denied; no part indeed can be considered free from a liability to such formation, "convalescentes," we read, "sæpe habent apostemata aurium," and numerous other instances have been given in the cases already cited as illustrative of suppuration in typhus. The parotid, the submaxillary, and other glands swell and discharge pus, it is readily produced by erysipelas, inflammation of the lungs not unfrequently assumes the purulent form, pus is found deposited upon the brain, even in its very substance, abscesses form beneath the pectoral muscle, and also in other situations.

A tendency to the secretion of matter is seen in a certain condition of the system, when inflammation has been excited by introduction of animal poisons into the circulation, as well as after inflammation of the veins from wounds, &c. Mr. Rose's paper[2] on large collections of pus in various parts of the body, especially after injuries of the head, is very universally known; he gives as the result of his experience, that these abscesses usually form at the end of the second or fifth week after the accident, which gave rise to them; these he refers to constitutional excitement arising from

[1] Vol. 58. no. cxxxv. April, 1838.

[2] Med. Chir. Trans. vol. xiv.

local injuries, and thinks them striking illustrations of the irregular action in the vascular system, which such irritation occasions. A more simple explanation may perhaps be found in the state of the fluids arising from an inflammatory condition of vessels. Between the extensive suppurations in typhus, variola, and charbon we find a correspondence which shows, that if large formations of matter be not absolutely incident to inflammation excited by animal poisons, they are at least very easily occasioned by them. It has been observed by M. Gendrin that blood drawn from patients during suppuration in small-pox, not only exhibits the inflammatory crust, which is not the case previously to the formation of matter, but also that its aspect is peculiar, being more diaphanous and softer than ordinary buff, and its colour a dirty white; these appearances he imagines to arise from the presence of pus in the circulating fluid: this, and the known fact, that pus when injected into the veins produces rapid and abundant suppuration, is considered by the last cited author as sufficient to account for those phlegmonous attacks and abscesses which so frequently prove serious in variola.

Dr. Gregory confirms the frequency of purulent depositions in small-pox, and observes that in some cases the secondary fever is accompanied by cutaneous and cellular inflammation, but more circumscribed than in the cases lately quoted, leading to the formation of abscesses of great extent, of boils and carbuncles. In some cases the scalp is the part which receives the violence of the fever, or a diffuse cellular inflammation takes place, which is followed by purulent infiltration. He further remarks, that the destructive effects of the secondary fever are by no means confined to the surface of the body. It frequently happens that without any obvious cause some internal organ receives the violence of the febrile shock. Acute inflammation is set up, and the result is in almost all cases suppuration. Variolous pleurisy comes on about the eleventh or twelfth days, for the most part very suddenly, and proceeds rapidly to empyema. We have seen it, he observes, prove fatal in thirty-six hours.[1]

Typhus then shares with other eruptive disorders a tendency to the formation of pus, should the disease not be checked in its early period; this formation appears sometimes to be a desirable event, for instance in erysipelas; as when matter is detected, and pus let out, the disorder seems to have reached its acme, and then declines.

GANGRENE.

We admit that gangrene is one of the terminations of inflammation, and such undoubtedly it is, but our admission is perhaps made

[1] Cyclop. Pract. Med. vol. iii. p. 741.

without considering what is the character or seat of the inflammation which leads to such a consequence. Gangrene or sphacelation, to a greater or less extent, is a very common incident in typhus, but it is not the most intense inflammation which tends to produce this result; if indeed we consider that inflammation to be the most intense, which exhibits deep redness, considerable swelling, occupies a large space, and produces urgent constitutional symptoms; and if we understand by gangrene or mortification, the cold, black, fetid mass which animal matter exhibits when deprived of vitality. An illustration of this statement is afforded by erysipelas, which exhibits occasionally the most intense degree of inflammation, and assumes the most virulent character, without any tendency to slough. I have seen the face swelled to double its natural size, and of a deep red colour, the eyes closed, the nose stopped, the lips protruded, greatly enlarged and hideously disfiguring the countenance, the tongue so swollen as to impede deglutition, local symptoms of the most formidable kind, accompanied too by furious delirium, yet all has ended favourably without any appearance of gangrene. In the most marked cases of mortification which it has happened to me to meet with, the death of the part has succeeded quickly to previous symptoms of inflammation, which has shown but little tendency to any other result, such as the effusion of serum or the formation of pus. Gangrene is constantly considered to result from the weight of the body pressing upon affected parts: but pressure cannot be the cause in many cases of typhus. I have already quoted instances in which the feet sloughed, as also the skin of the knees, the integuments of the anterior part of the trunk, the extremities of the fingers and even the nose, which was not subject to the contact, much less to the pressure of the bed clothes. It is regarded as a proof of great debility, but if we look attentively at what takes place in the immediate contiguity of mortified parts, we shall see that in most cases healthy ulceration is set up, and the dead parts naturally separate, showing no want of constitutional vigour; in others, however, it must be admitted, there is but little attempt at reparation.

If we search for an explanation of the phenomena in the ordinary circumstances under which gangrene is produced, we find that it arises from extremes of temperature, from various mechanical and chemical injuries, and from all causes which produce complete obstruction of the vessels. The cause of obstruction may be in the veins, when the pressure of blood in the arteries would excite inflammation, as Mr. Carswell has represented in his plate to illustrate this subject. Again, the fault may be on the side of the arteries, although M. Bichat maintains that "gangrene never occurs from simple inflammation of the internal membrane of arteries."[1] This, however, is not supported by the opinion of M. Dupuytren, who observes, in treating of symptomatic gangrene, in his Leçons

[1] Anat. Gen. par Beclard, tom. ii. p. 159.

Orales de Clinique Chirurgicale, that the senile dry gangrene arises from inflammation of the principal arteries in the affected part, the result of which is to occasion the complete obstruction of the vessels, and to cause a total stagnation of blood," he also points out the fact, "that this gangrene will attack children of ten years of age, adults, those in the prime of life, as well as the aged. The ossification found in some cases is simply a coincidence, for ossification often exists without gangrene. The cause is the obliteration of the arteries and the stoppage of the circulation in the canals. Gangrene is mostly preceded by pain in the limbs, and other signs of inflammation, but they are by no means invariably present." "The symptoms," he adds, "are sometimes extremely perplexing, there being no external lesion, no derangement of external organs, the breathing and circulation remain regular, and the brain and digestive organs exercise their functions as in health." He then traces the progress of the disease, and notices the extreme degree of cold which characterises the mortified part, which he says is even below that of a dead body or limb; and observes that the thermometer sinks lower when in contact with a mortified part than when exposed to the air, or even when plunged into a stream of running water.

When the gangrene is dry and black, it proves, according to Mr. W. Chevalier, that both sets of vessels are obliterated, whereas, when it is pale or white, the obstruction is in the arteries alone. All these circumstances connected with the subject are of great interest, and many highly obscure, yet not being unfrequently met with, attention need only be called to them, that opportunities of gaining instruction may not be lost when means of investigation occur.

It is probable that in typhus we have mixed phenomena, and an intricate combination of circumstances, to which some elucidation may perhaps be afforded by improved knowledge as to the state of the vessels in those cases where gangrene arises from improper food, such for instance as rye, when ergotted, which gives rise to a disease, very common in countries where that corn is much used as food, and where, as in typhus, there appears to be brought about a disordered state of the circulating fluids combined with vascular irritation.

The above leads us naturally to consider whether the arteries may not in all instances be implicated, and their circulation checked by inflammation: this I am not prepared to maintain, but it is highly probable that such is in many cases the fact, while the condition of the fluids may be chiefly instrumental to this process in others, for it takes place late in the disease, when there is a decided alteration in their character, accompanied by symptoms of extreme debility and a general proneness to decomposition.

Scarlet fever exhibits the tendency to mortification in a remarkable degree. We well know, indeed, that it constitutes a prominent feature in the malignant form of that disease. Inflammation of the

throat puts on this character in the variety called anginosa, but the disposition to sphacelus is also shown where inflammation arises elsewhere. In a description of the epidemic scarlet fever prevalent in Cornwall in 1749, among other alarming signs were pustules in the groin, which threatened mortification even in the beginning.[1] Reference to more authors for confirmation of this complication of gangrene with scarlatina can scarcely be necessary. It was noticed in that attack which committed such havoc in Sicily during the years 1575–76; for this, although described as a pestilent and contagious disease by Ingrassia, was no doubt a most malignant form of scarlatina,[2] and when we read the accounts of older authors upon the subject of the different plagues which are represented as depopulating villages, and devastating whole countries, it is quite clear that they refer in very many instances to occasional attacks of infectious eruptive diseases; the apprehension created by the appearance of which, was heightened by the limited knowledge of practitioners in those days as to their nature; and the mortality was increased by the erroneous notions then prevalent as to their treatment, and by the absence of proper measures to prevent their extension.

PECULIARITY OF THE INFLAMMATION IN TYPHUS.

Hunter, Heberden, with many other sound and accurate observers, have noticed that certain circumstances alter and modify inflammation: to one of its many forms the title erysipelatous has been applied, but even this varies, being slight, erratic, diffuse, and comparatively trivial in some cases, but in others it is firmly established, involves deeply seated parts, is phlegmonous, and truly formidable; but whether phlegmonous or erratic, its peculiar character remains invariably the same. The inflammation which occurs in putrid fevers is said to have but little of the "adhesive tumefaction in it, but more of "the œdematous." In typhus and in the exanthemata we find all the consequences of excitement of the vessels, we have increased temperature, redness, dilatation of calibre in the minute vessels, secretion of serum, lymph, and pus, but with respect to these two last secretions, there is a peculiarity in these diseases; they have, to use again Mr. Hunter's phrase, but little of the adhesive tumefaction in them. The circumstances under which pus and lymph are produced may give some insight into the processes of the fever now under consideration. We know that the existence of suppuration and the effusion of coagulable matter at one and the same point is

[1] Willan, p. 332–328.

[2] Informatione del pestifero et contagioso morbo il quale affligge et have afflitto questa città di Palermo et molte altre città et terre di questo regno di Sicilia nell' anno 1575–76, par Ingrassia. Palermo, 4to. 1576.

impossible, the presence of the one invariably precluding the appearance of the other. Suppuration is a secondary stage in the process of reparation, and takes place, when healing by adhesive inflammation is retarded or prevented: without entering into the theories about the formation of pus, without stopping to inquire whether it be a secretion, as Mr. Hunter supposed, or an altered condition of the blood itself, as Muller[1] seems more correctly to regard it, but merely mentioning that M. Gendrin[2] maintains that it may be seen actually circulating in the vessels; I pass on to a fact mentioned by Mr. Mayo, explanatory of the peculiarity before alluded to. He tells us that "in persons labouring under typhus, the character of the excitement is peculiar: serum and lymph appear so sparingly poured out that consolidation and organisation of new parts takes place very slowly, if at all, and there is no escape of fibrine, though frequently of pus from the vessels."[3] This fact is very important, as tending to explain the diffuse character of the suppuration occurring in typhus, diffuse because it is not retained in its situation by secretion of fibrine, which occasions the adhesive tumefaction. This deficiency of fibrine enables us to see why recovery takes place most readily in parts which have been the seat of inflammation, as there is then obviously less tendency to organisation; pus, indeed, is readily poured out, this however is not susceptible of organisation at all, and the lymph of typhus is but little plastic.

The causes which induce the secretion of pus or lymph will have reference either to the condition of the part itself or to that of the circulating fluids, and whether we consider pus a secretion or a modification of the blood, in either case we must expect that the state of the circulating fluids would exert some influence upon it. Lecanu has found that the quantity of (dry) fibrine in the blood varies under different circumstances from one to seven parts in a thousand,[4] it is known to alter after repeated blood-lettings, is essentially diminished by any injury of the nerves, and in animals after laborious exertion,[5] as recently proved by M. Dupuy: its condition undergoes a positive change, when fainting is brought on by venesection. This incident well exemplifies the influence of the nervous system upon the blood: which, practitioners have observed, under these circumstances ceases either to buff and cup, even when drawn during the active stage of acute inflammation. In short, we find that whatever diminishes the nervous influence has an injurious effect upon the blood, lessening its power of coagulation, and impairing its vitality. This, with other causes, tends in my belief to produce that series of phenomena so commonly appearing both in this

[1] Muller, p. 435.
[2] Gendrin, Hist. Anat. des Inflam. tom. 2, p. 456.
[3] Mayo, Pathology, 428–9.
[4] Muller, p. 114. [5] Andral, tom. 1, p. 543–546.

and in eruptive fevers, and known by the appellation of putrid symptoms. Upon these I may now therefore appropriately offer a few remarks.

PUTRID SYMPTOMS.

Want of power in the blood to coagulate, utter prostration of strength, effusion of fluids from the vessels, ready mortification of parts, with a tendency to decomposition and extrication of gaseous matters, form a diathesis or state of the system, commonly denominated putrid. The presence of one or more of the above symptoms gives a fever the character of malignity. This type was marked in many cases of the typhus in 1831, and has often been seen in the more recent epidemics. A proneness to become putrid appears natural in many constitutions, in others it may be induced by particular circumstances, but typhus and the other exanthemata seem invariably to develope or generate this condition in all. Mr. Hunter takes notice of the natural tendency to putridity, and says "that different effects may be produced in two individuals by the same poison, the symptoms being in the one true inflammatory, in the other putrid. If the constitution has a susceptibility to be putrid, and small-pox attacks it, the inflammation will be the small-pox joined with the putrid mode of action."[1] We may infer in some measure the reason of this by considering the circumstances under which the putrid diathesis is engendered or acquired. The chief appreciable causes of this state appear to be the condition of the atmosphere and certain habits of life. It is unnecessary to dwell upon the influence of seasons, or the unusual mortality in particular years, as that will be conceded by all; but although we draw general inferences from such a fact, showing the prevalence of wet, moisture, &c. to be inductive of disease and prejudicial to life, we advance but little in explaining the results of typhus. More decided causes and more palpable effects are to be found in certain habits of life, by which I would only be understood to mean such customs as use or necessity has imposed upon society. Passing at once to the condition of that class in which a disposition to putridity is most especially shown in disease, we meet with it amongst those compelled to live in dark, ill-ventilated, and crowded apartments. We find it in persons whose limited means and hard-earned wages deny them wherewithal to allay the bare cravings of hunger, still less to guard against the inclemencies of the weather, and the vicissitudes of an ever-varying climate, and on whom, lowered by privation and exposure, despondency exerts her baneful influence. Now what effect does want of light and fresh air produce on sanguification? What causes the pale cheek and haggard look? The answer to

[1] Hunter on the Blood, p. 327–333. [2] Willan, p. 282.

these questions is given us by M. Andral, who observes in his pathological anatomy, that there are certain morbid conditions in which before life has ceased the laws which regulate all matter overcome the resistance of vitality, and while consciousness remains and life still lingers, the system loses its power of generating heat, chemical affinities begin to exert themselves, and putrid symptoms result; these he refers to depression of nervous energy, and then goes on to notice the different modifications of external influences, which more or less are in constant operation upon our frames, such as exclusion of the sun's rays, living constantly in a damp situation, and imperfect nutrition of the body: occupancy of unhealthy places, or deficient alimentation, at once strike at the functions of the lungs and skin, the direct and indirect organs of sanguification; wasting ensues, the circulating fluids are impoverished, the blood becomes thin, watery, deficient in fibrine, and palpably disordered.[1]

These are the organic effects of the miseries of actual famine, or that extreme state of want bordering too closely upon it, and necessarily met with among some individuals in all large and populous communities. Thus we find a ready cause for the anxious look, the real weakness, the emaciation, the tendency to perspiration, the great dyspnœa, the disturbance of the brain, with delirium or excitement, the palpitation of the heart, accompanied by many of those symptoms, which although arising from an opposite cause, so closely resemble inflammation.

In such cases, as M. Andral has observed, we may anticipate the worst consequences from vascular excitement. We may expect effusion of blood, great prostration of strength, hemorrhage, and mortification, in short all the signs of putridity.[2] Nay, even without the occurrence of fever, we see the effusion of serum in the shape of dropsical swellings and of blood in that of purpura.[3] The effects of typhus, engrafted on such a community, are shown in the details of the various instances of famine which have occasionally devastated our land. We may then entertain the idea that if there be a constitutional tendency to what are called putrid symptoms, a condition of the blood must exist similar to that which is engendered by want and other depressing causes. It has been observed that the symptoms of typhus under all circumstances tend, unless arrested, to putridity. This fact was not unnoticed by Mr. Hunter, who observes that "there are specific irritations which do not affect a part, or the constitution as a common irritation, but affect them in a way peculiar to the irritation, altering at the same time both the parts affected, and the constitution from a healthy state to an unhealthy one of its own kind. This seems the case with the plague, perhaps with the putrid and jail distempers in a less degree; for whatever

[1] Andral, Précis. d'Anat. Pat. tom. 1, p. 88. 573.
[2] M. Andral, Précis d'Anat. Pat. tom. 1, p. 83, 84, 541.
[3] Ibid. tom. 2, part 1, p. 219.

be the kind of constitution which they attack, they always reduce that constitution to their own kind."[1]

That the condition of the nervous system is deeply implicated, appears by derangement of the intellectual faculties, by disturbance of bodily functions, and by irregularity in the pulsations of the heart. Under these circumstances it is not surprising that an essential change in the circulating fluids comes on during the course of typhus, and that a tendency to putridity is engendered.

The close analogy between typhus and the exanthemata is here shown, for it is well known that measles occasionally assume a putrid form, less frequently indeed than formerly, as our method in treating this disease, which may be said to be now thoroughly understood, has of late years been greatly improved. Dr. Fothergill wrote an account of the scarlet fever which prevailed in London in 1747–8, and put on occasionally this aspect; he remarks, that "in some cases the disease appears to be of so mild a nature, and so benign, as to require but little assistance from art. Persons even recover from it under the disadvantages of unskilful and injurious management; whilst in others the progress of the symptoms is so rapid, and the tendency to corruption so strong, that nothing seems able to oppose it. Just as it happens in the small-pox, the benign and distinct sort bears ill-treatment without injury: in the malignant flux kind, the utmost art and experience are too often insufficient to conduct the distemper to a happy issue."

I am well aware how dangerous it is to advocate a false theory, and know that any attempt to explain the phenomena of fever will justly excite the suspicion of the cautious, lest in yielding credence to notions supported by inference rather than by demonstration, they should be led away from the path of established practice into the mazes of speculative treatment. Numerous organs are implicated in typhus, and we have as numerous theories, ascribing to each all the phenomena which appear; but such have as yet been found insufficient to explain the varied aspects put on by this complicated disease; in turn has each part, though considered the chief seat of the malady, been found free from all morbid alteration; and this Proteus, still present under a new form, has continued to elude the shackles of nosologists. Those who disregard all theory, and content themselves with meeting symptoms as they arise, will confine their views to the effects of a disease; but art then alone rises into science, when besides meeting effects we search after causes; and when administering appropriate remedies, can give a reason for their use, and can explain their operation.

A theory, which ascribes the origin of typhus to the operation of a specific poison, producing a series of morbid actions, and provoking inflammation of a modified character, must at least be less injurious in practice than that doctrine which ascribes all the processes of this fever to so insufficient a cause as debility. The terms adynamic,

[1] Hunter on the Blood, p. 331.

ataxic, and asthenic, are still daily applied to typhus, and show that the erroneous doctrines which formerly obtained, still meet with supporters at this day: they are indeed specious, so deceitful is the aspect and so depressed are the feelings of a patient, that unless acquainted by experience with the consequences of acting upon this notion in the earlier periods of the disease, we are likely to fall into the fatal errors which result from the theories of Browne. A moment's reflection must satisfy all that no degree of weakness is capable of producing the symptoms of typhus. When weakness does occur it must be a consequence, and we have in our treatment to obviate its effects; but he slumbers upon a volcano who does not see in this fever the tendency to inflammatory action, and all the results of a modified condition of that state. He who attributes all to debility must refer to this alone the various processes which I have shown to arise, such as consolidation of the lungs, inflammation in every organ, ulceration of mucous membranes, adhesion of serous ones and the universal effusion of pus. The discoveries of modern pathologists, who find in most cases essential change in all important organs of the body, must alone overthrow the doctrine of mere debility. How can the advocate of this theory account for the effusion of lymph or pus upon the brain or into the pleuræ, as seen in post mortem examinations; how can he explain why the solid lung sinks in water, or why ulceration successively destroys each tunic of the intestine, and finally perforates its coats; such effects are produced by typhus, but never can arise from debility. Weakness indeed has its own peculiar characteristics, but far differing from those mentioned above. Exhaustion is not well portrayed in the fierce look and congested eye of early and furious delirium; hurried breathing, dulness of the chest on percussion, with crepitation, but badly support the theory of debility; tenderness of the abdomen, with watery or sanguineous evacuations, point out other mischief than deficient nervous energy, yet all these are constantly met with in typhus. Dr. Bateman, in treating of the epidemic fever of his day, which he considered to be the same with the putrid pestilential fever of Huxham and Sydenham, makes some excellent remarks upon this subject, and thus expresses the mode by which the conviction of the efficacy of a treatment, irreconcileable to the theory of debility, was forced upon him:—"I believe there are few physicians, who, like myself, commenced their professional career impressed with the doctrines that prevailed in the schools at the close of the past century, when the terror of debility was certainly predominant, who will not confess that their subsequent practice has been a continued struggle between the prejudices of education and the staring conviction of opposing facts, which continually force themselves upon their attention; and that they have been compelled to a gradual but material change in their views respecting the use of the lancet in fever and other diseases. I am fully conscious of the extent to which my own practice has been cramped by this prejudice, and of the reluctance with which I have admitted the

evidence of my senses, till frequent repetitions, and the sanction of other authorities, had rendered it irresistible. My testimony, therefore," he adds, "on this point, cannot be deemed the result of haste or temerity." The same author in another place observes how experience had taught him "that the supine and helpless condition of a patient, his constant and feeble mutterings when spoken to, his dark and trembling tongue, his dull and sunken eye, his starting tendons, and his involuntary evacuations, are not mere effects of general prostration, and by no means to be treated by active stimulants as the sole means of counteracting the tendency to death."[1] The above mentioned symptoms with local inflammation, their constant attendant, must have an exciting cause: they come on in the course of typhus, and therefore result from some hidden action in the system; and although all are not absolutely essential to this disease, yet most of them appear in its protracted and severer forms. If, then, a train of corresponding symptoms can be shown to arise from various injuries, as, from the prick of a lancet, and the more general division of parts by the amputation knife, or from other external injuries, it is not exceeding the bounds of legitimate reasoning and fair analogy to conclude that they originate in both cases from a similar cause, which in wounds has been clearly shown to be the admixture of purulent secretions with the blood. Should inflammation of the minuter vessels be admitted as an early step in typhus, an explanation will at once be afforded us of the various consequences which ensue. The phlegmonous erysipelas, the large abscesses in various parts, the extensive internal inflammations, the state like phlegmasia dolens, which I have seen in this complaint, will at once receive elucidation: the great and peculiar constitutional disturbance will no longer remain a matter of obscurity, and though the disease may still baffle our attempts at cure, we shall not be led astray by the mischievous idea of referring every thing in fever to debility of the nervous power, as if the vascular system remained perfectly quiescent, and the circulating fluids were incapable of morbid alteration.

That many of the symptoms which have hitherto rendered typhus so formidable, and which appear as the disease advances, are owing to some such cause as that above mentioned, I do not see room to doubt, it being as capable of explaining the earlier as well as the later phenomena, both of which justify my attributing much in this fever to inflammation of the minuter vessels.

It is one of my objects to show that typhus is an eruptive disease. The simple appearance of a rash proves an alteration in the natural condition of the vessels of the skin; that this condition is inflammatory, the symptoms which accompany it sufficiently attest. The seat of inflammation in measles, which is nearest in its aspect to typhus, is the reticular tissue; and M. Gendrin informs us, that in the acute stage of those inflammations of the skin, which he calls

[1] Bateman, p. 118.

erythemoid, the excitement occupies the superficies alone, and does not extend beyond the reticular layer.[1] It would therefore probably be erroneous to state, that the first affection began in the veins, especially when we see how suddenly eruptions disappear, which would sufficiently testify that the irritation is, at any rate, seated in a portion of the vascular system possessing considerable irritability. That inflammation is excited in this tissue, may be inferred from other consequences as well as from the rash. Two of the most constant occurrences will receive from this notion their easiest and most rational explanation. These two are the appearance of petechiæ and the epistaxis, both dependent upon the same cause, and both varieties of the same process, hemorrhage. Petechiæ, as I have shown, appear sometimes with, sometimes without, the rash; they show themselves at two distinct periods, and are produced by very different causes. I here allude to that crop which shows itself early, within the first few days of the attack, when every symptom indicates an excitement of the vascular system. Now hemorrhage is clearly one of the consequences of this state, the hyperemie sthenique of M. Andral; if then we find the state of vessels such as would induce active hemorrhage and the actual discharge of blood, we cannot regard them as other than cause and effect, more especially conjoined as it is with an altered state of the fluids.

Typhus may stop at an early period, having occupied in its progress a week or less, when many formidable symptoms will be wanting; but should it be prolonged, or prove extremely severe, we have precisely such a train of symptoms as we might expect from extension of inflammation in the vessels, and its known consequences. We have all those symptoms before enumerated as resulting from inflammation of the veins, and called typhoid from their resemblance to similar ones in that fever: we find the black tongue, the muttering delirium, the subsultus tendinum, a state often connected with great debility, but certainly not produced by it. It is not a matter of much moment at this time to pursue an inquiry into the niceties as to whether minute arteries or veins were the seat of inflammation, while the question itself of the inflammatory state of the vessels remains unsettled, or still may be in dispute; but I may remark, as strengthening the idea, that the venous is the system most likely to be the seat of such a change, that M. Andral has asserted, that pus is more frequently found in the veins than in the arteries. Mr. Carswell states, in his work on Pathological Anatomy, when treating of the subject of inflammation, and in allusion to suppuration resulting from injuries, wounds, &c., that pus is often found in the veins of the affected part, but never in the arteries. Dr. Armstrong was so satisfied that by some means the venous system was affected in typhus, that he named one variety of it "congestive" from this cause. In entertaining the question of inflammation of vessels being confined to one or other set, we must recollect, that the

[1] Gendrin, vol. i. p. 414.

point at which arteries terminate and veins commence cannot be exactly defined, the transition from one to the other is so very gradual, but we may infer that should both be equally exposed to an irritating cause, the veins would most readily take on the inflammatory action; a point well illustrated by the different effect of a ligature, which if applied to an artery produces little irritation, but a contrary result when enclosing a vein. M. Gendrin has noticed an important fact with respect to inflammation in the two series of vessels, and one which would tend in some degree to explain the extension of inflammation if excited in the veins. This diligent inquirer has observed that when inflammation attacks the arterial tube, it rarely passes the internal tunic, but when the veins are implicated, inflammation readily extends from the inner surface to the outer coats, and into the surrounding parts, which become infiltered with pus.[1] Thus may we account for the great tendency to erysipelas in phlebitis, and the ready formation of abscess.

The greater facility with which inflammation spreads in veins than in arteries, is thus alluded to by Muller. "Phlebitis being excited at any point by causes capable of giving rise to inflammation, extends so rapidly that in a short space of time all the venous trunks of the limb become affected."[2] This is a striking contrast to the similar result in arteries, when speaking of which, this eminent physiologist remarks, "the local diseases of arteries, such as inflammation and dilatation, are in a great measure limited to the point to which their exciting cause was applied, and have no tendency to spread."[3] I should add, however, that the arteries are inflamed in some cases of typhoid disease: M. Gendrin found pus in the arteries of a man who had died from fever in consequence of a wound in the hand, voluntarily inflicted, with the view of thus getting a discharge from his military duties: the same author quotes a case from Portal, of a young man who died after a few days from measles, in whom the aorta was found to be inflamed. I examined one case of fever, in which there were undoubted signs of inflammation in all the larger arteries. the vasa vasorum were seen distinctly ramifying upon the aorta and its branches, to a second and third degree. This patient was admitted into St. Bartholomew's Hospital under Dr. Roberts; she was covered with petechiæ and had a dry brown tongue, delirium, subsultus tendinum, and hemorrhage from the bowels; she sank in a few days. On examination, extensive ulceration of the intestines was found, as also petechiæ on the internal serous membranes, a bloody serum was effused into the pericardium, fluid was poured into the ventricles, and, mingled with air, was deposited between the pia mater and arachnoid membrane. Air was also seen in the vessels of the brain, the substance of which appeared of a darker colour than natural.

That pus when mingled with the blood is capable of producing

[1] Gendrin, Hist. des Inflam. tom. ii. p. 24.
[2] Müller, p. 755. [3] Ibid.

great commotion in the system, has been proved by Mr. Gulliver, who has lately paid much attention to the state of the blood in inflammatory diseases, and to the effects resulting from introduction of matter into the circulation. In an important paper by him, read at a meeting of the Royal Society on the 14th of June, 1838, he detailed many experiments made on this subject, and informs us of the conclusion derived from his experience that pus can be detected "in almost every instance, either of extensive suppuration or great inflammatory swelling, without a visible deposition of it in any of the textures of the body." In several experiments made by the injection of it into the veins, the pleura, or the peritoneum of animals, a febrile state was quickly excited, proving fatal in many instances: pus, however, was found mixed with the blood in every case in which that fluid was analysed or examined. Mr. Gulliver also mentions that it is very easy to see the globules when mixed with the blood, the addition of a little water and a good microscope being all that is necessary for their detection. In his researches is contained a confirmation of the ideas previously entertained by Dance and others,[1] with the additional advantage, however, of having the means pointed out, by which his conclusions may be tested and verified,[2] but in experiments by injecting pus from the human body into the veins of dogs, the size of the globules and the irritation which must consequently arise should carefully be taken into consideration.

Should the position then be tenable, that many of the phenomena observed in typhus arise from inflammation of the minuter vessels, probably the veins, and from the consequent circulation of the different fluids secreted by such inflammation; and should the arguments from analogy to strengthen my assertions be admitted as conclusive, an important elucidation of the consequences observed in that disease is afforded; and as the progress of the exanthemata conforms in many respects with that of typhus, other fevers of the same species may derive a corresponding explanation; an inflammatory condition and an excitement of the whole system take place, which render every part of the body liable to disturbed action.

The peculiar course and different order of the symptoms observed in the various eruptive fevers show that there is some modification in the virus which produces each, as they distinctly generate their own kind; still they may have some processes in common, others they share with inflammation in general. To follow these ideas would be foreign to my present purpose, although a topic of the deepest interest; it will be enough for me to endeavour to elucidate some of those points which on the one hand connect typhus with similar diseases, and on the other render it distinct. A few words will now be said upon the circulation.

[1] Archives Générales de Médecine, tom. xxiii. xix.
[2] Phil. Mag. vol. xiii. No. 81, September, 1838, on Suppuration.

STATE OF THE PULSE.

In many cases of typhus, the condition of the circulating system as indicated by the pulse is very remarkable, the contractions of the heart being irregular and intermittent, with something unusual and striking in the flow of blood through the arteries. Of this peculiarity notice is taken by almost all the writers to whose works upon this subject we have referred. Huxham says the pulse is inordinatus. Hildenbrand compares the movement of the blood to ebullition; Bateman speaks of it as fluent, and as passing like a stream under the finger. These authors, however, merely show their observation of its existence, without hazarding any suggestions as to its cause, it may therefore seem presumptuous in me to make any attempt of the kind; but without advancing any new theory, it may be instructive to see what light physiology can bring to bear on the subject, and to inquire into those conditions of the system in which similar effects have been observed.

In some cases of this disorder the number of the heart's pulsations is the same as that of persons in health, in some it is much more, in others much less; being sixty in one of my cases, in another only fifty-six, and I have met with it still lower, but it will sometimes mount up to 150 and even more—very frequently to 140. M. Chomel relates that in one instance the pulse was only forty in a minute. Dr. Bateman found it in one case, which terminated fatally, at first 190, afterwards 250; the beats, he observes, were quite distinct, and he was sure of his accuracy, as they were counted both by the apothecary in attendance and by himself. Before making any suggestion as to the cause of these symptoms, the condition of the heart itself must be first ascertained; but though the muscular structure of this organ has after protracted cases been found lax and softened like the other tissues, still it does not exhibit sufficient change to account for its disturbed and eccentric action. We next turn to the brain and spine for an explanation of the anomalies presented by the vascular system, knowing as we do the intimate sympathy between the two nervous centres and the heart: this connection is, undoubtedly, one of the means by which the circulation can be influenced, but there are also other powers which equally control it, and accelerate or retard the flow of blood. It is unnecessary to do more than merely allude to the well known facts that the brain and spine are not immediately essential to the heart's movement, the alternation of action and repose in which Mr. Mayo concludes to be natural to its fibre, or to be the immediate result of its structure.[1]

Dr. Wilson Philip has proved by experiment that the heart's action is independent of the brain or spinal marrow, but he remarks that he could never by chemical or mechanical agents, except by

[1] Mayo's Physiol. p. 46.

crushing the brain or spine, excite any irregularity of action in the bloodvessels; pulsation in them was indeed rendered more or less powerful, but its regularity remained always undisturbed.[1] He also observes, that various agents applied to the brain or spine are capable of influencing the rapidity of the circulation; this shows us how injuries of the brain may affect the pulse: pressure has been noticed by Sir B. Brodie, to render less forcible the contractions of the heart, but not to produce arterial interruption: concussion on the contrary renders the pulse intermitting, irregular, feeble, and perhaps scarcely perceptible.[2] Certain inflammatory conditions of the membranes are also shown, by Dr. Abercrombie, to affect materially the circulating system. Injury of the brain, therefore, may if present, be one cause of the disturbance. But it is not with the brain alone that the heart is connected by sympathy; for "not only the brain and spinal chord, but all the organs in their state of vital action react upon the sympathetic nerve through the medium of the nervous fibrils accompanying the bloodvessels."[3] Hence, then we see how powerful local injury in any part may at once influence the organs of circulation. I have quoted two cases[4] in which it became irregular at the same time that inflammation was set up in the lungs or abdomen. The sympathy between different parts must always be borne in mind in the investigation of any case of typhus, as without this it is by no means easy to affix the proper value to the symptoms exhibited by any viscus: the brain and heart are each sensitive of all that goes wrong in the system, each probably capable of being influenced separately, yet mutually dependent upon each other. From what we see of the causes which render the action of the heart irregular, (which are always injuries, or impressions of a serious nature and depressing kind,) we may conclude that in typhus a very powerful influence is in operation, an influence which seems on other occasions, as we may presume it is in this, a salutary check upon the heart's power, which if even of a natural degree, might prove injurious to the brain or other organs. I shall merely add further, in reference to the influence of the sympathetic, that Muller considers "the modifications which its minute radicles undergo from violent local disease and the reaction of these modifications on the central parts of the sympathetic system, the cardiac nerves and plexuses, as well as on the brain and spinal chord, seem to have a main share in the phenomena which we call fever."[5] This leads me to the last of my present topics, the state of the nervous system in typhus, first observing that an affection of the pulse analogous to that in the disease we are now considering, has been observed in some of the more formidable varieties of scarlet fever.[6]

[1] Wilson Philip, p. 82.
[2] Brodie, Med. Chi. Trans. vol. xiv. p. 375.
[3] Müller, p. 198.
[4] No. 51, 52.
[5] Müller, p. 198.
[6] Willan, p. 140.

NERVOUS SYMPTOMS.

An accurate review of the state of the nervous system in typhus, would involve at the same time an investigation of all the chief diseases of the brain, as we find in the classification of Dr. Bright, that the principal causes of cerebral affections are irritation, pressure, inflammation, and inanition,[1] and this fever presents all the spmptoms of these various disturbances. We see signs of inflammation of the meninges in its various forms, characterised by watchfulness, headache, suffusion of the eyes, or maniacal delirium, ushered in either by a sudden attack of convulsions or by loss of memory, with pain in the neck and limbs, and a peculiarity in the pulse, which at first is slow and varying, but finally extremely frequent. Congestion of the vessels, effusion of serum, lymph, and pus, the consequences of inflammatory action, appear in company with symptoms both of pressure and irritability; the former seen in headache, vertigo, lethargy, and coma, the latter in mental excitement, unattended by bodily disturbance.

We have frequently to combat with inanition coming on very late in the disease, and patients who have passed successfully through all the early stages will occasionally sink at last from the effect of mere debility. The symptoms referable to the head are some of the most urgent, constant, and important that arise; the disease, indeed, commences with more decided affection of this than of any other organ, and it is here, I believe, that the morbid changes of this most formidable malady begin. It is not, however, my intention to enter into all the alterations of the brain, but merely to investigate a few of the peculiarities in typhus, which appear to originate with the head.

Gathering illustration from the phenomena, and knowledge from the treatment, of analogous injuries in other complaints, I shall now consider the symptoms of delirium, muscular tremors, deafness, and the state like mania. The discoveries of modern pathologists warrant our coming to the conclusion that furious delirium and tremors of the limbs arise from the same cause, namely irritation in the membranes of the brain. Sir B. Brodie observes, that "there seems reason to believe that furious delirium and convulsions occur after an injury of the head, under nearly parallel circumstances. The former symptom, like the latter, may, he says, be produced by pressure on the brain, not however by such a degree of pressure as threatens completely to annihilate the functions of that organ, but by that smaller degree of pressure which operates merely as a source of irritation."[2] A similar state is brought on by the abuse of alcohol, nor is a source of irritation wanting in cases of typhus, namely arachnitis, or rather inflammation of the pia mater, attended

[1] Bright, Medical Reports, vol. ii. p. 1.
[2] Med. Chi. Trans. vol. xiv. p. 376.

by effusion. In the cases illustrative of Sir B. Brodie's opinion, irritation was produced by effusion of blood or spiculæ of bone. In real delirium tremens, as also in typhus, it is caused by serum, which with pus or lymph, is often poured out in the latter fever upon the outer portion of the brain. It is barely necessary to add that the excitement and its consequences show the nature of the disturbance to be that of active inflammation.

Many cases of affection of the head with coma, have been accompanied by effusion at the base of the brain, but my own experience does not warrant me in concluding that tremors and furious delirium arise solely from irritation of the hemispheres and anterior parts, or that stupor then only appears when the base is the seat of some morbid change.

Deafness is one of the most constant symptoms; it comes on in many cases early, continues for a long time, is frequently followed by suppuration, but almost always subsides on recovery. When we see so many signs in typhus, which indicate mischief in the brain, and often find on examination after death unequivocal traces of inflammation in the membranes of that organ, we might be inclined to ascribe want of hearing to some organic change within the cranium. But yet there are many circumstances which militate against such a conclusion. For cases not unfrequently occur of partial, nay even of complete deafness, whilst the head remains free from pain, the mind clear, the memory good, and the countenance intelligent. This anomaly has not been overlooked by M. Louis, who attributes it, and I think rightly, to inflammation of the meatus externus of the ear, and not to any internal alteration of organic structure.

The affection of the intellect in patients labouring under typhus, is singularly curious and almost peculiar to that fever: they get into a state of the highest nervous excitement, are full of apprehension, and suspicious of those around them, charge the attendants with intention of destroying them, and refuse to take medicine from a fear of poison: they exhibit apprehension of imaginary danger or anxiety for self-destruction, and unless carefully watched will throw themselves headlong out of a window, or find other means of accomplishing suicide. There is in most the greatest despondency, in others, however, though very rarely, an unusual degree of hilarity. In this fever, what are called the higher faculties of the mind are less affected than the lower: judgment and power of connected reasoning constantly remain when the memory has entirely gone. Hildenbrand states, that being in this condition he conversed about himself with his medical attendants, and made sensible suggestions upon the treatment of his own case; there is, indeed, a connection in the answers of typhus patients with the questions put to them, which is often extraordinary, though they afterwards have not the slightest recollection of what has passed, nor sometimes whom they have seen, though they recognised acquaintances at the time. The nervous system exhibits peculiarities as well during convalescence

as in the earlier periods of the disease; this will appear from perusing the following illustrations.

CASE LIII.—*Where a peculiar delusion occurred during the early symptoms.*

Margaret Halley, aged 26, was admitted into St. Bartholomew's Hospital on the 8th of June, 1838. Her memory was so completely gone that no connected account of her illness could be learned from her. Her pulse was extremely feeble, her tongue furred and dry, her skin covered with small, dusky, red spots. She was reported to have been ill ten days. Although the symptoms were serious, yet her aspect was more peculiar than indicative of mortal ailment. There was a singularly fixed look about her, a strange tranquillity of manner, and an unwillingness to answer questions, which rendered her case distinct: at length the reason for her taciturnity was found out; she believed that she was already dead, that she had been so indeed for many days, and her constant request to be buried was impressive and painful. In this condition she remained stationary for about ten days, when she began to improve. The idea of being a corpse gradually departed, and she became convalescent and well.

CASE LIV.—*With mental derangement remaining after febrile action had ceased, but gradually and completely subsiding.*

Hannah Spelman, aged 19, a servant, came into St. Bartholomew's Hospital, on the 29th of January, 1838; she had been ill a fortnight, her complaints began with shivering, followed by flushing, pain in the head, and vertigo. About five days before her admission she became delirious, and continued so up to the time when she was brought to the hospital. Her state was then as follows:—countenance flushed and anxious, eye bright, conjunctiva suffused, pain in the abdomen increased by pressure, bowels constipated, thirst excessive, skin hot and dry, tongue dry and furred, pulse feeble, 96. There was great nervous excitement about her, but she answered questions rationally and well. On the 29th she was so noisy and furious as to disturb the whole ward, to alarm the other patients, and to render it necessary that she should be removed to a separate room: she fancied that the nurses were bent upon doing her injury. Her answers to questions were pertinent, but she muttered and talked incoherently when her attention was not excited by being spoken to. She continued nearly in the same state for a fortnight, her evacuations during which period were passed involuntarily. After this the febrile symptoms subsided. Her skin, pulse, and tongue returned to their natural and healthy condition, but she obtained very little sleep at night; her looks were wild, and her actions so little under the control of reason, that it was necessary to employ restraint to prevent her from doing injury

to herself or others, as also from tearing her bed-clothes. After some weeks, however, she gradually but completely recovered, so as to be able to leave the hospital free from any bodily or mental ailment.

CASE LV.—*With temporary delusion during convalescence.*

Mary Anne Collins, aged 13, whose mother and sister were both at the same time ill with typhus fever, was admitted into St. Bartholomew's Hospital, on the 24th of August, 1837. She had been unwell a week. Shivering, pain in the head, thirst, and loss of appetite had been the first symptoms of her attack; those on her admission were a heavy look, great thirst, pain in the head, suffusion of the conjunctiva of the eye, tongue moist and thickly furred, skin hot and spotted with a rash, pulse soft, 120. On the 25th the tongue was furred, dry, and brown in the centre. The pain in the head was worse, she was drowsy, and the pupil of the eye did not readily contract. On the 26th the rash was more abundant, she complained of pain in the chest, but nothing morbid could be detected by auscultation. On the 27th she was free from pain, but there was some ronchus in the lungs. She then began to improve, and on the 6th of September seemed well. A day or two afterwards, however, she appeared strange in manner, singularly calm, her countenance did not exhibit any animation, the features were fixed, and when spoken to, she answered in a few words without regarding or turning towards the person who addressed her; she fancied for several days that persons whom she knew and accurately described had been to see her, whereas no such visiters had been in the ward, nor could she by any possibility have seen them. This condition subsided in a few days, and she was discharged on the 12th of September.

CASE LVI.—*Terminating in temporary insanity.*

Ann Taylor, aged 22, the wife of a patient with typhus, was received into St. Bartholomew's Hospital, on the 19th of June, 1837, having been ill four days with pain and giddiness of the head. When admitted, she had pain in the head and back, suffusion of the eyes, dulness of the countenance, numerous small red spots on the trunk and extremities, relaxed bowels, watery evacuations, a hot dry skin, and a furred tongue.

On the 21st, hemorrhage from the uterus came on, she passed a restless night, and on the 22d complained of an increase of pain in the head; at 12 o'clock on the 23d, her mind began to wander; on the 27th she was delirious, and talked a great deal. On the 28th her pulse was 140, though with little power, but on the 30th it sank to 80, and she became calm and collected, and continued so till the 2d of July, when she was again restless, and so much disposed to violence as to require restraint, and continued in a state

of mania for the remainder of the month; she slept little, being constantly talking or singing, yet her skin, pulse and tongue were in a natural state, her aspect not unhealthy, and her appetite good: on the 30th of September she was removed by her friends, her bodily health being restored, but her mind remaining disturbed.

After leaving the hospital, this patient was removed to a lunatic asylum, where she remained some months, and then miscarried; after this she returned home convalescent, and was in perfect health on the 20th of July, 1838.

It will not be uninstructive or without its use to refer to a case or two, where, during delirium, patients have effected their own destruction. Rasori mentions one, that of a young soldier who threw himself out of window and was killed. No other explanation of the following attempt at suicide, which unfortunately proved successful, could be found, than that a sudden inclination to destroy himself had come over the patient during delirium.

CASE LVII.—*Self destruction during fever.*

Johan Thorberg was admitted on board the Seaman's Hospital, on the 11th of August, 1831. He was feverish, and had no appetite, pulse 100. There were but slight symptoms of ailment about him, and he was put on a simple fever plan. On the following day, without the least apparent cause, finding himself unobserved, he leaped through the hawse-hole at 9 A. M. and was drowned.

The notes of a case admitted under my care into St. Bartholomew's Hospital have unfortunately been misplaced, which refer to a man about 40 years of age, who was taken in labouring under all the well-marked signs of the prevailing typhus. When I first saw him, he was lying on his back, strapped down, being delirious, yet returning rational answers to every question that was put to him. He appeared to improve for a few days, when great tremors of the limbs came on, with disturbance of the sensorium, and tympanitis of the abdomen. He died on the sixth day from the time of his admission. The account which we received from those who brought him was, that he had thrown himself from a two-pair of stairs window into a paved yard, and was found sitting up apparently little hurt by his fall. The account of what had happened no doubt was substantially correct, as, on examination after death, his liver was discovered to have been ruptured; a large rent was found in its substance, with a considerable clot of blood in the abdomen. The case was interesting, as illustrating the comparatively slight constitutional symptoms which result when the brain is in a state of excitement, and the length of time which a person may live after a serious local injury. It will not, I think, be disputed that the circulation of the brain is disturbed in typhus, as the changes after death bear out what is indicated by the symptoms during life. Post mortem examinations disclose, in many cases, considerable vascularity of the meninges—in short, decided inflammation of the mem-

branes, but no doubt of the modified character which is met with elsewhere. This, however, must have some effect upon the circulation within the brain, must impede, or at least essentially interfere with its force and regularity. An attack of irritation of the pia mater, should the vessels be but simply enlarged, if arising on a sudden, must necessarily produce great disturbance, both directly and sympathetically. Should the irritation go on to positive inflammation, there will be still further enlargement of the diameter of the vessels, and an impediment to the passage of their contents; the heart, sympathising with the brain, will send less blood in that direction: and thus we are furnished with an explanation of two important symptoms in typhus—utter prostration of strength, and great cerebral excitement.

The head is found in all cases to be more or less the object of attack; we know indeed this to be the organ most completely disturbed in the course of the fever, and, as far as we can judge by symptoms, it is the part which is primarily affected. What pathological investigation can discover as to the exact condition of the brain in cases of disturbed function after fever has subsided, I am happy to say is unknown to me; having as yet never seen a patient who has sunk under these circumstances. We may, however, fairly presume that the excitement arises from increased vascularity, as it resembles a condition in a class of cases related by Dr. Abercrombie, which, he observes, are likely to be mistaken for mania or hysteria. There is a similar state of the brain when violent mental emotion of a depressing character is succeeded by proportionate excitement; or when cerebral disturbance comes on after parturition. When this condition arises idiopathically, it very generally proves rapidly fatal, but in all these cases post mortem examination can detect nothing but increased vascularity.[1]

ON THE MORBID CHANGES IN TYPHUS.

Much has been said by anticipation on this part of the subject; and in quoting cases to show the consequences of the infection of typhus, as displayed in the inflammation of internal as well as external parts, in the formation of matter, and in the ulceration of mucous membranes, it may appear that this head has already been fully considered. Still some topics remain which belong appropriately to this place, and have not yet been mentioned.

It is stated by Morgagni, that "of all diseases, fever presents itself under the greatest diversity of form. In most of the cases selected from the papers of Valsalva, it may excite surprise, that, after violent febrile affections, scarcely any morbid appearance is discoverable which bears a proportion to their violence, and sometimes there has

[1] Abercrombie on Disease of the Brain.

been no apparent lesion."[1] Typhus fever is by no means an exception to this general rule, although it not unfrequently happens that there is injury to a great extent. I have met with several cases in which no morbid change was perceptible to our ordinary methods of investigation. The remarks of Morgagni are repeated by Dr. Armstrong, who says, "that in some cases of typhus the morbid appearances are not sufficient to account for the unfavourable issue; and we are almost compelled to infer that it chiefly depends upon an actual exhaustion of the vital principle, induced by the preceding excitation." And again: "Typhus undoubtedly begins and terminates without topical inflammation."

While the disorder will thus, on the one hand, run its fatal course, without leaving any obvious track to mark its progress, and as it were to prove its identity; it exhibits, on the other hand, a series of changes and disorganisations, which show but two clearly that no portion of our frame is secure from its reckless invasion. My object, however, is not to enter into a lengthened detail of morbid changes; nor to investigate minutely the appearance assumed by each in its progress. Such a recital can be neither necessary nor instructive, as many of these changes are the result of one process, have a common cause for their production, and tend to similar results, varied merely by the local circumstances; inflammation in short, is excited in different parts. My object will be to class these changes in large groups, and to treat of them generally rather than individually, arranging them under the heads of vascular system, glandular structure, membranous tissues, and parenchyma of organs.

The effect upon the vascular system is placed first in this series of changes, because here I believe is to be found the first link of that chain of events which finally becomes so entangled and so difficult to unravel, without the regular succession is clearly understood, and the dependence of one part upon the other is proved and admitted. Under the head of the vascular system I shall place the blood, as well as its vessels; and the blood will be noticed, first, with the view of ascertaining how far we are justified in concluding that the primary symptoms in typhus are due to changes in this fluid, and, secondly, as to what is the state of our knowledge with respect to its actual condition.

The poison of typhus, as I have endeavoured to prove, occasions irritation of the minute bloodvessels; and a stimulus similar in its operation, but different in itself, produces, as I imagine, the other exanthemata. The poison which excites them may enter the blood by inhalation, by absorption, or the blood may be contaminated by a wound; but this alone is not enough to give rise to typhus, or any of the eruptive diseases. Something more is required: there must be a local impression for its commencement; this must be upon the inner lining of vessels, for how else can the consequent actions be produced? such we know to be the result of other stimulants, and

[1] Cooke's Morgagni, Lond. 8vo, vol. ii. p. 581.

the consequences are all confirmatory of such a beginning. We see this illustrated in inoculation, in vaccination, and we know by the action induced whether the disease has taken or not. Many at the present day are disposed to consider alteration in the fluids as the sole cause of the phenomena witnessed in disease; by others, on the contrary, the fluids are still looked upon as nearly inert. M. Broussais indeed maintains that we can only act on the fluids by first modifying the action of the solids, and hence that no good can result by analysing the blood, and ascertaining its peculiarities in typhus. In the specific infectious diseases, measles, small-pox, and scarlet fever, the system appears incapable of receiving the poison more than once during life. Now, if the alteration of the circulating fluids were the only cause, and chemical changes there induced the occasion of the after symptoms, we might surely expect to find the fluids capable of such an alteration many times during life. The fluids must be perpetually changing, if not by the ordinary processes of nutrition, secretion, and excretion, at least after large depletions and repeated losses of blood by different causes, such as spontaneous hemorrhage, venesection, or cupping: and blood thus renewed would be capable of receiving the same chemical changes again and again; but the nervous system is clearly altered in its sensibility to certain stimuli. We well know how different is the susceptibility of the nerves at different periods of life, and we can far more readily suppose that the infection of small-pox fails when the system has been once infected, from inability of the nerves to receive the necessary impression, than that the new blood should be insensible to chemical agency. Another argument in favour of the belief that the constitutional symptoms arise from an impression on the vessels, and not merely from changes in the fluids, is to be found in the fact that the system may be fully saturated with a poison, and yet exhibit no external symptoms of its presence, and that the fluids may be so impregnated as to convey it to others, and yet the person primarily infected remain unconscious of its existence. There are many known instances of persons who have died at advanced ages from natural decay, induced solely by time, who never had small-pox, although their systems were many times polluted with the virus by inoculation. Among my own acquaintances is a gentleman now 70 years of age, who has hitherto resisted all infection by small-pox and vaccination, both natural and artificial.

We know that in some diseases one attack serves as a protection against another. How can we explain this, except by supposing that the solids are insensible to the stimulus. If the changes were in the blood alone, we must conclude that this fluid constantly renewed, as we know it is, must have properties imparted to it which seem more properly to belong to the nerves. That the system may be charged with this virus, and yet not exhibit its effects, is shown by the well-authenticated history of a lady, who, being in the family-way, was exposed to the contagion of small-pox, but was not affected at the time, except by disgust at the sight of a person suffering

under that loathsome disease. She shortly afterwards gave birth to an infant, which went through all the regular stages of small-pox. This case well exemplifies the possibility of a person being infected, but not attacked, and yet capable of conveying a disease to another by means of the circulating fluids. Similar instances are related in Duncan's Medical Commentaries.[1] The case of the lady just alluded to is related by Dr. Jenner himself in the first volume of the Medico-Chirurgical Transactions, in which he mentions two other analogous incidents. M. Rayer gives us corresponding instances, and quotes cases in which the fœtus has been born covered with well-marked variolous pustules. In these instances we find the blood of the mother impregnated, yet producing no effect in a system rendered insusceptible by former attacks.

What takes place when inoculation is practised would confirm the idea that an irritation of the vessels precedes the general symptoms; for the consequences induced by the introduction of the poison into the blood is not immediate, as when a chemical change has been induced in it, or when any powerful impression has acted upon the nervous system. And, indeed, we know that when there has been an absorption of poison, positive local changes do actually occur; for instance, when by vaccination the virus of cowpock has been introduced into the arm, "the vaccinated part presents no appearance of change till the third and fourth day; the pustule enlarges on the sixth, seventh, eighth and ninth day; on the tenth the turgid circumference of the pustule continues to spread, the areola acquires a diameter of from one to two lines, and the part of the skin upon which it is developed occasionally becomes indurated and very much swelled. * * * The person vaccinated experiences a biting heat and violent pruritus in the part affected, and a sense of weight and pain, which occasionally extends to the axillary glands and the whole of the arm."[2] Here the local irritation clearly precedes the constitutional disturbance; some degree of fever, with restlessness, and acceleration of pulse, subsequently ensues.

So also in the inoculation for small-pox, on the second day a stain appears about the incision; on the third there is a papular elevation of the cuticle; on the fourth a vesicle is formed with a depressed centre, and a sense of itching is perceptible in the part; on the following day (the sixth) pain and stiffness are felt in the axilla; but on the eighth day the constitutional symptoms usually begin to appear, with rigors, headache, &c. Besides a contamination of the blood produced by the vaccine or variolous poison, there must also, I imagine, be irritation of the vessels, either veins or lymphatics, as otherwise it is difficult to account for the swellings in the arm and axilla, and the local irritation, which invariably precede disturbance of the system.

The almost certain order of the phenomena in typhus shows that the chief seats of the disease are involved by it in regular succession.

[1] Vol. xix. p. 260. [2] Rayer, p. 447.

There is, first, an affection of the head, then of the skin, afterwards of the lungs, and, lastly, of the bowels; which regular implication of different organs would lead to the inference that irritation rather travels through the vessels, than is excited by an impression from the blood, which would act nearly simultaneously on all parts of the vascular parietes. It is scarcely possible but that medical men, students, nurses, and others in attendance upon typhus patients, must almost daily have their systems saturated with the infection. Dr. Heygarth supposes that the distance at which diseases can be communicated by infection extends only to a few yards; but even this distance can never be kept between a medical man and his patient. The pulse must be felt, the state of the abdomen ascertained by pressure, percussion of the chest and even auscultation must be performed, and that not only at the back, but in front, and as well at the lower as the upper lobes of the lungs; and here again anxiety to arrive at truth, and willingness to bring all our own senses to aid the investigation, induces us often to throw aside the stethoscope, and, that the ear may not possibly be deceived, it is at once brought into contact with the body, separated from it only by a fold of linen. Since then the hand of the practitioner is actually in contact with the skin of the sick, since he can scarcely avoid inhaling breath just emitted from the disordered lungs, and remains at each visit many minutes in the vicinity of the patient's bed, there can be no shadow of a doubt but that his system must become charged with the virus; especially when he examines not one case a day, but many, not on one day alone, but every day for weeks, for months, nay, for years together. Stating then the facts respecting the part which the blood performs in the earlier periods, we find that the poison may, and probably does, enter the system with the breath, and so comes in contact with the minuter vessels: if they be insensible, then no mischief results, and, unless local change takes place, the poison will be ejected from the system, for there does not seem any accumulation, at least as far as I have been enabled to observe. One single impression or exposure to the contagion of typhus is just as likely to produce a severe attack as a constant attendance upon those labouring under it; and without a decided effect, we do not find any sign of disorder; there does not seem any such condition induced as would result from a slow action, or such as arises from exposure to noxious vegetable exhalations, the effect of which we see depicted in the countenances of those exposed to the continued action of malarious poison. There appears no immediate state between being free from typhus and being decidedly infected with it. The period of incubation is sometimes indeed protracted, but not often, and even then a decided feeling of illness is experienced, although the person is yet able to pursue his ordinary avocations.

I know not how to explain the fact that the course of this disease can at once be cut short by medicine, unless we are willing to admit the immediate agency of the nervous system. Emetics administered, in cases which I had every reason to believe would have

proved typhus, seemed to avert that disease in 1831.[1] Dr. Currie, whose authority will not be questioned, says that he succeeded in checking that fever in twenty-six cases by the cold affusion, when it broke out among the men of the thirtieth regiment, quartered at Liverpool in the year 1792,[2] and he relates a case in which scarlatina was put an end to by a similar mode of treatment, even without the appearance of the rash.[3] In Dr. Marsh's treatise on the origin of fever, it is stated that hooping cough has thus received an immediate check by the administration of an emetic; and allusion is also made to the case of small-pox thus suddenly arrested.[4] Dr. Bateman remarks that he was able to reduce this febris maligna to a febricula of five or six days by the use of emetics, which in two cases put an immediate stop to the febrile symptoms.[5]

It is not easy to explain the effect of mental emotion in apparently producing this disease, unless we are willing to admit the existence of a change in the nervous system, the part of our frame destined to the reception of impressions: the action of stimuli in enabling persons to resist infection, and the modus operandi of certain debilitating means which invite it, are equally curious and inexplicable, except upon such an hypothesis. Admitting then that the blood becomes infected or diseased by the admixture of the germ of the disorder in the case of eruptive fevers, and that by this means the poison is brought into contact with parts sensible to the impression, I conceive that it is essential for the production of the phenomena of these disorders, that disturbed vascular action should be produced, which again would be dependent upon nervous influence.

Leaving now this point, which will perhaps remain a source of medical schism to be discussed by theorists, it is incumbent upon me briefly to touch upon the actual changes in the blood and the vessels of circulation.

CHANGES IN THE BLOOD.

Although difference of opinion may exist as to the part of the system first affected in typhus, and though doubt may be entertained of an essential change in the fluids preceding local disturbance or the constitutional impression, yet few will hesitate to allow, that in the progress of typhus the blood undergoes a material alteration. In the present state of our knowledge concerning the result of injuries to nerves, we cannot but suppose that an agent powerful enough to depress the nervous system, and seriously to disturb its functions, must also in a great degree affect the fluids, either directly by the

[1] Account of Typhus, by the author, p. 8.
[2] Currie's Med. Rep. vol. i. p. 15. [3] Ibid. p. 64.
[4] Marsh on the Origin of Fever, Dubl. Hosp. Rep. vol. iv. p. 532.
[5] Bateman, p. 93.

influence of the nerves over them,[1] or indirectly by an alteration in the secretions.[2] The blood consequently experiences a very early and essential change; and although inflammatory symptoms are present, yet when drawn from the veins, it is materially different from that which is usually found in the first stage of inflammatory fever—it certainly in many cases does not buff, or cup; sometimes it does not coagulate; at other times it appears fluid, and readily allows the red particles to subside, and occasionally is completely diffluent: all which appearances are quite contrary to what we find in acute inflammation. Now we are aware that the coagulation depends upon the presence of fibrine; and that inflammatory blood contains an unusual proportion of this principle;[3] which is not only supposed to be in excessive,[4] but also to possess an increase in its plastic property.[5] Hence the conclusion necessarily follows, that the constituent upon which the coagulation depends, is either much diminished or extremely modified. Authorities have already been quoted to show how the blood may be deteriorated from many causes plainly in operation during this fever; and should there be any foundation for the supposition that disordered secretions are poured into the blood from the vessels themselves, we shall find no difficulty in amply accounting for its unhealthy state.

It is only by the supposition that some change of an injurious tendency takes place in the circulating fluids themselves, that we can offer an explanation of the symptoms by no means uncommon in certain cases during the prevalence of epidemic typhus. The cases to which this allusion refers, are those in which a fatal termination takes place about the third week, when the patients for a considerable time have been in a lethargic state, but are conscious when roused, and declare themselves free from pain. No one organ appears to suffer in an essential degree; the skin is perhaps hotter than natural, the pulse feeble, the tongue dry, hard, and black; the breathing may possibly be somewhat hurried, but auscultation can detect no disease of the lungs, nor is there any indication of essential mischief in the abdomen. Patients in this form of typhus will often take nourishment, and occasionally exhibit signs of amendment. The fatal termination of these cases is very mortifying, as it is impossible to avoid entertaining expectation that they will terminate in recovery; there seems indeed no reason for an unsuccessful result; there are no symptoms of essential organic change to occasion it; no great excitement to exhaust the powers of life; still a serious constitutional disorder is excited, which our remedies are unable to remove, and which the efforts of nature are obviously quite inadequate to oppose: nor do examinations post mortem, in

[1] Andral, i. 543. [2] Ibid. 560.

[3] "The serum is more viscid, this arises from its containing nearly double the usual quantity of albumen which it did in the healthy state."—Annals of Philosophy, 1823. Gendrin, vol. ii. p. 442.

[4] Müller, 117. [5] Carswell.—*Art.* "Inflammation."

these instances, throw any light upon the cause of death; no decided alteration points out one organ as the seat of changes incompatible with life: nay, as Morgagni has expressed it, there are few circumstances in fever more extraordinary than the frequent absence of any ostensible cause for death. Some essential alteration must however have been in progress during all the period of the disease, which tended so directly to a fatal result. What the exact changes in the blood are, is yet to be ascertained; but if not otherwise diseased, it is less disposed to coagulate, looser, and there are certain morbid alterations dependent upon its softened condition. Mons. Andral refers to it, distinctly, the enlarged and pulpy state of the spleen, which he considers to be one of the anatomical characteristics of continued fever, with what he calls adynamic symptoms. Mons. Louis found, that out of all his cases of typhus, the spleen was healthy in four cases only; in some it was five times its natural size, and of a red blackish or deep blue colour.[1]

This alteration in size and texture has been observed in the disorder of our own country; it may be detected if the left hypochondrium be examined during life, and is probably the cause of uneasiness complained of in that situation. The liver has been found soft, owing to the state of the blood,[2] and from the same cause the muscular structure of the heart becomes flaccid,[3] which change indeed will be generally perceived throughout all the tissues. To this disordered condition of the fluids may be attributed effusions of blood in the later stages of the disease. Hemorrhage very often takes place from the bowels, originating in an ulcerated portion of the intestine, but undoubtedly in many cases it arises from the vessels without any abrasion of surface. MM. Louis and Chomel have noticed that the muscular fibre is soft and without tone, but not the seat of hemorrhage as occasionally happens with us.

OF CHANGES IN THE VESSELS.

M. Louis states that in more than half the cases examined by him, the lining membrane of the heart was livid or violet coloured, and that the muscular structure exhibited the same appearance.[4] The inner coat of both arteries and veins is very often both in typhus and other essential fevers of a deep red colour. This in most cases proceeds from mere straining, but has been observed to arise as well when very intense inflammation has been excited, as when there has been some sort of dissolution of the blood.[5] We may in general refer this redness to the dyeing of the membranes

[1] Louis, p. 313, 323.
[2] Chomel, 267.
[3] Precis d' Anat. Patholog. vol. ii. p. 1, 420.
[4] Bichat, Anat. Gen. tom. 2, p. 160.
[5] Louis, p. 323.

by the colouring matter of the blood, for it is often found to be confined to situations where blood has remained in contact with the discoloured portion, and to be restricted to parts in a depending position. We are told, however, by Bichat, "that the redness of the arteries in some cases of fever cannot be referred to staining either from within or without, and he maintains that it must still be a question whether this should be considered as disease or not."[1] While thus the nature of appearances in the larger vessels is doubtful to those well qualified to judge of them, it will not be surprising that the alteration of minuter ones should be still more in obscurity. Inflammation, which is produced by irritation of the capillaries, is certainly often excited. Muller sums up its leading processes, by remarking that "the blood is attracted in increased quantity to a part in this state, and escapes from it with great difficulty;"[2] but he does not say what is the exact condition of the vessels themselves, nor how far the changes which take place in them are occasioned by action, if any, in their parietes. It may be appropriately observed, when offering a conjecture upon the condition of the vessels in any class of diseases, that much difference of opinion exists among physiologists as to the very first step in that most common process, inflammation; Muller imagines that when this is established, the circulation is slower, but Mr. Lawrence considers that "there is increased activity of the vessels of a part; yet not a state of increased activity merely, but increased activity altered in its mode."[3] Dr. W. Philip's opinion is that "the blood in the capillaries begins to move more slowly: these vessels in the same proportion suffering a degree of morbid distention: and this often goes on till they, by many times, exceed the healthy diameter, and the blood, in the most distended, ceases to move altogether."[4] Dr. Thomson, observes, "that the velocity of the blood, so far from being always diminished in inflamed vessels, is often increased, particularly in the commencement of inflammation: and that this increase of velocity may continue in the capillary vessels from the commencement to the termination of that state:" and further, "that a diminished velocity in the circulation through the inflamed capillary vessels may take place in the very commencement of inflammation, and may continue during the existence and progress of that state."[5] So great then being the difficulty of ascertaining the exact condition and rate of circulation in an important portion of the living system during reparation of the simplest injury, we cannot expect more clearly to demonstrate its operations in the highly complicated phenomena of fever. When, however, we see in exanthematous disorders, great turgescence of minuter vessels, we cannot but ascribe much of the disturbance of the circulation to

[1] Gendrin, Hist. Anat. des Inflammat. tom. 2. p. 6.
[2] Müller, p. 231.
[3] Lectures on Surgery, Med. Gaz. vol. v. p. 161.
[4] On the Vital Functions, p. 292.
[5] On Inflammation, p. 88.

their dilated state: this excitement, moreover, arises in membranes which are as important from their situation and office in some cases, as in others from their extent. Should the inner coats of vessels be secreting surfaces, they must necessarily, when in an inflamed condition, pour forth various fluids, which mingling with those previously circulating, will materially affect their properties and effects. An external agent or poison, admitted from without, provokes the exanthematous disorders, the minuter vessels are obviously and immediately excited, and we are entitled to suppose that all the consequences of this state will follow. What those consequences are, the analogy of similar organs will point out to us. What is the anatomical character of the lining of the arteries and veins? A serous membrane, or one nearly allied to it: such at least is the opinion of J. Cloquet,[1] Mayo,[2] and Meckel.[3] What must result from increased action in such a part? Undoubtedly the ready and abundant secretion of albuminous fluids, serum, lymph, or pus. In surgery, the result of inflammation of vessels is duly appreciated. Am I wrong in asserting that it is too little regarded in considering medically the causes of fever and general inflammatory disorders. Bichat, it is true, points out some differences between the lining membrane of the heart and bloodvessels and the serous membranes, one of which is brittleness; and notices some points of distinction in the lining membrane itself, in various parts of the vascular system, where, doubtless, important peculiarities exist. He then alludes to this membrane as a secreting organ, and expresses a "suspicion" that the fluid which is found lubricating it may be derived from the blood, and that when the opposite sides of the vascular tubes come in contact they form adhesion, not by effusion of lymph, but simply by the approximation of the membranes themselves.[4] We know, however, that all those secretions which serous membranes pour out, and which serve to characterise them, are furnished in abundance by the inner coating of arteries and veins, and that "of all textures the serous membranes are most prone to the effusion of liquor sanguinis."[5] Why then should we imagine that when a part is excited and inflamed by the small-pox virus, or other poison, the serous lining of the vessels is perfectly passive, seeing as we do how other sources of irritation make such membranes pour out their secretions in abundance. They generate pus and lymph in profusion when excited by external irritants, and there is nothing extravagant in supposing that poisons acting upon them may be attended with similar results. No doubt the observations of Bichat as to the different functions of various parts of this inner tunic of vessels are important and true; indeed, we know that the lining of arteries most readily yields fibrine, while serum and pus are most abundantly furnished by

[1] Cloquet, Man. d' Anat. descrip. Paris, 4to. 1825. p. 377.
[2] Mayo, Physiology, p. 48.
[3] Meckel, Anat. Gen. tom. i. p. 131.
[4] Bichat, Anat. Gen. tom. ii. p. 51.
[5] Müller, 415.

veins. In some disorders, nay, in inflammation itself, we have been informed that fibrine is found in great quantities.[1] Whence does the blood receive this supply? The lining membrane of the arteries may not be its source, but is capable of affording it. Let us see whether the ideas which I have ventured to suggest, can explain any of the hitherto puzzling phenomena of disorders where the albuminous principle is in excess: let us take rheumatism for an example. What are the leading features in this complaint? Are they not all the symptoms which would result from highly stimulating blood, or from inflammation rapidly changing its seat? Have we not the most copious effusion of fibrine? Is not the lining membrane of the heart one of its frequent seats? Is not the pericardium also very frequently lined with this effusion? Do we not find the valves of the aorta often coated with fibrinous deposits? The question may fairly be entertained, whether or not the vegetations found in this situation arise from exudation; it may be asserted that they are deposited by the blood itself when filling the valves, which for a time must remain motionless, turgid, and capable of receiving a deposit or sediment, while the distention and elasticity of the aorta are forcing back its contents and keeping the valves closed until the heart's next contraction. This argument, however, would apply to other valves besides those spoken of, while we know that these vegetations are seldom met with except at the entrance of the aorta. I have removed these growths with care, and candidly admit that I could not discover any irregularity of surface or vascularity of membrane beneath them, nor could I trace any continuity of vessels. But in the cases where this was done they were quite recent, and we know that it is not necessary that there should be redness of the serous membranes even when in a state of inflammation, as we see exemplified in one form of peritonitis, when "the peritoneum is quite pale."[2] But returning from this digression to my narrative, the next subject to be treated of is the

GLANDULAR SYSTEM.

Under the above head it is obvious that parts having various functions must be classed together, the parotid gland for instance, and the glands of the small intestines; the one furnishes an important secretion through pervious ducts, the others exhibit no obvious passage: but still, though differing from each other in structure, they are equally liable to organic changes, and may therefore be considered at the same time. The high authority of MM. Chomel, Louis, and Bretonneau, has been exerted to prove that the essential organic lesions in typhoid fever, arise from certain changes in the glandular follicles of the mucous membranes in the small intestines.

[1] Andral, i. p. 530.

[2] Gooch, on the Diseases of Women, p. 35.

Now I have already observed that inflammation of the intestinal canal, when accompanied by ulceration, is one of the causes of phlebitis, and gives rise to a train of symptoms which indicate presence of matter in the circulation; and here again I may express my belief, that many cases are looked upon as typhus, which arise, it is true, from irritation of the vessels, but differ in their origin and course from that infectious disease, which alone should be so designated. In my experience, inflammation of the glands of the intestines is by no means a constant accompaniment of that form of typhus fever which is commonly met with in our country; it does however, occasionally take place. Dr. Bateman, remarks, that there is one kind of diarrhœa which occasions a protracted disease, of which ulceration of the intestines is one of the consequences.[1] Dr. Abercrombie, Dr. Alison, Dr. Duncan, and many others, have noticed it in connection with fever. Dr. Bright has described and admirably depicted it. Hildenbrand observes, that pain in the abdomen comes on in the second stage, arising, as he says, from inflammation of the bowels, which is invariably present at this period of typhus. When it does occur with us the course it follows conforms accurately with the description of M. Chomel, who clearly fixes the commencement of the organic changes in the viscera upon the glandular portion of the intestinal canal. He observes that the alteration of structure in these parts follows a definite course, both in its beginning, advance, and also in its progress towards reparation. The glands chiefly affected are those of Peyer,[2] and those situated near the ileo-cæcal valve are the first to take on a disordered action. Ulceration of the intestines is consecutive upon the glandular disease, and this, extending upwards from the termination of the ilium, occupies a space of from two to eight feet. When recovery takes place, resolution begins in the part first affected, and reparation proceeds in the same order as the disease advanced. M. Louis states, that there are two forms of alteration in these patches of glands, one of which is characterised by a peculiar deposit which is absent in the other. In speaking of that variety where there is

[1] Bateman, page 46.

[2] The term Peyer glands is here used, as that is the common denomination of certain patches chiefly found at the lower part of the small intestine. Müller observes that the nature of these thickened, generally oval, patches of the mucous membrane has, up to the present time, been quite unknown; and he notices their increased importance from the morbid changes, suppuration, and ulceration, induced in them in typhoid fever attended by affection of the bowels. He then enters into their description, and states that besides the follicles of Lieberkuhn, and the villi found here as in other parts of the intestines, there are circular white spots, about a line in diameter, slightly raised, and that no secretion could be expressed from them. On rupturing the surface of one, a cavity of a corresponding size appeared, containing grayish matter, composed of granules smaller than the ordinary particles of mucus. The membrane which covered the cavity was extremely thin. It appears then that there are no large follicles with open mouths or cells in the patches of the so-called "Peyer's glands," but merely sacculi, of which the nature is unknown.—Müller, page 496.

no deposit, he says, that it exhibits various degrees: in the first place, the patches of glands and the mucous membrane in its immediate vicinity only present an exaggeration, as it were, of the natural structure, a distention of which is then induced with a slight softening and redness; this state is common, both to the mucous membrane and the cellular tissue. As the morbid changes advance, thickness and redness increase, the mucous and cellular tissue become so united that they cannot be afterwards separated; ulceration next takes place; this is some cases is superficial, the mucous membrane being only partially destroyed; in others, however, deep ulceration exists with total disorganisation: occasionally a whole collection of glands is destroyed by a single ulcer, many of which, in other instances, appear simultaneously, and consume the patch by their united efforts. When the mucous membrane has been removed by ulceration, the muscular becomes implicated, and finally the peritoneal coat is involved in the common destruction. The edges of the ulcer, which assumes a round or oval shape, are occasionally perpendicular, at other times slanting. The second form of the glandular affection differs from that above described in the mode of alteration of the sub-mucous tissue. In this variety a peculiar deposit is found, in addition to the simple inflammatory action, a pale or yellowish red unorganised substance, from two to three lines in thickness, is secreted. This effusion is poured out between the membranes; for M. Louis notices, that on making a perpendicular incision through them, the submucous tissue may be seen diverging so as to enclose it. To this last species he applies the term hard, to the first he gives the appellation soft.[1]

The membrane over the patches of glands sometimes puts on an appearance termed pinked (gaufrée,) which has been declared peculiar to typhus, but this again is said to be by no means invariably present.[2] Considerable doubt arose at first in my mind as to whether the disorder described by MM. Louis and Chomel, under the name "maladie typhoïde," could be that which Hildenbrand has denominated typhus. Can a fever almost invariably presenting in one country ulceration of the bowels, be very nearly free from it in another? Are France and England so unlike in climate and mode of living, as sufficiently to account for this difference? But the impression on my mind, arising from the correspondence between the leading features, as already detailed, is that the two fevers are identical. From what MM. Louis and Chomel have themselves advanced concerning the affection of the bowels, statements may be found in opposition to the views which these writers have taken on the subject. It is with great deference that I venture to put forth an argument against the assertion of such authority, that "certain changes in the glands, producing ulceration in the mucous membrane of the bowels, commence with the disease, are inseparable from its existence, and that all other changes are consecutive to

[1] Louis, Recherches, pp. 198, 207, 449.

[2] Chomel, p. 222.

this." Now typhoid symptoms coming on during inflammation of the bowels, I should consider to arise from phlebitis and not from typhus; but I am induced to think that the cases described by M. Louis, were typhus, and not inflammation of the bowels, because he admits that in some instances there were the symptoms of typhus, but that the pathognomonic alteration of the mucous membrane of the intestines was absent: to this fever he gives the name of false typhus (typhus simulée).[1] As my object is to be as concise as possible, it will only be observed in addition that M. Louis furnishes us with another argument against the fact that the symptoms called typhoid arise simply from ulceration of the bowels; for he has mentioned other instances, in which patients sink without typhoid symptoms, yet have the peculiar changes in the intestinal canal: to this fever he gives the name of latent typhus (typhus latente).[2] These facts could not escape the eye of his critical adversary, who points out their inconsistency, and further objects that according to M. Louis's theory, a disease can only be ascertained to have been typhus at the post mortem examination of a patient.[3] In alluding to the controversy between two members of our profession so highly gifted as MM. Louis and Broussais, we must regret, that in the endeavour to advance science and establish truth, any other expressions should have been employed, than France in her most chivalrous days would have sanctioned between two noble opponents.

M. Chomel, who also regards the changes in the glandular tissue to be the cause of the symptoms in typhus, says that the changes in the intestinal follicles are constant, or *almost* constant; he quotes a case, however, where there was no affection at all of Peyer's glands, and allows that occasionally there was no trace whatever of disease, and that ulceration seldom commenced in the patches till from the twelfth to the fifteenth day.[4] If then the symptoms of typhus can be present without this change in the intestinal canal, it is clear they do not always depend upon that as a cause; but it would seem that the intestines are likely to be affected in the course of the disease, as is shown by observation both here and in Germany. Much more might be said upon this subject, but considering that the fact of the cause of typhus being due to changes in the glands is untenable, and believing that it is but one of many effects of the vascular disturbance, it need only be observed that when this condition of the intestines has been induced, much sympathetic irritation of the brain undoubtedly results. The lymphatic glands of the mesentery are often enlarged, red, and sometimes contain pus; their affection in many cases has a distinct reference to the condition of the intestine.[5] This also M. Louis seems to

[1] Louis, cap. 5.
[2] Louis, p. 113; and Examen de l'Examen de M. Broussais.
[3] Broussais, Examen, p. 439.
[4] Chomel, pp. 56, 76, 78, 115, 223.
[5] Chomel, 203, 205.

consider as one of the peculiarities of typhus, but Muller regards it as merely sympathetic; his account bears upon my subject as showing how readily minute vessels may take on diseased action and secrete pus from their lining membrane, he tells us that "the inflammation and suppuration of the mesenteric glands, consequent on ulceration of the intestines in typhus, afford us distinct proof that in this case at least, the pus is formed in the absorbent vessels and glands themselves."[1]

The glandular structure of the larger viscera is extensively diseased in some cases, and larger patches of ulceration will occasionally be found there than even in the small intestines.[2] When the glands of Brunner[3] are affected, the whitish matter which is secreted elevates them considerably, so that they assume the shape of a cone, from which cause arises the mistaken notion, that pustules are formed in this structure. We are informed by M. Chomel, that it is a rare circumstance for these glands to become ulcerated, and still less common to find them affected singly; he, however, quotes a case to exemplify this anomaly.[4] Many other of the lymphatic glands, besides those of the intestines, are liable to inflammation and suppuration, such for instance as the axillary and inguinal; but whether the cause be the same in all, must for the present remain only a conjecture. Of glandular parts, the parotid and submaxillary are most constantly implicated; sometimes when the cases are tending to recovery, at other times early in the disease, when no other than a fatal result can be anticipated. Swellings beneath the ear do not always prove that the parotid gland is affected, as M. Louis has noticed that sometimes suppuration takes place in the cellular tissue around the gland, which at other times, however, is itself affected.[5]

The whole secreting system seems more or less to be deranged. M. Louis has even found that the liver, or at any rate its secretions, are much disordered,[6] nor does the kidney or even the pancreas escape.

As regards the condition of the glands in some of the exanthemata, we connot help being struck with the resemblance of scarlet fever to typhus in this respect. The parotids were often affected in the scarlet fever which prevailed at Copenhagen in 1777.[7] This was also the case in an epidemic of the same character which ravaged New England, in which suppurating tumours are described to have followed the attack.[8] In the scarlatina prevalent in

[1] Müller, p. 754. [2] Chomel, p. 60.

[3] Erroneous notions exist respecting the glands of the intestines; it may therefore be as well to observe, that the glands of Brunner do not reach lower down the intestine than the end of the duodenum or commencement of the jejunum. The glandulæ solitariæ most numerous in the cœcum and appendix are single sacculi, similar to those which when aggregated form the patches of Peyer.—Müller, p. 496.

[4] Chomel, p. 202, 217, 251. [5] Louis, p. 323. [6] Ibid. p. 187, 313.

[7] Willan, p. 337. [8] Ibid. p. 313.

this country, in 1802, swelling of the parotid glands occurred, which sometimes suppurated.[1] Buboes, with swelling of the parotid, were met with in the scarlet fever described by Morton, and also in that which occurred at Upsal, in 1741.[2]

It may not be considered inappropriate to make a few brief allusions to certain morbid changes in the secretions. The sordes coating the tongue, lips, and teeth, is a vitiated mucus, and not, as has been conjectured, blood discoloured by an acid: if it were blood, we should expect hemorrhage from the mouth, which, however, does not occur. M. Louis observes that the state of the tongue is dependent upon the condition of the nervous system, and is quite unconnected with disorder of the stomach or bowels.[3] These ideas are quite in accordance with our experience, and in all probability, the absence of moisture in the mouth arises from stoppage of secretion in its passage through the salivary duct. An enormous extrication of gas sometimes takes place in the large intestine; which, however, does not seem dependent upon any cognisable alteration, certainly not upon ulceration in the intestine.[4]

MUCOUS MEMBRANES.

The mucous membranes in typhus present either separately or conjointly various morbid alterations, the chief of which are staining, softening, inflammation, and ulceration. The whole of the membranes of this class are obnoxious to these changes, but not in an equal degree, some being much more sensible than others to the impression which results from the typhoid poison. Under the head of mucous membranes, those parts will be reviewed, to which Meckel has extended this term, so that not only will the tunics be included which line the hollow viscera and communicate externally with the air, as also other tissues which from secreting mucus are entitled to be so considered, but certain internal membranes and the cutaneous tissue itself.

In speaking of changes in the respiratory organs, M. Louis has observed that the epiglottis, the glottis, the larynx, and trachea are sometimes affected, though less frequently than other portions of the membrane of this order; and here let me delay for a moment to state that my reason for quoting so often from foreign authorities is, because examinations post mortem are invariably made abroad, and the changes arising from morbid processes are more generally known, and have been classed with uncommon diligence by the author above referred to. Several cases have occurred to me in which the larynx and upper portion of the trachea have been intensely

[1] Willan, p. 313. [2] Ibid. p. 272.
[3] Louis, Recherches, p. 64. Exam. de l'Exam. de M. Broussais, p. 144.
[4] Louis, p. 226.

inflamed, and erysipelas extending to these parts has more than once proved rapidly fatal. Few morbid changes in typhus are more constant than those in the lining membrane of the lungs; it would be rare indeed to find a case of this disorder in which disturbance of the respiratory functions did not form a prominent feature in life, or where organic changes were not met with after death. Hildenbrand considers the affection of this part as essential to the disease, and Dr. Tweedie states that bronchitis is invariably present.[1] In the epidemic fever described by Dr. Bateman, the chest was frequently affected, all which points of correspondence join with others in proving the identity of the disorder, though prevailing at different periods, and in countries far removed from each other. The bronchi are in general red, or of a violet colour, darkening towards their termination, and are often found to contain a bloody secretion.[2] Without any organic changes they are sometimes discoloured by transudation, and it should be recollected in examinations of the body that all the mucous membranes are liable to be thus reddened, for we are likely to fall into error if reliance be solely placed upon alteration of colour as an indication of structural disease.

The mucous membrane of the alimentary canal is very often disordered; not only does ulceration over the patches of glands destroy the tissue in this part, but in others also: thus the pharynx and œsophagus are occasionally ulcerated, a change which I have myself never met with, but which has been seen by M. Louis, who observes also that the stomach is in most cases more or less seriously implicated, being either softened, attenuated, changed in colour, or texture: still he declares that it was often natural, oftener indeed than in death from other causes.[3]

Now it is important when we approach the consideration which refers the main-spring of typhus and all other diseases to the mucous membrane of the stomach and intestines, that we should be acquainted with the appearances usually presented by them. Being impressed with the fact, that the post mortem appearances of the stomach were but little understood, Dr. Yellowly examined this viscus after death in twenty cases of persons affected with various ailments taken indiscriminately; in one only of the whole twenty was it free from morbid alteration, the changes which he found being chiefly referable to vascularity. The villous coat presented appearances of congestion, and was either florid or dark coloured, the blood occasioning this fulness was contained in distinct vessels, or formed extravasations of various sizes, character, and degree; this happened under all circumstances, and when from the character of the previous indisposition the most healthy aspect of the stomach might fairly be anticipated: the difficulty of distinguishing between such vascularity and inflammation has been well shown by Dr. J. Davy.[4]

Valuable as are the remarks of M. Broussais on the result of

[1] Cyclopæd. Pract. Med. vol. i.
[2] Chomel, 291.
[3] Louis, pp. 159, 171, 543.
[4] Med. Chir. Trans. vol. x. p. 92.

inflammation of various parts of the alimentary tube and the symptoms peculiar to each—important as no doubt it is to watch changes in local organs, and to relieve them when oppressed, and calculated as this theory undoubtedly is, to call the attention of practitioners to the condition of the mucous membrane of the stomach and intestines, yet I feel it difficult to subscribe to the notion, that all essential diseases owe their origin to change in this structure.

How indeed can M. Broussais's theory be admitted, that typhus is produced by gastro-enteritis, when we find that many cases terminate either by death or recovery, without any symptoms referable to the bowels in the one case, or any morbid alterations in the other? How can we explain by this idea the leading symptoms of the disorder? How, for instance, can we refer the headache, which at an early stage is so constant and distressing, to the condition of membranes of the intestinal canal, when we find that it is most severe where the disorder of the bowels is slightest, and that it declines in the course of the fever when diarrhœa comes on,[1] and ulceration of the intestines is established and progressive?[2] How can we explain the increase of the constitutional symptoms, and the fatal termination which occurs in typhus or other exanthemata, in those cases in which ulceration of the mucous membranes is found in a state approaching to a cure?[3] Is the fever which results as the consequence of ordinary inflammation of the intestines infectious? How can it happen that gastro-enteritis should produce the different essential fevers? The very term essential, implies a malady which does not depend upon another, and is used to designate a primary disease in contradistinction to those which are symptomatic;[4] to say therefore that essential diseases arise from gastro-enteritis is a contradiction. The infectious nature of typhus, its definite course, the rash which characterises it, prove it to be something specific; the earlier symptoms and their subsequent course are entirely at variance with the progress of simple gastro-enteritic disorders. If we admit that this theory has had its use, let us not forget at the same time that this or any other dogma which confines our attention to any single part, or to any one tissue, as the cause of the phenomena in the infectious eruptive fevers, may be productive of evil. Sir Charles Bell has truly remarked that "the study of tissues instead of the properties of the system, is likely to draw the pathologist from the main point of inquiry in the investigation of disease;" and he has justly censured those who point out local changes as the cause of all general disorders. Dr. Bateman tells us that of 678 cases treated by him in the House of Recovery, 51 only had vomiting, and in but a small portion of these cases was it accompanied by pain and tenderness of the epigastrium on pressure.[5]

These facts must induce the belief that inflammation of the

[1] Louis, 132. [2] Chomel, 224. [3] Ibid. 527.
[4] Dictionnaire de Med. et Chir. Art. "Essentiel."
[5] Bateman, p. 47.

stomach but rarely occurs; gastritis is a very unusual disease, so unusual indeed, that notwithstanding his extensive practice, Dr. Abercrombie never met with a case of pure idiopathic inflammation of the stomach, as he himself states in his pathological researches on the diseases of that organ. Since then the theories of MM. Broussais and Louis are incapable of explaining in a satisfactory manner the numerous symptoms of typhus, and since pathological investigations fail in proving the changes in the stomach or intestines to be primary or even constant, we should not assign to these alterations greater importance than to similar affections in other parts. I have only to add that ulceration has been found in the parietes of the stomach, and sometimes though rarely in the duodenum.

The signs by which affections of the different portions of the chylopoietic viscera are pointed out, vary with the part attacked. Pain in the abdomen, sickness, and diarrhœa, are the chief indications; they, however, may all be present without any appreciable change in the membranes, and ulceration may proceed even to a considerable extent, yet no one of these symptoms warn us of its existence. Diarrhœa would appear especially to point out irritation with increased secretion from the lower portion of the intestine; pain seems to be produced by inflammation of the upper part of the alimentary canal, and sickness by organic changes in the stomach.

Of the genito-urinary portion of this membrane it may be remarked, that there is in some cases unnatural redness, and that symptoms of inflammation of the bladder occasionally show themselves; one case has already been quoted in which pus was found in the fallopian tubes.

Including in this division such membranes as Meckel has classed under the term mucous or cellular, I have to notice the conjunctiva of the eye and pia mater.[1] The suffusion of the conjunctiva is a very constant occurrence; and is especially interesting if we may be allowed to infer that it indicates the state of circulation within the cranium. I cannot avoid entertaining the notion that we have here an external index of the condition of the other branches of the internal carotid. This suffusion appears early, simultaneously with the cerebral disturbance, or soon after. Should the above conjecture be true, the pia mater must be in a highly vascular condition, and such we are warranted in believing to be the fact, from the symptoms and post mortem appearances in this part. Affection in the head is indeed spoken of as almost invariably in typhus. During life it may be difficult to distinguish inflammation of the substance from that of the membranes of the brain, and in practice it may be unimportant; but after death we can entertain no doubt whatever as to the parts affected. The remark made by me in the year 1831 on this subject, as exemplified in the epidemic of that year, was that "The morbid appearances discovered upon dissection were almost

[1] Meckel, vol. iii. p. 210.

entirely confined to the lungs and brain. The various tissues of the lungs were affected in some, but in all an affection of the membranes of the brain was found, either turgescence of vessels, increased vascularity, effusion of serum or pus, or the deposition of lymph varying from the thickness of a line, to a quantity only sufficient to render the arachnoid opaque.

"The ventricles were the seat of the effusion of serum, pus and lymph were deposited at the base, on the hemispheres, and between the convolutions of the brain."[1]

All the authors who have written upon typhus take notice of the cerebral disturbance; the name given to the fever attests that this has always been observed to be a prominent feature in the disease. While the conjunctiva of the eye indicates increased vascularity alone, the membranes of the brain furnish us with incontestable proof, that in very many cases the vascularity there excited has gone on to positive inflammation. The proportion in which the procession of inflammatory action takes place, has been made by some a matter of calculation. Out of fifty-four cases alluded to in the Cyclopædia of Practical Medicine, thirty-seven exhibited traces of inflammation of the brain.[2] M. Louis, who considers this affection as merely secondary, admits that the pia mater was injected in half his cases, and in many to a remarkable degree; he adds that the arachnoid had poured out a turbid and flocculent secretion in one fourth, and that in one fifth a false membrane had been formed on the inner portion of the dura mater.[3] The number of cases too in which fluid was effused into the ventricles will contribute to maintain the position, that the membranes of the brain are affected, and that they are so in a positive definite manner. There is in all, I believe, increased vascularity of the pia mater; this condition may be, and probably is, all that occurs in the slighter cases, and subsides without further mischief; in the more serious ones, however, where the patients have lived intemperately, or are of an irritable habit, the vascularity incident to the disease lights up into intense inflammation. The symptoms, I think, justify this view, those even who take little cognisance of the brain as obnoxious to the operation of the poison which engenders this disease, allow that the headache is an almost invariable symptom; all the other signs of inflammation in the meninges are also present: if then we find the signs of a certain organic change, and also the known consequences, we should be blind to all rational means of accounting for the symptoms, did we not connect them. We are fully borne out in concluding that when similar effects arise the cause is in both cases the same. All the characteristics of meningitis are met with in typhus; there is one impression, however, which I do not find mentioned in accounts of inflammation of the brain; several patients have told me that

[1] Some account of the fever prevalent in 1831, by the Author, p. 9.
[2] Cyclopæd. Pract. Med. vol. i. p. 178.
[3] Louis, p. 374.

when labouring under this fever they have felt a strange sensation of doubt with respect to their own identity, imagining that their individuality was shared by others, and that they combined many beings in their single selves. With these observations I shall dismiss the consideration of cerebral tunics, which appear to be more frequently affected than the substance.[1]

The effusion of serum tinged with blood into the theca of the spine indicates also excitement in the membranes of the spinal chord, and the great pain at the back of the neck and limbs must induce the belief that this part is frequently the seat of irritation. The spine is itself often free from any morbid change, it was so at least in six cases examined by M. Chomel.[2]

There are but few other topics to be mentioned under the head of mucous tissue; one, however, is the skin,[3] the alterations in which have already been noticed at considerable length, and here, as in other eruptive fevers, much vascular disturbance is to be perceived; in this structure is seated that phenomenon of increased vascularity termed the rash; this is the seat of erysipelas; this is the part chiefly exposed to sloughing and mortification. These points, however, have already received sufficient attention. I shall therefore pass on to the next division.

SEROUS MEMBRANES.

Under the head of serous membranes I shall allude to the arachnoid, the pleura, and the peritoneum.

The arachnoid might have been considered at the same time with the pia mater, as it is difficult to distinguish in some cases whether effusion poured out between this membrane and the pia mater proceeds from one or the other,—in general they are simultaneously affected.[4] A change in the arachnoid is proved by its opacity, and like all serous membranes, probably also by increase in its sensibility, but it seems to me very doubtful whether disturbance of the brain, which is often attributed to inflammation of the arachnoid, can arise from such a cause: the pia mater I imagine to be the part affected when cerebral disturbance is produced, except when such a quantity of secretion has been poured out from the arachnoid as to influence the brain mechanically by pressure.

The pleura is an important part, and with all the other tissues of the lungs is not unfrequently the seat of inflammation. It is a practical point of great moment to be aware of this fact, and to be impressed also with the knowledge that the inflammatory process goes on in this membrane without the usual admonition of the acute pain and hurried breathing which are so characteristic of ordinary

[1] Chomel, p. 293.
[2] Chomel, p. 393.
[3] Meckel, Man. d'Anat. vol. i. p. 465.
[4] Abercrombie, p. 19.

pleurisy. Patients labouring under typhus will often remain in a state of apathy or indifference, and unconscious of all ordinary impressions, local disease therefore is wanting in outward demonstrations; thus pleurisy will occasion no pain, and there will be no cough, as the lungs will be sufficiently expanded by respiration to prevent congestion. I have known irreparable mischief produced before an idea was entertained that any disease existed in the chest, or that attention was drawn to the affected organ. The pleura does not appear to suffer from the direct action of the typhoid poison, nor indeed do any of the membranes of this class, but seems to become involved by the spreading of inflammation from the contiguous tissue, or other causes. A considerable quantity of fluid is frequently found in the pleuræ, and arises according to M. Louis from exudation, owing to congestion of the lungs: such a change is certainly comparatively rare with us; the quantity he observes varies from three to thirty ounces, and the effusion is double, taking place at the same time on both sides of the chest. It is scarcely necessary to add that in the pleurisy of typhus, lymph, serum, and pus, are the fluids effused, pus and serum being present in the greatest abundance.

Examples have been given of peritonitis, one of which appeared to have been primary, the other secondary, by which I mean that in the one case there was an obvious cause, capable of exciting inflammation, namely, pus, in the fallopian tube. Strictly speaking, however, they should perhaps be both considered secondary, the membranes of this class being comparatively rarely implicated, and only so late in the disease. Ulceration in all the other tunics of the intestines producing perforation of the peritoneum, seems a common incident in France, but is rarely met with in this country.[1] It has never happened to me to meet with effusion into sero-fibrous cavities, but both Bateman and Hildenbrand observe, that cases presenting pain and swellings, as in rheumatism, have occurred in their practice. Such an event has however occasionally presented itself to me in some of the other exanthemata.

ON MORBID CHANGES IN THE PARENCHYMA OF ORGANS.

Our next object will be to consider the alterations in the tissue of organs, but of these such only will be commented on as are most liable to change, and most important and formidable when diseased. The lungs and brain are alike exposed to take on disordered actions, and alike involve the safety of the patient; these, therefore, will form the subject of this section.

The frequent alteration of the mucous, and the occasional implication of the serous membranes of the lungs, has already been spoken

[1] Louis met with it in one eighth of his cases. Chomel calculates the occurrence as one in twenty-one times, p. 47.

of; attention is now called to the remaining portion of it, the actual structure. Already has a caution been expressed lest inflammation of the pleuræ should be overlooked, doubly on our guard must we be that pneumonia does not establish itself and irreparably damage the lungs, or irrecoverably exhaust, by the irritation which it occasions, the strength of our patients. The comparative insensibility of the parenchyma of this organ will readily satisfy us of the absolute necessity of frequently resorting to auscultation, the use of which is signally exemplified in the treatment of typhus; for it is not only essential to ascertain the fact whether the lungs are inflamed, not only necessary to make out the character of the lesion, but of vital importance also to know the exact spot which is diseased, for there is no strength to be thrown away, and as our measures must be depleting, they must be appropriately directed. In my experience the substance of the lung is affected in almost all severe cases, scarcely has one patient passed through the protracted periods without oppression of the chest, hurried breathing, and small crepitation. The lungs, when examined after death, have presented the various stages of inflammation; and not only has consolidation been discovered at the base, to which part it is confined by M. Louis, but I have seen it also in the upper lobes. A purulent secretion is met with occasionally throughout the structure, and abscess will sometimes form in the upper, and indeed in every other part. In one case[1] examined by me, inflammation in the upper lobe of the right lung went on rapidly to ulceration, and large cavities were formed in this portion of the pulmonary tissue.

The very rare occurrence of gangrene of the lungs in typhus has struck me as curious, and capable of strengthening my notion that it is not one process of inflammation alone which leads to all the varieties of termination. Inflammation in this part ends in purulent effusion, hepatisation, cavities, any other way in short but sphacelus. Yet the strength of the patient is prostrate, his fluids are diseased, and inflammation is excited, but not in the situation which leads to that complete obstruction of vessels which seems essential to mortification.

In the greater number of those who die from typhus, the substance of the brain is rosy and injected; this has been remarked by M. Louis, who says, however, that the consistence of the brain was but little altered, though out of the whole number examined by him in six cases he found it firmer, and in five softer than is natural. When we perceive great increase in the vascularity of the pia mater, and know the intimate connection of this membrane with the brain by means of its numerous minute vessels, it is difficult to imagine that irritation can arise in the one without being communicated to the other, but not only does excitement at the surface take place, but also occasionally in its substance. Sir John Pringle states, that he met with abscesses in the brain, and also in the cerebellum,[2] and

[1] The first. [2] Page 303.

we learn from Hildenbrand that the brain will occasionally suppurate. Dr. Bateman considers that the inflammation in this fever is modified, except when it attacks the brain, but I do not see any reason to make an exception to the general rule, because, although the brain is often greatly affected, and though patients who have great disturbance in the functions of this organ remain comatose for many days together, experience at times great difficulty of utterance, and suffer from effusion, as was exemplified in the case of Clarke,[1] yet they will recover more completely from such affections when originating in typhus than is the case when similar results arise from idiopathic cerebral affection.

These observations will terminate the brief sketch which I proposed to give, respecting the actual organic changes in important organs, from the poison of typhus and its consequences. If for one moment we take a retrospective view of the organic changes, we shall find numerous results produced in the course of a single disease; many parts suffer; but although the proposition may appear startling, when first laid down, that these arise from one cause, and that disorders should be considered as identical, which in one country, or during one season, produce great determination to the bowels, yet in others be comparatively deficient in such signs, I would still observe, and we may find examples in well known substances or in other diseases, that the same poison will produce quite as various effects in different individuals, and may be modified by many causes. Take arsenic for an example. Who can say with certainty at what time the effects of this poison will commence; when we know they may appear in ten minutes, or that eight hours may elapse without any visible indication. Who will venture to assert what will be the appearance in the stomach after death—when we learn by experience, that although inflammation is usually produced, yet sometimes there will be absolutely none; who will predict with certainty the remote effect on the nervous system, when we know that sometimes palsy and loss of power of the limbs ensues, sometimes convulsive movements and violent spasms. The parts too implicated by the action of this poison are various; the skin and mucous membranes, the brain, the spine, and from continued exposure even the bones and joints have been known to suffer."[2] Look at the operation of mercury: the circulating fluids, the soft parts, the bones, all are in turn affected.

See what a host of hideous forms march in the train of syphilis! How multiplied and repugnant are the aspects in which this poison shows itself in the cutaneous tissue alone! How many, and what various parts are affected in its course! What torture and disfigurement accompany its progress. Hunter in his work on this

[1] No. xliii. p. 63.

[2] "Arsenic acts on the brain, heart, and lungs—the throat, gullet, and intestines—the lining membrane of the nostrils and eyelids—the kidneys, bladder, and vagina."—Christison on Poison, p. 18.

subject; Hennen, in his Military Surgery; and Cooper, in his dictionary, show how differently this same virus may act even in its primary impression.

Numerous are the effects of malaria; but enough has been said to prove the fact that the operation of the same poison is multifarious, and sometimes on one part, sometimes on another. I am aware that peculiarity of constitution, previous habits, present state of health, climate, season, and many other things, modify the action of these agents; to all which causes it should however be remembered the poison of typhus is subject and amenable.

The classification of typhus should be based either upon obvious and palpable differences in its aspect, or upon an intimate knowledge of its real nature, the latter of which is of course most desirable: but as this is yet unsettled, little need be said upon the varieties of the disorder. Cullen divides them into the mitior and gravior: this arrangement, as it simply states the fact that the fever is sometimes benign, at others malignant, is in no degree objectionable. M. Chomel also makes two varieties, namely, typhus and typhoid malady; the typhoid malady, he says, lasts longer than typhus, the one continuing fourteen the other twenty days; and that the rash appears on the fourth day in the shorter, but not till the eighth in the longer ailment.[1] These surely are the same disease, varied only by circumstances, the reason of which will appear if my explanation of the steps of this disorder be admitted. Dr. Armstrong makes three kinds; the simple, the inflammatory, and the congestive, terms which are very questionable, as they imply that the character of the disease essentially varies in the three descriptions. He, moreover, divides the inflammatory sort into the acute and sub-acute, a refinement which seems unnecessary. Leaving this subject to be determined when we are more thoroughly acquainted with it, I pass on to the most important division, practically speaking, the

TREATMENT.

The next object of inquiry will be the mode of treatment, which ought to be adopted in typhus. The confusion found in medical works upon the subject, forcibly attests the importance of ascertaining the origin of that disorder and the different steps in its progress. To promote this object a clear arrangement in the periods of the disease will be obviously valuable, as enabling a practitioner to direct his remedies to the real condition of the patient, to arrange and to methodise his treatment: this has been done by the German professor with perhaps too great minuteness, but in this country its importance has been undervalued. Nothing indeed can be more contradictory than the plans, the adoption of which is advised by

[1] Chomel, page 337.

those who have written upon this fever. No situation can be imagined more embarrasing than that of a young practitioner, who, having neglected opportunities of clinical instruction, and relying chiefly on books for his information, is suddenly obliged to take upon himself the responsibility of a case of typhus. He is struck with indications apparently opposite; there appears a formidable array of urgent symptoms, seemingly requiring immediate relief; a serious disease is before him; life is in imminent peril; some quick change seems absolutely essential; some active means must at once be employed; yet at the same time there are symptoms which oblige him to pause, and soon satisfy him that powerful remedies are entirely out of the question, for, should he employ them, the results from such measures will appal him, and prevent their indiscriminate employment in future. There is such a mixture of action with debility, that while prompted on the one hand to the use of energetic measures, he will feel on the other that a great risk must be incurred by their application.

Perhaps, by way of experiment, the treatment of a case is by active depletion; good may result, and the plan appear justified by its effect: yet the good may be but temporary, and he may be right in thinking that his plan alone has caused the train of alarming consequences that ensues. Let him try a contrary mode, and it is likely enough that a long and anxious period of danger, and a tardy convalescence, will make him doubt much as to the propriety of leaving nature unassisted. The works on whose authority he relies, may perhaps be again consulted: he will there read that neither bleeding, nor emetics, nor purgatives, nor active means of any kind are recommended, nay, he will even find them denounced in terms sufficiently strong to deter him entirely from their employment, did he not discover, on further inquiry, how other writers maintain that they never lost a patient when they employed venesection, emetics and active cathartics, which should be resorted to boldly and invariably.

It may be said, that watching cases and observing treatment will give practical tact, but practical tact must have reason for its basis, and can only be valuable when founded on a correct notion of the object to be attained.

The importance of ascertaining the origin of a complaint is, as has before been stated, of the highest value with respect to its treatment. The blood-shot eye, the pain and increased temperature of the head, attended by delirium, offer inducements to depletion which it is very difficult to resist, and which it would be most unpardonable to overlook, if the disease had not a specific origin. But when once we are satisfied that all the above symptoms arise from the introduction of a poison into the system, we feel that much more important objects are to be attained than the mere subduing of inflammation, even although we should feel satisfied that such a condition did actually exist. We know that a cause affecting the whole system is now in operation, and that the reduction of action

in one part is doing but very little, whilst the causes giving rise to it still remain, and are capable of producing it elsewhere. A specific disease cannot be cured by depletion; over excitement can indeed be controlled, but the disease still remains in operation. As the question of bleeding is one of the most important, I shall select that to begin with, and by way of showing what confusion and contradictions exist upon this head I shall quote a few of the many opinions expressed upon it.

In treating of jail or hospital fever, Pringle states the result of his observations to be, "that bleeding had but little effect in reducing the symptoms of that disease;"[1] again he says, "that in inflammatory fevers, bleeding is very useful, but seldom gives ease in typhus."[2] M. Broussais, observes, "that the gastro-enterite-aigue-typhoide, is one of those forms of inflammation with which the lancet has the least to do."[3] Bleeding in the early stages is condemned by John Hunter; "I remember," says he, "when practitioners uniformly bled in cases of putrid fever, but signs of debility and want of success soon made them alter their practice."[4] In Hildenbrand's opinion, "venesection during the nervous period, as also during the inflammatory one, if the patient be weak, is a dangerous remedy in the majority of cases."[5] If we refer to older practitioners we find bleeding prohibited. Sauvages says that "typhus curandus est refocillantibus, cardiacis, alimentis scilicet lenibus, diluentibus, abstinendum a phlebotomiâ, &c."[6] Authorities, and some of great weight, are not wanting on the other side. Dr. Bateman's opinion, and the mode in which this was forced upon him has already been stated; he says, in addition, "blood-letting is capable of very general application, it is capable too of abridging the course of fever if employed early."[7] "It may be resorted to on the third, fourth, or fifth, or even on the sixth day."[8] He prefers venesection to the local abstraction of blood, or to the employment of leeches, or cupping, and declares his persuasion that four ounces of blood drawn from the arm produces more essential benefit than twice that quantity dribbling away after either of the other operations.[9] He forcibly urges us not to be deceived by signs of debility. "Even when the sensorial disturbance is inconsiderable, not exceeding a little occasional confusion in waking, or slight wandering in the night; yet if rather on the increase, and if the pulse continue frequent, at, or more than 120, with the slightest sharpness in its feeble stroke; if the tongue becomes parched and brownish, and cannot be steadily protruded; and if the strength be manifestly impaired, the voice feeble, and the skin rather dry, appearances which are usually considered as indications of lowness and failing powers; still," he continues, "I do not hesitate to affirm

[1] Sir John Pringle, p. 291. [2] Ibid. p. 247.
[3] Broussais, Examen. du Doctrine Nouv. Med. p. 463.
[4] John Hunter, p. 400. [5] Hildenbrand.
[6] Sauvages, Nosolog. Method. 8vo. Amstel. 1763, vol. ii.
[7] Bateman, pp. 94, 98. [8] Ibid. p. 102. [9] Ibid. p. 114.

that this condition is to be relieved by moderate evacuations, and will be infallibly aggravated and carried on into subsultus, and muttering, and picking of the bed clothes, and ultimately to death, by wine and cordial treatment."

Rasori, who gained such reputation in Italy as a "contra-stimulist," began his treatment of typhus when it prevailed epidemically in the Genoese Territory in 1799 and 1800, by the exhibition of stimulants, but he found that he had very little success in his treatment. He then took some blood by leeches; encouraged by the result, he ventured upon cupping, and was so satisfied with the efficacy of the depleting plan that he informs us how ultimately his treatment always began by taking about thirteen ounces of blood from the arm. At the same time he resorted to antimony, which he gave in very large doses. He sometimes bled a second, but never a third time, and it is said that after the introduction of this plan he seldom lost a single patient.

Dr. Armstrong recommends bleeding; to avoid early depletion, he says, is an error of the schools; but the reason which he gives for its employment in many cases, (viz. venous congestion, indicated by feebleness of the pulse,) and the extent to which he says depletion by phlebotomy should be carried (namely, to syncope,) are both open to objection, and we may conclude, that he had seen occasion to doubt the propriety of its employment at all in some instances, for he admits, that, "the system sooner sinks after bleeding in typhus than in any other fever," and says that it must not be repeated if the pulse should be weaker after the operation than before.[1]

Dr. Armstrong may have carried this practice too far, but he has the merit of daring to act contrary to the common opinion, and no doubt there was great deference paid to established usage in his time, and that of Dr. Bateman; because the grounds which would justify loss of blood, were less clear and precise than at present, and the pathology of this fever was involved in still greater obscurity. The errors of the schools above alluded to, were certain notions which had sprung from various theories of disease: the chemical school maintained the efficacy of antiseptics, the followers of Brown considered all the phenomena to be due to asthenia or weakness: the Stahlians gave us the "expectante" plan, and the humoral pathologists tried to force out the disease by perspiration or other evacuations, and employed heat, alexipharmics, stimulants, &c. The result of all the above testimonies tends to show that bleeding is decidedly useful in certain cases, but as positively injurious in others, and the great difficulty with the practitioner must consist in a nice discrimination. In some diseases if you doubt, you should bleed, but in typhus the contrary obtains. Caution, however, is always to be exercised, and the quantity of blood to be drawn must be regulated by the effect, the state of the patient, and the period of

[1] Armstrong, on Typhus, p. 86.

the disease. That this remedy is very rarely to be employed in a late stage there can be no doubt, but that it is eminently useful in the earlier ones I am quite convinced; and if immediate improvement results, and the disease assumes a mild form, we are not to imagine that venesection was wrong, though the blood be free from the inflammatory buff. Many earlier severe symptoms may thus be mitigated and controlled, many of the after consequences prevented: this is the result to which experience appears to have led M. Chomel, though from his remarks upon this mode of treatment he considers the simplest cases as those most benefitted by venesection.[1] M. Louis's tables also show that bleeding in the earlier stages had a beneficial influence upon the continuance and termination of the disease. The great object to be achieved is not the removal of one or other local symptom, least of all oppression in the head; bleeding seldom does that, but conduces to mitigate them all. In truth, various phenomena are exhibited by the disease which bleeding is unable to stop, but can mitigate and restrain, at the same time we must not be unmindful that the irritation produced in the simpler forms is liable to pass on to inflammation, and may render bleeding or other depletion advisable. That the head is positively affected, appears by the attendant symptoms—headache, giddiness, tinnitus aurium, stupor, or a tendency to sleep, change of manner, affection of speech, being at one time hasty, at another slow; mental wandering, incoherent talking, confusion, and forgetfulness, with convulsive agitation of the muscles of the face, hands or whole body, and a morbidly acute sensation in the limbs, which are sometimes rigid, at other times convulsed. To this long list may yet be added retention of urine, and unconsciousness of the evacuation of the fæces. The whole of the above we are told by Dr. Abercrombie,[2] are symptomatic or secondary in the course of other eruptive diseases besides typhus, such as measles and scarlet fever.

Should, however, inflammation be excited in the membranes of the brain, it will not require such active treatment as is necessary in simple meningitis. Should it be seated in the lungs, the pain will not be so severe as in idiopathic pneumonia; nor will the dispnœa be so urgent, the cough so troublesome, or the same loss of blood requisite. If on percussion, dullness of the chest indicate that hepatisation to a certain extent has taken place, moderate depletion will arrest its further progress, and most efficiently conduce to restoration of health in the lung.

In looking over my cases in different years, I find that venesection was more necessary in 1831 than in 1837, and in the present year more so than in the last; but in by far the larger number of cases which I have had to treat, loss of blood by some means or other has been imperatively called for, and from conviction of its utility I strongly advise that blood be drawn from the arm if the

[1] Chomel, p. 166.

[2] Abercrombie on the Brain, p. 14.

patient's strength authorise the measure, and the pulse be full and sharp. Bleeding during the earlier stages of the disease, is to moderate action and to control power, but is resorted to later to relieve local complication: hence general depletion must chiefly be confined to the first periods, though it may be called for and even advisable in all. Any fixed rule or invariable course, will certainly betray us into error, for it is as fatal to perform phlebotomy injudiciously, as it will be to neglect it on proper occasions, and we need not be deterred by any fear of consequent debility from adopting this measure under the circumstances above described.

The employment of this, as well as all other active remedies, must depend upon the judgment of the practitioner, but should my idea be correct, that typhus is a specific, infectious, and eruptive disease, the same rule would obtain in this as in other disorders of the same class, in which active interference is not very often necessary. There can be no reason for bleeding in the slighter or simpler cases, they will successfully pass through their several stages and not require any energetic measures. It is only the expectation of a severe attack from the threatening of earlier symptoms, the complication of vital organs, or the excess of general excitement, that oblige us to resort to the lancet. When this measure is determined upon, it is not necessary, as in acute inflammation, to allow the blood to flow till fainting ensues; it will be quite enough to change the character of the pulse, which is readily affected in typhus. This appears to me a sufficient answer to those who recommend arteriotomy instead of venesection. General effect is the great object in either mode of abstracting blood, and as the system very quickly acknowledges the impression when a vein is opened, we need not adopt the more difficult and less controllable plan of resorting to an artery.

Dr. Bateman, in speaking disparagingly of cupping and leeches, has greatly wronged these different and very valuable modes of relieving local congestion or inflammation. Many owe their lives to these methods of depletion, which are signally appropriate in such a disorder as typhus, in which we daily see examples of general debility combined with local action; the head, the lungs, the abdomen, require their employment, and at a time when bleeding from the arm would only aggravate the general depression without relieving the topical mischief.

M. Broussais has noticed the state of prostration which ensues upon the injudicious repetition of venesection, and is of opinion that local bleeding, and that by leeches is the best; these he advises us to place as near as possible to the seat of the disease, which with him would be the stomach or its neighbourhood, and no sceptic can fail of being satisfied of the advantage to be derived from their employment, both as a means of relieving inflammation of the membranes when established, and of controlling the head symptoms when sympathetically produced.

In leeches and cupping then we have the most important auxili-

aries, and rare indeed is it, that any severe case goes through its course, without requiring their employment more than once. Of the profuse hemorrhage from leech bites enough has already been said, nothing more need therefore be added, except that benefit from their employment far surpasses any objection to their use on this score. Of the comparative value of bleeding by leeches or cupping, it may be remarked, that each seems to have its appropriate destination. Cupping is chiefly employed when the head or chest is the seat of mischief, and when the object is to procure a decided effect and immediate relief: leeches are usually applied when the mucous membrane of the chest or the abdomen is implicated, when the object is to take a very small quantity of blood, when the weight of the cupping glass would be objectionable or the patient apprehensive of this latter mode of depletion.

I shall arrange the other methods of treatment under the heads of emetics, purgatives, mercury, antimony, salines, cold to the surface of the body, sedatives, stimulants, and tonics.

EMETICS.

While great doubt exists in the minds of some practitioners about the last mentioned remedy, and very opposite opinions are entertained as to its utility, all seem to agree in the benefit to be derived from emetics, which are recommended in typhus with three objects, to empty the stomach, to change the action of the whole system, and lastly, to stimulate.

M. Chomel speaks in their favour, but he thinks, that without there be an overloaded stomach, a bitterness in the mouth, a yellow tongue, and nausea, little good can be expected from them; under other circumstances he imagines their use to be the remains of an old practice, founded simply on prejudice.[1]

Hildenbrand employed them as stimulants;[2] the action of an emetic certainly does rouse the whole system, and after its exhibition and operation, a faltering pulse will at once become steady, and beat for a time with renewed power: but an emetic cannot give strength, and in real debility the temporary excitement produced will be followed by corresponding depression. When, therefore, there is great weakness this remedy should never be employed with a view to stimulate.

All authors admit the utility of emetics, but vary in their explanations as to the mode in which the benefit is brought about. The object of vomiting in typhus is to produce a powerful nervous impression, and by occasioning a sort of shock to the system to excite a new action in the frame, and undoubtedly great benefit follows its employment. It is by no means necessary in order to secure

[1] Chomel, p. 472. [2] Hildenbrand, p. 204.

this result, or to justify us in their use, that there should be a full stomach, foul tongue, or nausea; quite as much relief is experienced in the absence of these symptoms as when they are present. The question then is not the utility of the remedy, but the appropriate time for its employment, and the kind which ought to be selected.

Hildenbrand decries the use of emetics during the period of invasion, and expressly cautions us not to resort to them whilst the shivering lasts;[1] but this seems the period of all others when they are most efficacious and advisable, being then capable of at once extinguishing the disorder. When general uneasiness and chills are felt, with the other threatenings of an approaching attack, I have found that the exhibition of an emetic has put a stop to them all. The headache is very distressing, and patients are fearful lest the retching may increase it, but such fears are entirely groundless. Emetics, then, I consider, to be a remedy capable of early employment; they may be given at any period, till the full developement of the disorder, and do not require any previous measures. When, however, the symptoms of fever are established, and heat and reaction have commenced, still they are to be employed; but we shall now have to entertain the question of bleeding; and in cases where this is advisable, venesection should precede emetics, which may afterwards be administered, generally with immediate advantage at any time within the first three days; after this their benefit is less obvious, and seems to diminish in proportion as they are delayed. Of their efficacy in rousing the system when the strength fails,[2] my own experience does not enable me to speak, having then never ventured upon their use. With us the object in giving an emetic, is to cause a general impression on the system, and to effect this purpose its operation should be certain and speedy. The combination usually employed by me, is ipecacuanha with antimony, but should the patient be weak, and feel such nausea as to induce the belief that emesis will speedily be induced, ipecacuanha may be given alone, its effect being aided by diluent drinks, such as weak chamomile tea. The result of this method of treatment is often to relieve the headache, induce sleep, provoke perspiration, stop at once all disordered action, or mitigate the formidable indications. Few remedies, in truth, exert such beneficial influence over the disease as emetics, and with the precaution mentioned above, they are almost universally applicable, and open to no objection whatever.

[1] Hildenbrand, p. 186. [2] Ibid. p. 204.

PURGATIVES.

Practitioners in this country will differ entirely from Professor Hildenbrand, who says of purgatives, that they cannot be recommended as an ordinary remedy in typhus; and adds, that their operation is sometimes injurious. This however it is difficult to understand, as with us they are proved by experience to be most decidedly beneficial. The object and result of employing this class of medicines is, in the first place, to remove from the bowels disordered and pent up secretions, or any undigested food which can serve as a means of irritating the mucous membrane; in the second place, to obviate any tendency to constipation; and, thirdly, as a means of acting generally upon the system as an antiphlogistic remedy, or method of reducing undue strength or excitement. Various means and different medicines are appropriate as we are called upon to excite the action of the bowels at advanced periods of the disease; reference must then be had to the strength of the patient, whether diarrhœa has previously been excited, whether ulceration has taken place in the intestines, &c. &c. At the commencement of the disorder, however, after the action of the emetic, it is imperative freely to evacuate the bowels, and such a purgative should be chosen as will answer the first and third of the above mentioned objects; namely, to clear out the intestinal canal in a degree calculated also to reduce action, for which purpose a dose of three grains of calomel should be given either in combination with rhubarb, or jalap, which Dr. Rush especially recommends, or by itself, followed up however after a few hours by an ordinary opening draught, such as senna, with manna, or salts.

When it is desirable to keep up action from aperients as long as the disease lasts, salines will be found most appropriate, from their acting at the same time beneficially on the circulating fluids; in which case the artificial seidlitz powder,[1] sulphate of magnesia, or other purgative salts should be given, in small and repeated doses during the whole course of the fever. The combination of salines and purgatives, is in some cases of great use; and the mixture of the liquor ammoniæ acetatis with sulphate of magnesia, although unpharmaceutical, is certainly very efficacious.

In the course of typhus, slight constipation sometimes occurs, when a small dose of sulphate of magnesia out of infusion of roses, or with manna out of distilled or cinnamon water, will answer the purpose required. Should the bowels after diarrhœa become confined, with symptoms of irritation, castor oil must be our recourse, or glysters of simple warm water be substituted for more active medicines.

Apprehensions are entertained abroad of irritating the mucous membranes by the use of purgatives, and constitute one ground of

[1] The potassio-tartrate of soda, with carbonate of soda and tartaric acid.

objection to their employment. In the disorder which we see here, and to which we apply the name typhus, no such result ensues. Nor should we be deterred from employing remedies of this class in the earlier periods, even did we know the fact that irritation of the bowels exists, as diarrhœa with pain in the abdomen frequently cease on the efficient operation of aperients. Many cases of irritation which I saw on my visits to the foreign hospitals, would, (if it were right to form any opinion on a few visits) have been essentially relieved by a good dose of castor oil and laudanum. Of the importance of keeping the bowels open in all diseases, and of the value of purgatives generally, much need not be said, and nothing can be added to the encomiums of Dr. Hamilton, and to our conviction from daily experience; but their especial efficacy in cases where the head is affected, has been stated by Abercrombie, who remarks[1] that he had seen more real or palpable benefit arise from remedies of this description than from any others. Of their value, too, Golis, in his work on Acute Hydrocephalus, speaks in the highest but not exaggerated terms.[2] Venesection, emetics, and purgatives, may then be considered the means by which we can act upon the system generally, and their constitutional effect is beneficial in proportion as they are quickly and properly employed.

The next class of remedies will rather be addressed to the disordered actions themselves, than given with a view of influencing the guiding powers of the system. The class to which I allude consists of mercury, salines, and antimony.

MERCURY.

Mercury is resorted to in typhus as a purgative, as an alterative, or else with the view of producing ptyalism, its constitutional effect; and it is also employed when there is ulceration in the bowels, in order to promote cicatrisation. This remedy as a purgative has been already considered. Of its utility as an alterative, or as a means of gently exciting the secretions, there can be little doubt, especially when the tongue is dry and the skin hot. Provided that no irritation exists in the bowels to contra-indicate its exhibition, small doses of calomel or hydrargyrus cum cretâ may be advantageously administered for several evenings together, or at intervals of a day or two.

Extended experience has made no alteration in my opinion of mercury given so as to affect the mouth. In 1831 it was unable to check the fever, although given until it produced salivation; but still in that year when the cases presented urgent inflammatory symptoms, its use was continued, and it appeared decidedly bene-

[1] Abercrombie, p. 54. [2] Golis, p. 106.

ficial, judging at least by the result; but to such cases its use in larger quantities should be confined.

M. Chomel has noticed the utility of giving mercury in repeated doses so as to produce ptyalism,[1] but he does not specify with precision the appropriate cases for its employment. There appear to me three conditions, during the continuance of which the specific effect of this remedy is clearly advantageous; one of these is met with early, the other two later in the disease. The first of these is when active inflammation of the brain has been established. The other two are when during the course of typhus, inflammation has been excited in the lungs, which has gone on to hepatisation, or when ulceration has taken place in the bowels. An important caution respecting the use of mercury when the head is affected suggested itself from a case in which symptoms of active cerebral excitement went on quickly to absolute coma. The employment of mercury was decided upon, and from the imminence of the danger it was freely administered, so freely indeed that sloughing of the jaw eventually took place, and proved in this instance a more fatal disease than typhus, as death ensued from the irritation occasioned by it some months after all typhoid symptoms had disappeared. By keeping the gums slightly sore for many weeks, as related in Case XLIX, page 66, all the healthy sounds in the chest returned, and the solidification of the lung disappeared, which, under this treatment, became free, although it had long been impervious and dull.

There is no remedy which can compete with the hydrargyrus cum cretâ when ulceration has taken place in the bowels. On the local influence of mild forms of mercury in promoting cicatrisation, it is not necessary to dilate, the good effect of this remedy in inflammation of mucous membranes is well known, and when combined with Dover's powder, as employed in St. Bartholomew's Hospital,[2] constitutes an excellent formula; given at intervals of four, six, or eight hours, it allays abdominal irritation, checks diarrhœa, and calms general constitutional disturbance.

It may be further noticed, that when calomel causes irritation, the black oxide may be beneficially substituted. A very similar effect seems to result from the employment of mercury in typhus as in other exanthemata, and the same regulations and restrictions in its use may equally apply to both.

SALINES.

Observation of the fact that certain bodies of this class diminish heat of the skin, probably led to the employment of salines in fever,

[1] Chomel, p. 187.

[2] The pilula hydrargyri cum cretâ composita consists of equal parts of hydrargyrus cum cretâ and Dover's powder, made into a pill with conserve of roses, or treacle.

and experience has confirmed their utility. The older physicians, Boerhaave, Hoffman and others recommend their use, and noticed their effects upon the system, as also their palpable influence upon the blood, when exhibited internally or mixed with it out of the body; but it is still reserved for modern chemists to show the exact changes on which their utility in fever depends. That the blood is disordered in malignant fevers, and that certain saline substances have the power of altering some of its morbid conditions will now be generally admitted; we may, therefore, rationally give salines in order to produce that result, but other changes take place in typhus; local inflammation is often established, capable by itself of producing great constitutional derangement, of giving rise to new sympathies, and materially complicating the disorder. In treating fever, we are not simply contending with a poison like opium or prussic acid, the effects of which are owing, as Müller states, to the action of the blood, thus contaminated, on the central organ of the nervous system,[1] but we have to combat numerous morbid conditions, one only of which is a diseased condition of the blood. That salines are valuable in the treatment of various disorders, has lately been much insisted on by Dr. Stevens. In support of whose advocacy of the humoral pathology, it may be said, that the ideas of Cullen, attributing all disease to changes in the tissues themselves, that is, in the solids, had too completely superseded the ancient notions of humoralism. The ideas of Bichat and Andral, that both solids and fluids suffer in fever, appear more consistent with reason than an exclusive reference of all the phenomena in this class of disorder to either system. We cannot doubt but that disease may commence with either; but, begin where it may, both must participate. "La physiologie nous conduit donc à admettre qu'à la suite de toute alteration des solides il doit y avoir alteration du sang, de même qu'à la suite de tout modification du sang il doit y avoir modification des solides."[2] Such is M. Andral's conclusion on this subject, and one which seems palpable enough, and hardly capable of receiving a contradiction, did we not see the advocates of solidism or fluidism blind to all other doctrines except their own favourite theory.

Dr. Stevens has shown the great importance of various saline substances as constituents of the blood; and has forcibly called public attention to the fact of their agency in rendering the blood florid, and duly stimulating the heart and other organs; such are no doubt some of their essential properties, and will furnish appropriate reasons for their employment. Some medical classification, however, of these substances should be made. Salts are the combination of acids with salifiable bases; those recommended by Huxham, are carbonate of potassa or sesquicarbonate of ammonia with lemon juice and nitrate of potassa. Glauber's salt, the sulphate of potassa, was generally employed by Hildenbrand. The salines in common use at St. Bartholomew's hospital, are tartrate of soda given during

[1] Müller, p. 629. [2] Andral, tom. i. p. 528.

effervescence, and the liquor ammoniæ acetatis of the pharmacopœia diluted with twice its quantity of water; this last salt in solution, commonly known as spirit of mindererus, was raised into celebrity by Boerhaave, but derived its name from Raymond Minderer, who first recommended it in 1621.[1] Although some practitioners have doubted its utility, and maintained that large doses may be given without producing any obvious effects, yet it cannot be imagined that its use can be so very general without benefit authorising its employment. Dr. Stephens especially recommends the muriate and carbonate of soda, and the chlorate of potassa.[2]

In the above list of salts, some contain a mineral, others a vegetable acid; the first of these resist the action of the stomach, enter the blood, and, like the nitrate of potassa, are rejected unchanged; the latter, however, the salts composed of a vegetable acid, as the citrate of potassa for example, easily decompose in transitu; in their classification therefore some arrangement is desirable: as when our object is to give a salt with a view to its stimulant effect, we choose one, as the nitrate or sulphate of potassa, which does not undergo decomposition; but if it is our wish chemically to affect the circulating fluids, we have a choice among the alkaline carbonates or the compounds of them, with a vegetable acid, by which means the alkaline base is eliminated, and the excess thrown out by the kidneys.[3] The effect of salts mixed with the blood, is to render that fluid more stimulating to the heart; but by preventing the tendency to coagulation, their effect must be of a lowering tendency. Much is yet, however, to be ascertained upon this point, before we can consider that we have discovered the full and entire grounds upon which their administration should depend, and our choice in their selection be guided. An interesting and instructive sketch of the history of salines as remedies, and some valuable remarks on the subject, by Dr. G. Burrows, will be found in the 14th volume of the Medical Gazette.

ANTIMONY.

It was in typhus fever that such enormous doses of potassio-tartrate of antimony were given by Rasori: he used it, as we are informed, in his treatise on the petechial fever, with equal advantage and freedom. Beginning with it immediately in considerable doses, and persevering until benefit appeared, he not unfrequently administered from six to eight grains in the course of the four-and-twenty hours. In order to prevent its rejection by vomiting, he consulted the patient's taste in the selection of a vehicle, interdicting

[1] Merat et De Lens, Dic. Univ. de Mat. Med. tom. i. p. 242.
[2] Stephens, p. 300.
[3] Paris Pharmacologia, 1833, p. 133.

only such substances as would in the least degree excite the circulation. He informs us, that the effect of this medicine was to occasion amendment, without producing any sensible evacuation. It was usually exhibited by the mouth, but once as a glyster,[1] in the case of a patient who was insensible. He justifies the plan by his list of patients, and declares that he did not lose above one in a hundred. It should, however, be observed, that all epidemics become gradually milder on their decline, requiring very different treatment from that which was called for at the beginning, a fact which we should carefully bear in mind, both in regulating our measures and calculating the proportion of deaths. The mortality from typhus in our country, is certainly much greater than in the north of Italy, as is shown by the Milanese professor. This may have much to do with the circumstances under which patients may be placed, as well as with the period of the epidemic at which the calculation is made. "A large mortality," observes Sir Gilbert Blane, "may be considered as a presumption of an hospital being well conducted, as far as it indicates that the most severe diseases had been admitted, or, in other words, that the most judicious selection of cases has been made."[2] Rather than again recur to the rate of mortality, I may observe that in the Hotel Dieu it was one in three; in the fever hospital, calculated by Dr. Armstrong, as one in six. Dr. Bateman estimated it at one in twelve. But to return to our subject; antimony, although lauded so highly by Rasori, is not without its opponents. Dr. Bateman made use of it among other remedies in his early practice, but seldom prescribed it latterly, and expresses his disappointment with its use either in the solid or liquid form: he doubts too its diaphoretic power unless it excites constant nausea, which is objectionable in typhus, and considers on the whole, that it not only failed to produce the expected benefit, but actually contributed to augment the distress which it was given with an intention to relieve.[3] In the form of the potassio-tartrate it is employed by me, but by no means indiscriminately; the rules which guide its direction are chiefly to be derived from the condition of the patient. Antimony powerfully depresses the system; hence it obviously should only be used when there is inflammatory action and strength. Müller remarks of antimony, neutral salts, mercury and other substances, that "they act by producing a change in the blood, depriving it of its power of coagulating; this," he continues, "is of course effected by a change produced in the fibrine."[4] We may then see that in many cases its use would be of very questionable utility, and frequently absolutely inadmissible. It is however, frequently added to the salines of the hospital, either to the tartrate of soda draught, or to that containing spirit of mindererus.

Under the heads of bleeding, emetics, purgatives, salines and antimony, are comprised that portion of the treatment in typhus which

[1] Rasori sulla Febre Petecchiale, p. 25.
[2] Med. Chir. Transactions, vol. iv. p. 116.
[3] Bateman, p. 109. [4] Muller, p. 363.

is usually called by that unscientific appellation, antiphlogistic. No one speaks more decidedly in its favour than does Professor Rasori; in spite of the great loss of muscular power, the depressed look, the comparatively slight augmentation in the heat of the skin, or trifling increase in the frequency of the pulse, still he inflexibly enjoins depleting measures. Dr. Bateman also urges us not to allow "the appearance of languor and debility to induce the disposition to swerve from the antiphlogistic plan in diet, regimen and medicine."[1] My own observation has taught me fully to coincide with these views, and always to resort to some such measures at the first appearance of the disease. There is, however, a certain period when my conviction is decidedly favourable to remedies of an opposite class, not however given with the view of acting against the disease, but to support the power of the system. Some consideration of this other class will next be offered, after noticing one agent more, namely, the application of cold to the surface of the body, as an accessory to the division now under consideration.

COLD TO THE SURFACE OF THE BODY.

On ordinary occasions and in general practice we may consider that Dr. Currie's suggestion of cold affusion over the body is unadvisable and unnecessary. In certain periods of the year, however, and in warmer climates, such a plan may be advantageous. This method of reducing the temperature of the body is at all times better adapted for scarlet fever than typhus, but it was in this last disease that Dr. Currie first resorted to this energetic measure. An opportunity presented itself to him of trying it during very cold weather, in the month of December, 1786, when a contagious fever broke out in the Liverpool infirmary; eight patients were under Dr. Currie's care; he employed it in seven, all of which did well; the eighth was treated in the usual way, with bark, wine, and opium, but died: it appears, however, that this person was extremely weak before the disorder commenced. "I have preserved," says Dr. Currie, "a list of 153 successful cases of the low contagious fever in which the cure was chiefly trusted to this remedy."[2] The next occasion was in the month of June, 1792, when the typhus or jail fever made its appearance amongst the men of the 30th regiment. That the disease described by Dr. Currie is the one we have been previously considering may be inferred from the leading symptoms, which he informs us were pain in the head, suffused eye, great dejection, stupor, low delirium, debility, cough with expectoration occasionally streaked with blood, petechiæ and hemorrhage; he further remarks that this disorder was the low contagious fever of

[1] Bateman, p. 102.
[2] Medical Reports, vol. i. p. 7.

our country, the typhus of Cullen, the contagious fever of Dr. Lind, in popular language, called the nervous fever, and, when particular symptoms arise, more generally known as the putrid fever; points which clearly show that it is the same disease which we have now daily to contend with. Two and thirty cases occurred amongst the men in the regiment alluded to, of whom two died. The cold affusion was tried in thirty cases; it was made with water taken from the Mersey, which contains a thirty-second part of sea salt: this was poured on the naked bodies of the soldiers; it was employed sometimes once, sometimes twice a day, at various periods, from the commencement of the disease to the end of the first fortnight; the temperature of the water was from 58° to 60° Fah. All recovered who were thus treated; the two who died had been bled, but were from the first unpromising subjects, and had been weakened by previous residence in the West Indies.[1] Useful as such a remedy may be in warm climates, and during the hot weather even in our own, when we have to deal with the hardy bodies and daring character of the seaman or the soldier; it is clearly too inconsistent with the feelings and the habits of ordinary society to be generally advised, and in truth is not found by experience as serviceable as was at first supposed: still we may draw some important inferences from its use, and find some modification of the plan adapted to more general employment. We learn in the first place that we need not be too solicitous in keeping our patients warm, and that cold is not so prejudicial as many might be supposed to think; fresh air at any rate can be admitted with impunity. Next we learn that sponging the body may be freely practised, and is certainly of use, refreshing the patient, provided that we adhere to Dr. Currie's rule in taking care that the temperature produced be not lower than natural. Of course when pneumonia is present, or the mucous membranes inflamed, we should neither think of the affusion nor of the application of cold generally to the surface of the body. Its local employment, however, is allowable in certain instances, such as when the serous membranes are inflamed, or the meninges of the brain excited. Headache is a very early symptom, and in the regular and mild cases subsides before the others. The use of cold to the head is undoubtedly beneficial in this state, and quite imperative if active excitement has been produced. When inflammation has been set up, general bleeding from the arm should be practised if there be sufficient power in the system, but local depletion, by cupping, if the strength has been much reduced; and after these evacuations cold will not only be grateful to a patient, but tend to allay the excited action. This may be produced by evaporating lotions, or in a greater degree by ice broken into pieces of the size of a large nut, tied in a bladder, and applied immediately to the scalp, with the additional advantage of cooling the head, being free from the objection to wet applications, that of rendering the pillows damp and the

[1] Medical Reports, p. 15.

patient uncomfortable; or a stream of water may be poured on the head and continued for a time; this, however, cannot in general be borne long, from its depressing as well as cooling effect. Fresh sea water is not always at command for sponging our patients, as a substitute for which a mixture of one part vinegar to four or five of water may be employed on ordinary occasions. More elegant combinations of spirit of rosemary with mindererus spirit largely diluted, or eau de Cologne and water, may be substituted, but they do not possess any superiority over the more homely mixture of vinegar and water.

Cold internally in the way of drink is ardently desired, and may be freely allowed. The longing for cold fluids is so strong, and so great the comfort and pleasure they afford, that we cannot but think them salutary, or should not prohibit them without good evidence to the contrary. There can be no objection even to iced liquids in the early stages. Much has been said on this subject; the ancients allowed cold drinks in fevers, as also did Hoffman with restrictions. In Italy they were allowed, but Boerhaave, on the other hand, thought them dangerous, and he insisted that they should be warm, he was followed in this by Van Swieten. Cullen did not recommend cold, at least not universally. Hildenbrand advises the use of warm fluids, with a view of throwing out the eruption. Cold, however, may be permitted ad libitum. When the thirst is very intense and almost insatiable, instead of allowing the patient to swallow as much as he desires, it will be often sufficient that he wash the mouth, as the thirst arises in a great measure from dryness, which is owing to the want of secretion in the glands of the fauces. Nothing is more agreeable than cold water, or toast and water, which is the usual beverage of my patients.

STIMULANTS.

Stimulants are absolutely necessary at certain periods in many cases of typhus; the doubts which have arisen in the minds of some practitioners as to their utility are due to the injudicious administration of them. My object in their employment is either to counteract mere debility, or to remedy an actual morbid condition, when, after active determination to a part, congestion continues and gives rise to symptoms of irritation. Most authors agree that this class of remedies is to be shunned in the earlier stages. Dr. Bateman was so satisfied of this truth, that he says, "Whatever the supposed indication of debility may be in the earlier and middle periods, the administration of camphor, etherial fluids, and aromatic confection, &c., should be religiously avoided."[1] They are, however, sometimes indispensable, both early and late, in the disease;

[1] Bateman, p. 102.

but when used early they are only employed in an emergency, and then they must be abandoned as soon as the immediate object has been attained and the powers of life aroused. A good illustration of the necessity of their employment, and the necessity also of their abandonment as soon as their beneficial operation has been secured, may be found in Dr. Bateman's own work; where the following case is related, teaching him, as he says, a lesson which left an indelible impression on his mind: "A middle aged man was brought into the house of recovery in the lowest possible state of collapse, to all appearance in articulo mortis; the extremities were cold, the trunk bedewed with cold sweat, the pulse imperceptible at the wrist; in short, a heavy respiration and some feeble power of deglutition were the principal signs of life. Hopeless as the case appeared, I directed him to be kept warm, and to be supplied, at short intervals, with a tea-spoonful of wine, or spirits, as long as he could swallow. To my astonishment, I found him on the following day quite sensible, and loudly demanding food. The skin was warm, the pulse firm, and he had recovered a surprising degree of vigour. Fearful of withdrawing the support of some stimulus from a person whom I had seen the day before at the point of death, I continued his supply of wine; but on the following morning he was delirious, his eyes soon became red and ferrety, his skin hot, his pulse sharp and frequent, and in a few days he died with all the symptoms of phrenitis, terminating in effusion."[1]

Yet many now alive are solely indebted for their preservation to wine, brandy, and other stimulants; of wine it has been remarked by Hildenbrand, "the older and stronger it is the better;" but as it excites without strengthening the system, it should be combined, when there is real debility and exhaustion, with other things more capable of restoring vigour, and administered in every way that is grateful to the patient's taste, without much regard to quantity, until sufficient power is excited in the frame to maintain the improved circulation. Under this treatment, delirium and convulsions will subside, diarrhœa cease, a dry tongue become moist, the feelings of languor depart, strength be acquired and consciousness regained. There is no one period at which stimulants may not be necessary, though they are rarely so in the earlier stages, and are most serviceable on the decline of the disorder. To know the proper moment for their administration is a point of the greatest difficulty in practice, as there cannot be any positive sign to go by, no fixed rule upon the matter; the great object must be to maintain strength enough in the heart to enable the circulation to continue. Stimulants are not to be considered as an essential or necessary part of the treatment, and should neither be universally employed nor universally deprecated. Given upon the principle just laid down, they are admissible at all periods, and in every state of complication, provided that the heart is unable properly to exercise its functions; in other

[1] Bateman, p. 125.

words, during the existence of real debility. There is no one symptom that I know of which will preclude their exhibition, although we are told by M. Chomel that they should not be employed if delirium be present.[1] Still it is my firm belief that many now alive would have swelled our lists of mortality had this direction been invariably followed in the third or fourth week of the disease. The face will be flushed, the eye red, the skin hot, the mind wandering, nay, furiously excited, rendering coercion absolutely necessary, yet all this may be coupled with such signs of debility, indicated by the pulse and the coldness of the extremities, as to render wine and brandy necessary, which, so far from aggravating the symptoms, will often at once relieve them and rapidly lead to recovery. It cannot be disputed that vessels which have once been the seat of local excitement will remain passively dilated, and that such a condition may be remedied by means which are capable of giving tone to them, as is well explained by Andral.[2] On this subject it has been observed by Dr. Thomson, that "when fever is attended by evident symptoms of debility, the antiphlogistic plan is in many cases inadmissible." The term debility, it must be clearly understood, is not used solely to express feelings of simple languor or depression on the patient's part, nor the mistaken notions of weakness on that of his friends from observing the absence of muscular energy in the sick, nor yet the indirect debility produced by local inflammation, but that real loss of power which can alone be ascertained by a professional man, a state in which nothing like a general inflammatory condition is indicated by the skin, the tongue, or the pulse.

Under the head of stimulants, blisters and counter-irritations may be ranked; and of these some short notice must be taken.

COUNTER-IRRITATIONS—BLISTERS.

The employment of blisters, as practised by us, has been declared by Hildenbrand to be "barbarous," but no one who has witnessed their tranquillising effects, if well timed, can join in the condemnation of a most valuable assistant. I have known patients shrieking from pain in the head, distressed at light, and intolerant of noise, fall into a tranquil sleep on the application of this valuable remedy. Rasori condemns them because they are stimulants, which they certainly are, but when the brain is oppressed by congested vessels on the eve of pouring out a fatal effusion into the cavities of the brain, and when excitement and irritation are on the verge of lapsing into apoplexy or stupor,—is a useful stimulant to be then despised, or the beneficial application of a blister, even over the whole head,

[1] Chomel, p. 479.
[2] Précis d'Anat. pat. tom. i. p. 50.

to be avoided or looked upon as barbarous. Hildenbrand considers that the great advantage of this remedy consists in the ulceration which it produces, and in the relief obtained from the consequent discharge. We value them in this country as well for their exciting properties as for the alleviation that they afford to injected vessels. Consciousness will even return on their application when stupor has been produced. This stupor is looked upon as essentially adynamic by Chomel, who mentions two causes on which it depends, one is debility, the other sympathy with the intestinal canal. My remarks on the utility of blisters to the head refer to the first, but to the second when applied to the abdomen. In this country, blisters are usually placed near or upon an affected organ, but abroad very far from the parts which it is intended that their application shall relieve. Thus in affections of the head we commonly apply them to the scalp, the nape of the neck, or between the shoulders, but on the continent they would be put upon different parts of the lower limbs. Hildenbrand thinks the calf of the leg the most eligible situation, and recommends that they should be long kept open. Of this practice I am unable to speak from my own observation, but well know the advantage of mustard cataplasms when applied to the legs or feet: these have the additional advantage of rousing the brain and causing active determination to the lower extremities, which are often cold at the period when local stimulants are required.

We generally put on blisters at night, though some consider that the day time should be preferred, and in case of coma, either actually present or fast approaching, no time of course should be lost; in other cases, however, it is more convenient to apply them in the evening.

Sydenham advises their early use in fevers, where the head is much affected, and was himself in the habit of ordering one as soon as bleeding, his first step, had been practised.[1] This plan, however, likely enough to relieve headache in slight cases, would incur the hazard of aggravating it in severer ones. It has been urged against the employment of blisters,[2] that they are likely to give rise to gangrene; but I have never seen any ill effect of this sort resulting from them, but an irritable state of the skin sometimes comes on, which may easily be allayed by soothing measures.

It cannot be necessary to enumerate here the means we employ to accelerate the action of blisters, nor the ordinary cautions to be observed with respect to the length of time either they or the sinapism should be allowed to remain in contact with the skin, which should not be longer than enough to produce the desired effect, nor should a blister ever be kept open, as an over-stimulus to any part will probably be attended with troublesome or serious consequences.

[1] Sydenhami Opera 8vo. Lugd. 1726, p. 224.
[2] Chomel, p. 25.

SEDATIVES.

Much has been said by different authors upon the use of opium in typhus. Dr. Bateman considers that opiates should be banished from practice, and wishes their entire rejection from the list of remedies. Rasori thinks that they are always erroneously employed to procure sleep. Hildenbrand says "we have used opium recommended by Sydenham, Brown, Cullen, Campbell," but considers that it increases stupor, prolongs the disease, produces dangerous metastases and apoplexy, prevents good from other remedies if given in large doses, thinks it is of no use in smaller ones, and adds that the English do not sufficiently consider its narcotic and poisonous effects. If, however, there is any one remedy of which the advantage is undoubted—if the immediate subsidence of untoward symptoms follows the exhibition of any medicine—if future amendment be the test of utility, then is opium a valuable remedy: but it is not to be employed largely at any period, nor resorted to in the first stages, nor when stupor is present or approaching; but if given at that period of the disease when there is increased action without power, and all the signs which indicate irritation, good will invariably result. Sydenham well knew the value of opium, and he freely employed it in the exanthematous diseases; of its use in small-pox he says, "medicamenta paregorica æque indicari in variolis confluentibus mihi videntur, ac indicatur quodvis remedium in quovis morbo; cum hic quasi specifica sint perinde ac cortex peruvianus in febribus intermittentibus." He goes on to state the good effects: "quamvis haud ignorem paregorica non virtute aliqua præcise specifica operari, sed isti solum indicationi respondendo, qua sanguini et spiritibus consopiendis, et in ordinem redigendis, operam damus." Further he adds, "at quod dicere animus mihi erat, difficile est admodum paregoricorum dosin, quocumque in casu ista indicantur certo determinare. Etenim ea methodo sunt exhibenda, ut si prima dosis metam non attingat, alia atque alia debito tempore adsumatur, donec tandem medicamentum medici votis responderit; non tam ad ingestam anodyni quantitatem quam ad effectum, quod in ægro producendum erat, respectu habito."[1]

Hamilton, Armstrong, and Gooch, have borne testimony to the efficacy of opium in subduing inflammatory action. Dr. Stokes comes to the conclusion, that when depletion by blood-letting, or other antiphlogistic means is inadmissible, and the system is in a state of collapse, the exhibition of opium has a powerful effect in controlling the disease. But it is neither in subduing inflammatory action, nor as a remedy against collapse, that opium exerts its most signal effect in typhus; it is in that state which Sir Gilbert Blane has observed to be indicated "by tremors, pervigilium, and low

[1] Sydenhami Opera, 8vo. Lugd. 1726, p. 372.

delirium."[1] Of these signs the "pervigilium" is the most important. Vigilance is the guide to our employment of opium; this is the morbid state which opium is most calculated to remove. To quote a case or two in illustration of this fact seems to me almost absurd, when it is shown in hundreds at the hospital; it is there a daily occurrence to find that a patient, who has been without sleep for several nights, whose whole frame is in a state of tremor, actuated by some erroneous idea, and constantly endeavouring to get out of bed, falls into a tranquil slumber on taking a dose of opium, and awakes refreshed and conscious, after several hours of calm and gentle sleep, during which the secretions will often be restored, the tongue becomes moist, and a warm perspiration breaks out. It is not by large doses of this medicine, or its principles, but upon their right application that good will depend; nay, small doses answer the purpose in very many cases, and to repeat small ones, as Sydenham advises us, is safer practice than to give a large one: our object is not to oppress, but to soothe; to do enough, but no more. A valuable paper upon this subject, by Dr. Latham, was read before the College of Physicians, and is to be found in the tenth volume of the Medical Gazette. On the subject of the dose, I am sure that no apology need be made for quoting a few passages from the paper alluded to. The author observes "that the success of the remedy turns entirely upon its procuring sleep; and it is more or less complete in proportion as the sleep procured is, within certain limits, of longer duration. When, therefore, in a case of fever after long wakefulness, accompanied by wild delirium and a violent exertion of muscular force, with such a state of pulse as absolutely forbids the use of further depletion; when in this extreme case we administer the extreme dose (for such it is) of twenty minims of tincture of opium, we must be content to wait patiently the result: for the use of every other remedy is now sacrificed to this single one: indeed, while it is in the course of operation, the effective employment of any other is necessarily precluded. In cases where the delirium and excitement, accompanied by wakefulness, are less in degree, a smaller dose of opium may be relied upon for effects equally beneficial. In such cases I have been accustomed to give five minims of the tincture every hour, or every other hour, until the patient begins to doze."[2]

Dr. Bateman's objection to opiates therefore, that "they not only fail to relieve the distressing symptoms, but actually increase the disturbance of the sensorium, and the general distress, and at the same time parch the tongue, augment the thirst and heat, and continue to lock up the alvine discharges and other excretions;"[3] must have reference to the improper mode of employment or period of the disease at which they are administered. The results from the exhibition of opium show that the state of the brain essentially

[1] Sir Gilbert Blane, p. 256.
[2] Lond. Med. Gaz. p. 15.
[3] Bateman, p. 110.

varies in different periods of the disorder; given early in the disease it will produce all the ill consequences noticed by the last-named author, and as he says, may then be decidedly injurious, and aggravate instead of relieving the symptoms intended to be remedied, but which if properly employed, it is capable of permanently alleviating. Opium acts here as in delirium tremens, and with good reason, for the state of the brain or its membranes is identical in the two cases, as Dr. Latham has remarked.[1] Dr. Marsh also notices the resemblance of the cerebral symptoms in fever to those which occur in hard drinkers, and in such as have kept their minds continually and morbidly excited.[2]

There is still another condition in typhus when opium is likely to be of service, and that is during sloughing. Dr. Thompson says, that there are very few cases of mortification in which if the patient survives for any time, it is not at some moment required.[3] In the case of Davis, (related Case XXXIX,) this medicine was freely employed; it tranquillised the system, procured rest, during its use the secretions were restored, the appetite returned, and to its beneficial influence recovery in that extraordinary case is mainly if not solely to be ascribed.

Hildenbrand preferred camphor, but opium or morphia is employed by me as a sedative, being the most certain and the best, but it may be combined with hyoscyamus, a practice which would be right in the case of children; but they rarely require any such remedy, the head affection being much slighter with them than with adults.

TONICS.

It is highly important to know what substances have been tried and found unavailing in the cure of typhus, as well as to learn what are likely to prove beneficial. Again, therefore, shall I refer to Dr. Bateman, whose work bespeaks as much candour as ability: he says "it is to be wished that cinchona were erased for ever from the catalogue of medicines employed for the cure of this disease. In the early part of my practice, agreeably to the doctrine of the times, I resorted to the decoction of cinchona on the first appearance of languor and debility, the increase of the symptoms was easily imputed to the untractable nature of the disease, or deemed the necessary result of its progress, until it became obvious from the repeated occurrence of the fact, that the tongue which had been on the day before the administration of the bark moist, and exhibiting a gray or yellowish mucous fur, was on the following morning dry, or even brown; that the skin was hotter or more parched, with a flush on

[1] Lond. Med. Gaz. [2] Dublin Hospital Reports, vol. iv. p. 501.
[3] Lectures on Inflam. p. 178.

the cheek; that the pulse was quicker and harder; the thirst increased, and the sleep more disturbed. That these are the effects of cinchona, in the fever which I have had occasion to treat, even when the patient has made some progress toward recovery, so long as any fur continues to whiten the tongue, I have had such manifold proofs, that I have of late scarcely ever prescribed it, even during the state of convalescence; having again and again witnessed a return of headache, with the concomitant symptoms of irritation during that state on the commencement of the use of this medicine.[1]

It is not a work of supererogation to extract this passage, for Hildenbrand especially directs the use of bark as a means of correcting the putrid character of typhus.

Tonics, at least the stronger bitters, do not seem a very manageable description of remedies: and I seldom resort to their use, from having been repeatedly obliged to abandon them. Quinine was given with apparent benefit in the case of Davis, above alluded to, in combination with opium; but in this instance all original febrile symptoms had subsided for several weeks. Hildenbrand prefers the arnica montana, and also speaks well of angelica, valerian, calamus aromaticus, contrayerva, and serpentary, which is praised in all works on materia medica as a valuable remedy in typhus, from its combination of diaphoretic with tonic properties; but we must not forget that this disease goes through a certain course, and we should rather look to assist the processes of nature, or at any rate not to counteract them, than by endeavouring to force perspiration, or prematurely to give strength, incur risk of aggravating the disorder, or occasioning a dangerous relapse. It is easier to say when tonics should not be used, than predict with certainty that good will result; they should not be given till all fever has subsided, the skin become moist and the tongue clean, and then the lighter and purer bitters only, such as hop, calumba, or gentian, should be tried. The mineral acids may be usefully employed; the diluted sulphuric acid in the form of compound infusion of roses, either singly, or in combination with a bitter, is one of the best tonics after this or any other of the exanthemata.

RESTRAINT.

If there is furious delirium, and patients feel the singular inclination for self-destruction, or from great apprehension and mistrust of those about them are likely to attempt it, restraint is of course necessary to prevent their inflicting injury upon themselves or their attendants. The strait waistcoat may be employed; but there is an objection to its use in fevers, and in those disorders in which there is increased temperature of the body, especially where

[1] Bateman, p. 130.

it is desirable to reduce the heat by sponging, &c. The mode of coercion employed at St. Bartholomew's Hospital is by straps which confine the patient to his bed in a supine posture; and these on the whole are superior to the old fashioned method. Something on the score of prejudice is to be considered, and there is certainly much less apparent violence in applying the straps than the jacket, which in popular belief is more used in mania than delirium. These straps are made out of girthing of the ordinary width, and of sufficient length to be attached by tongues and buckles to the frame of the bed on either side. Three are usually sufficient, they are placed immediately beneath the patient, one under the shoulders, another beneath the loins, the third under the ancles. To these straps thus immoveably fixed, smaller narrow ones are attached, and so adjusted that when the patient is laid down they can be made to confine the ancles, the arm above the elbow, and the wrists. It is sometimes necessary to pass a fourth strap over the chest when the patient is very furious and unmanageable, but this is not very often required. A patient may thus be completely secured or partially liberated; by keeping the ancles alone fastened he will in some cases be sufficiently restrained, or these may be freed while the arms remain fixed. By this method the person is secured in a position best adapted for the performance of those measures which may become necessary in the treatment of typhus, such as the introduction of the catheter, the injection of enemata, &c. Besides this, the moral influence of restraint is advantageous even in delirium; those previously furious will often at once become tranquil, and when thus coerced make no objection to whatever is recommended for them; it is better to employ the straps than incur the hazard of irritating the patient by opposing an inclination to quit his bed or room, especially if he be powerful, and exhibit other signs of resistance and violence.

Under the head of treatment, some useful hints may be given, and some important auxiliaries be alluded to, for instance the water bed. This proved extremely serviceable in several cases where suppuration from a considerable surface had taken place: it is a source of great comfort, not only by removing pressure from an irritated part, but from the equable support which it affords. The great advantage which may be derived from it was strikingly illustrated in the thirty-sixth case, one nearly allied to carbuncle. By this ingenious suggestion of Dr. Arnott's we are now enabled materially to relieve suffering, and thus to accelerate recovery.

It is very often necessary to draw off the urine, as patients seem insensible to the impression which is produced in health by undue distention of the bladder; it is therefore not only important to inquire whether or not it has been lately evacuated, but to ascertain its real condition by an examination of the hypogastric region;

for although some water may have dribbled away or been passed, still the bladder may be distended, as we know to occur in retention from other causes. When this takes place, it is essential that the urine be drawn off night and morning.

There are many suggestions in Professor Hildenbrand's work,[1] which are quite contrary to any ideas entertained in this country, such as compelling the patient in the earlier periods to take exercise by walking about the room, supported in the arms of attendants, or rousing him several times in the course of the day, with the view of dissipating the stupor. There are also many remedies which deserve notice from having been tried, but without having their utility confirmed: such for instance as the chloride of sodium. M. Chomel administered it internally, and bathed his patients with it; at first it bade fair to prove valuable, as he only lost two out of twenty patients in one year; but in another, his mortality was twelve in thirty-seven. He then tried carbonic acid, but still more died; so that both these modes of treatment were in turn abandoned as unsuccessful.[2]

In connection with this division of my subject, reference may be made to those indications and appearances by which we may form a probable conjecture as to the future result of any case.

As typhus has certain periods to be gone through, and as great and striking alterations are not to be expected when the disorder runs its longer course, and as the symptoms are very alarming, and well calculated to excite serious apprehensions in those around the patient, we must watch accurately all the signs which may be exhibited, so as to enable us to entertain and to impart hope and encouragement, where there is so much to dread, and where those ignorant of the profession must naturally be ready to despair. It is, however, important for our own reputation that the encouragement afforded them be based on substantial grounds. Some of these signs will therefore be cursorily noticed.

Rasori says, that the severity of the attack is in proportion to the affection of the skin; this by no means accords with my own observation. I have often seen a very favourable disease follow a most abundant crop, both of the exanthematous spots and of the petechiæ: and in cases of scarlet fever, according to my own experience, fatal results most commonly occur when the earlier symptoms are mild. In typhus, more is to be inferred from the course of the symptoms, than from either the mildness or severity of their commencement. It is of better augury that the disorder be severe at its onset and readily yield to active remedies, than exhibit less signs of urgency at its beginning, and the patient show early real indication of debility. We cannot speak much of good signs at the commencement, nor need we; but there are some indications of an opposite tendency, such as either furious delirium or the most extreme prostration,[3] which are calculated to justify doubts. It is

[1] Hildenbrand, p. 264. [2] Chomel, p. 458. [3] Ibid. p. 434.

only as the disease advances that we can form more decided opinions on this head. We must not be sanguine when the symptoms of the period, which Hildenbrand has denominated nervous, come on earlier than usual; when, for instance, there is a black and dry tongue, tremors of the limbs, a tendency to dysentery, a position low in the bed and invariably flat upon the back, absence of consciousness, and want of power to retain the evacuations. Tendency to hemorrhage is a much more serious omen late than early in the disorder. Extreme rapidity of the pulse is very much to be dreaded; whenever it is 120 we cannot be without apprehension for the result; and in proportion as it increases in frequency, our expectation of a favourable termination must diminish. A medical man well knows how to appreciate a return with aggravation after a partial subsidence of the symptoms. There are few indications of a more alarming nature than that which has been called in medical language carphologia, which means picking the bed clothes. This, or a movement of the hands, by which patients appear to trace some imaginary object passing before them, never occurs but in very serious cases, and at a time of great peril. It has been attempted to explain this symptom by supposing a partial loss of power in the retina; this cannot, however, always be the case, as the automatic movements will continue after the patient's eyes have been completely closed, so as to exclude all possible access of light.

Deafness, which annoys the patient, and is a source of great anxiety to friends, is by no means a bad symptom. Dr. Bateman indeed looked upon it as favourable. An inclination to take nourishment is decidedly a good sign, but the best of all, and the one upon which I mostly rely, is the position of the body; an easy inclination on the side may always under any circumstances inspire us with confidence and hope.

DIET.

Little need be said upon the subject of diet, as the ordinary rules of treating febrile disorders will also apply to this. The appetite itself is a guide to us, cold drink is all that is desired at the commencement of the attack, and all that is necessary to be given. The first drinks may be whey and barley or toast and water. Milk is our next step, and the vegetable jellies, tapioca, sago, arrow root: but nothing stronger than these should be allowed, according to Rasori and Bateman, till absolute convalescence. Cases, however, will occur where nourishment must be supplied; and beef tea, animal jellies, as isinglass or calf's foot jelly, may then be liberally allowed; these, however, should be withheld during the inflamma-

[1] Chomel, p. 439.

tory period, and when the pulse is sharp, though mere local inflammation must not deter us from administering wine and nourishment, as it is neither bad nor inconsistent practice to address such means to the system generally while we are even cupping and leeching to relieve local inflammation; this double treatment is often necessary, and I am sure is very beneficial. We are told that relapses frequently occur abroad, but with us they are extremely rare; the fever goes regularly through its course, all complaint ceases, and weakness alone remains. That the disease has terminated, is in most cases obvious enough; the countenance acquires its natural character, the tongue becomes quite clean, the skin soft, and the appetite craving; if it be indulged, disturbance of the system will be induced, but by carefully withholding the stronger nutriments until this period, and by taking care that when they are allowed it should be in moderation, there is little apprehension of a relapse.

PROPHYLACTIC MEASURES.

Typhus prevailed to so formidable an extent over Italy in 1817, that it was found necessary by the government to take precautionary measures for the public safety. Officers were appointed, whose duty it was to purify houses, and lazarets were established, admission into which was strictly prohibited to all but the sick and their attendants: on quitting them all were submitted to the sanatory process of fumigation, &c. Such rigorous measures have not been necessary with us: still a modification of them is occasionally called for; when, for example, this infectious disease breaks out in prisons or workhouses, it becomes imperative to separate the sick, and to cut off their communication from those in health, to diminish numbers in a given space, to increase rations, to grant additional allowances, and to purify apartments by whitewashing, &c. The temporary prevalence of such a disorder has led to the permanent establishment of fever hospitals or houses of recovery, both in London and the provinces; these institutions are real blessings to a community when the alternative is between a patient's admission into such an establishment and being left at home to contend with disease under every disadvantage of bad ventilation, ill attendance, and want. At Manchester and Liverpool, such hospitals have been founded with the happiest effects, relief is afforded to the sick, and extension of the malady by contagion prevented. The necessity for some such asylums and their value will readily be imagined, where the regulations of hospitals prohibit the admission of patients labouring under infectious fever: but a question arises as to their utility and benefit when no such exclusion exists; in my opinion it is both injurious to patients and hazardous to attendants that many cases of infectious fevers should be brought together, and it

is my belief that a certain proportion may without injury be admitted into the wards of any hospital. The remarks of Dr. Currie upon this subject are apposite and just.—"Contagious disease," he says, "and more particularly fevers, have in general been excluded from the hospitals of England, those of London, perhaps, excepted; but the evidence of our own infirmary and workhouse, of the Chester Infirmary, and of various similar institutions, proves that under proper regulations they may be admitted under the same roof with other diseases, without danger of infection spreading through the building."[1] But it will require a nice calculation to state the proportion which fever ought to bear to other diseases, and nice calculation also of the rate of mortality in hospitals thus regulated, and in those exclusively appropriated to fevers, before we can pronounce with any certainty on this subject.

The professor of the college at Lyons, proved by repeated trials that under ordinary circumstances, small-pox is incapable of infecting any individual at a greater distance than two feet, either in the open air or well ventilated apartments. Experiments were tried to ascertain the fact. Children were every day placed round a table, three feet in diameter, in the centre of which was variolous matter on lint and silk, both of the natural and inoculated variety. No effect resulted after nine months. He then placed four children at the distance of two feet from a child ill with small-pox for an hour daily for a fortnight. No effect, however, followed, but when inoculated, they all took it.[2]

The propriety of removing persons infected from a crowded neighbourhood is obvious enough whether they be taken to one or other hospital, and that their removal will arrest contagion we cannot doubt; of this Dr. Bateman gives us several marked instances,[3] the importance of which fact is however often overlooked.

The best of all prophylactic measures are ventilation and good diet; to these I cannot hesitate to refer the greater immunity of this city at the present time from the attacks of pestilential fever than in former days, and it is important to bear in mind, when the subject of any epidemic febrile disease is under consideration, that for many years this country has enjoyed comparative freedom from visitations of such a nature. In former years, London, like many of the eastern capitals at the present day, was constantly the seat of devastating pestilence; and it is only within the last two centuries that it has been exempt from the almost annual recurrence of some one of those awful calamities which cannot be contemplated without horror even at this distant period. A disorder perfectly new to our hemisphere has indeed lately shown itself amongst us, but the incursion even of this has been characterised by a mildness which furnishes important matter for reflection, whether regarded in a legislative, a statistical, or a medical point of view: but while we

[1] Currie, Med. Reports, p. 363.
[2] Bateman from O'Ryan, Diss. sur les Fièvres. [3] Bateman, p. 169.

congratulate ourselves on such a change, and inquiring into the causes of this altered state of things, attribute them to an ameliorated condition of the community in habits of life, in clothing, in cleanliness of person, in the better ventilation of apartments, in the widening of streets, in the removal by drainage of noxious effluvia, and in the more abundant means of purification by a liberal supply of water, still we find that much remains to be done by those whose province it is to look back to the past for instruction, and to whom the present should be indebted for improvement.

Our immediate objects, however, now, are the actual measures to be adopted in the sick room, which shall be most serviceable to the patient and protective to the attendants. Dr. Bateman has well stated the points which should chiefly be regarded, and has witnessed and recorded their effects. Ventilation and cleanliness alone, he says, are adequate to the effectual prevention of the spreading of infection in any dwelling; and the freshness and freedom from all sensible taint, which they produce in the atmosphere of a room, is the best test of the absence of all noxious matter;[1] and I have had reason, he continues, to infer that the invigorating influence of fresh air, with coolness and cleanliness, is sufficiently great to modify both the character of the disease and the treatment which it may require or bear.[2]

It will, doubtless, always be a matter of difficulty, nay, of practical impossibility, to introduce even these simple prophylactics to the full extent into the habitations of the poorer classes, partly from the mode in which their dwellings are often constructed, but still more from the customs or prejudices of the people, who for warmth as well as from necessity crowd themselves together, and habitually exclude the free admission of air from their apartments. The period of the year too, at which typhus is usually prevalent, namely, in the colder months, militates against these sanatory regulations. This disease may prevail at any season, but Dr. Bateman said that in his time there was always during the autumnal months the greatest disposition to fever in London, which diminished on the approach of winter. Dr. Willan found that fevers exhibiting signs of malignity usually commenced in September, and extended by infection during the months of October and November, but that their progress was usually arrested by the frosts of the succeeding month.[3] Dr. Armstrong remarked that typhus usually prevailed in the winter and spring. Rasori first met with the petechial fever which he has described in the autumn of 1799, it continued during the spring, and was still prevalent, and the mortality considerable, on his departure from Genoa in the summer. When this disorder raged at Exeter, in 1586, it first appeared in March. The black assize of London in 1750 took place in May. The jail fever at Oxford occurred early in July. Sir John Pringle notices the

[1] Bateman, p. 155.
[2] Ibid. p. 105.
[3] Report on the Diseases of London, p. 43.

appearance of typhus in hot weather; no season is therefore exempt from its attack; like the other exanthemata, however, according to my experience, it prevails most in spring and autumn, though occurring at all times of the year. We have the best information from Dr. Currie concerning the prevalence of typhus in different months. Taking an average of seventeen years, he found that the largest number of cases took place during the month of March, but says that "the prevalence of fever is greater, and the influence of season upon it less, than might have been expected."[1] And truly the prevalence of fever was great in Liverpool during the seventeen years referred to, as it appears that out of 213,305 dispensary patients, attended between the years 1780 and 1796, 48,367 laboured under typhus.[2] It does not seem that the time of year has any obvious effect upon the number of deaths. M. Chomel at least has found that the rate of mortality was the same in summer as in winter.[3] The disparity of numbers between male and female patients is certainly not so great in this country as in France, where M. Louis tells us that one fourth only were females, but with us the mortality appears certainly greater among the men. But to return to the prophylactic measures: we must not relax either during winter or summer, nor must the round of the seasons fix a termination to our care, as a disease will prevail epidemically frequently for more than a twelvemonth. Dr. Bateman indeed, says, that the celebrated one of 1801, which led to the foundation of the Fever Hospital, continued with severity during four years.[4]

It would induce a smile were I to detail seriatim the precautions which M. Hildenbrand has recommended, that medical men should take, when in attendance upon patients labouring under typhus: they certainly would not be followed, or if adopted, would seem to betray an apprehension which is totally unknown to our practitioners; a feeling of duty will always strongly actuate every class of society in this country, and be paramount to any considerations of personal safety. Such was the case when the plague last broke out during 1665, in our then devoted city; such was the case when cholera approached our shores: and although summoned to encounter a disorder formidable both from its novelty and from its ravages, alacrity was shown on all sides to meet the exigencies which might arise and to provide for the public security. We may smile at undue apprehensions, but should not disregard proper ones: for we have seen that our profession has suffered in a greater extent during the prevailing epidemic than in any other for nearly half a century before. The prophylactic measures necessary to be adopted when typhus breaks out in camps or in other crowded situations, will be found in various treatises on the subject: to detail them does not come within the scope of my work, but I may add that Sir James Macgrigor, in his Sketch of the Medical History

[1] Currie, Med. Rep. vol. i. p. 355.
[2] Ibid. see table, p. 354.
[3] Chomel, p. 448.
[4] Bateman, p. 9.

of the British Armies in the Peninsula of Spain and Portugal, has laid down those leading rules, which are calculated to prevent disease and check its progress, under circumstances where typhus has so often proved a real pestilence, and which, he adds, "at Ciudad Rodrigo, Celorico, Viseu and Coimbra, appeared in the most malignant form it has ever assumed."[1]

CONCLUSION.

It only remains for me now to reconsider the views which with great diffidence have been suggested in the preceding pages, and to state the objects which have chiefly been aimed at, and which it has been my endeavour to prove. In the first place the belief has been expressed that an exanthematous disorder now exists in this country as yet undescribed as such by any of our own authors, or to be found in the catalogue of eruptive fevers drawn up by the most eminent nosologists. With this disorder I have now been for many years familiar, and conceiving that the opportunity afforded me in 1831, of studying its character justified my calling the attention of the profession to it, a paper on the subject was in that year submitted to the College of Physicians, declaring my conviction of the specific nature of the disease, and describing its peculiar rash. To this fever, in a printed account, it was proposed that the term "typho-rubeoloid" should be applied, as I was not then aware that the disorder had been fully described by Professor Hildenbrand, and designated by him to be typhus. This discovery led to the immediate abandonment of my idea of originality in its detection, and induced a more close investigation of those fevers which have been called typhus, as well of the various epidemics which have prevailed at different times, and of the common fever of our country. It will not be necessary for me again to enumerate the peculiarities which characterise the disorder alluded to, but it is sufficient to state that it conforms in all respects to the laws which appear to regulate the genuine exanthemata. We find that it is capable of spreading from one individual to another—that it conforms to certain definite rules—that it shares even the peculiarities and anomalies of the eruptive disorders. It seems allied in character to measles and scarlet fever, but differs from each in its aspect, duration, and sequelæ: although it has, I believe, been often confounded with these complaints, being sometimes mistaken for one sometimes for the other, or else supposed to be an entirely anomalous complaint.

It may indeed be asked if an exanthematous disorder so different from all others could in reality have escaped detection till near the middle of the nineteenth century, and be now for the first time dis-

[1] Med. Chirurg. Trans. vol. vi. p. 402-463.

tinguished and classified. It may appear almost incredible that so common a disorder should have escaped the notice of the numerous writers upon eruptive fevers, at least it appeared so to me when I consulted Willan, Bateman and Rayer, expecting to find a description of this malady. My search into their writings was fruitless; still the disorder continued to present itself, and the more the subject was considered and authors consulted, the more satisfied I felt that this scourge of cities in the time of peace, this companion of armies more fatal than the sword, this walking pestilence more relentless than famine, was a specific, definite, and eruptive disorder. It does indeed seem scarcely credible that this should have been overlooked; but is it more extraordinary than that measles and scarlet fever should have been confounded together until almost our own time? We have now become so familiar with these complaints, and know that each has sufficient peculiarity in its mere aspect, to enable us oftentimes to declare a case to be one or the other without asking a single question. Yet it is well ascertained that these two disorders were even very recently confused, and both are frequently alluded to under the same appellation. Morton, the court physician, the contemporary of Sydenham, who lived and wrote at the close of the 17th century, maintains that measles and scarlet fever are the same, and declares "Hunc morbum prorsus eundem esse cum morbillis censeo et solo efflorescentiæ modo ab illis distare. Quæ differentia tanti non est ut alterum morbum constituat, nisi pari ratione variolæ confluentes et distinctæ cæterique morbi ex accidente aliquo inter se differentes, ubi causæ, symptomata, prognostica, curativæ indicationes, atque methodus medendi, ab invicem minimè distent, in diversos morbos dividantur." In the last century, and even towards its close, Sir William Watson described a severe attack of scarlet fever under the title of "Putrid Measles," and from the confusion of terms employed, it is clear that these two disorders were not then accurately distinguished from each other, nor in truth were they clearly defined, and their nomenclature established till the year 1781. If then measles and scarlet fever were so lately confounded together it will not appear very surprising that typhus should have hitherto escaped notice, as there is much less difference between that and measles than between measles and scarlatina. For eight centuries measles and small-pox were not distinguished from each other; but this inquiry need not proceed further; as we shall surely cease to be surprised at the detection of a new exanthema. Between all the eruptive disorders there are certain points of resemblance which we should carefully remember, although we see abundant grounds for distinguishing them from each other, and for considering them as distinct disorders, each dependent upon its peculiar source.

In employing the term new exanthema just now, it was not meant that there is any new complaint amongst us, the epithet only referring to its supposed recent recognition. Authors who have written upon measles and scarlet fever, have been anxious to claim for each

of them all the pride of ancestry, and have delighted in mounting to the highest antiquity in searching for their origin.

An opportunity is here afforded me of tracing amongst ancient writers an account of the different pestilences which are more or less allied to typhus; but such details are more learned than useful, more interesting than practical, and indeed diseases of this class were formerly but little studied individually: it was only when they prevailed extensively that they attracted much notice, and the descriptions given are rather calculated to impress upon us the severity of calamities which are more frequently distorted by the inaccuracy of poetical exaggeration than described with the fidelity of simple truth. It has been already shown that the term typhus was not applied by Hippocrates to any one disorder, and certainly not exclusively to the one which we thus designate; but we may rationally believe that this very fever was seen, and depicted by him. In his third book, speaking of the pestilent constitution of seasons, he particularly alludes to one during which much erysipelas with ardent fever, attended by urgent symptoms, prevailed, and speaks of many cases of excitement or stupor, and says that ulcers, suppuration and falling off of the flesh and nerves took place. Other cases which he calls phrenitis well exhibit the leading characteristics of typhus, both in the symptoms and duration. Thus he tells us that a young woman of Abdera, who lived near the Via Sacra, had an attack of fever, she was intensely thirsty, and could get no sleep. On the sixth day she menstruated, there was redness of the skin, with great delirium; on the eighth day she was deaf, and it was remarked that she continued so for some time afterwards; hemorrhage from the nose then occurred; on the twentieth day all the symptoms disappeared and she was declared convalescent; a slight relapse, however, afterwards took place, which speedily subsided, and she then completely recovered.

Many other cases might be cited from this author exhibiting the general features of typhus, but the futility of such researches has already been contended for. No other example from Hippocrates or any ancient writer will therefore be given, for it would clearly avail us little could the fact be proved that the disorder was familiar to the earlier physicians, when we know how limited was their practical skill, and how erroneous their views of pathology. Many bare truths have been long known, which, from confined notions or from want of other acquirements, mankind have not been able to turn to account. The discoveries of Copernicus, when revived after several generations by Galileo, were slighted by ignorance, and denounced by fanaticism.

The humoral pathology, for a time banished from medical reasoning on the etiology of disorders, contains vast truths, which we can now understand, and in some degree correctly explain: but to return.

Armstrong, Bateman, and Currie, each describe a fever under the name of typhus, so analogous in origin, mode of propagation, early

symptoms, progress, and results, to the one now prevalent in this country, that it is impossible to withhold the belief that they are identical and certainly specific. Is it to be supposed that a disorder can continue for fourteen years, as stated by Dr. Bateman, sometimes almost extinct, then again bursting out with violence, consistent in all essential particulars, presenting time after time the same phenomena, and spreading by infection, but yet not be specific. Can we suppose that any but a specific disorder would for the seventeen years alluded to by Dr. Currie, year after year follow a definite prescribed course. It is surely unlikely that a disorder noticed for nearly a quarter of a century by Hildenbrand, and constantly exhibiting such points of similarity as induced him to pronounce it to be distinct, could have been other than what we call a specific disease, that is, one itself a species. The fever described by Rasori in Italy, under the name of petechial, that by Huxham in our own country as the nervous, that by Pringle, seen in different parts of the world, and known as the jail or camp fever, are so analogous that it would be carrying refinement in classification beyond all reasonable limits, to doubt their resemblance or to hesitate about arranging them together. Many may object to the propriety of placing in the order of the exanthemata these several disorders, the identity of which it has been my endeavour to establish: it may be urged that the eruption is frequently absent, but this, as it has been attempted in the foregoing details to prove, is not an absolutely essential feature in any of the recognised exanthemata, for we have "morbilli sine morbillis," "scarlatina sine exanthemate," nay "variola sine variolis." The eruption in typhus, though present, will often elude notice from being partial and confined to the trunk of the body; and even when universal may still be so faintly developed as only to be detected by the eye of one whom experience has made familiar with the disease; but still Armstrong, Bateman, Rasori, Huxham, Louis, Pringle, and Chomel, have all remarked the existence of a rash, although they have not insisted upon this incident as an essential feature, which should afford a basis for classification. Let, however, typhus show itself in Germany, in France, in Italy, or in England, it is found not only to exhibit a rash, but one in all cases corresponding, similar, and characteristic. This rash is merely briefly mentioned by some authors, by others it is confounded with, or improperly called petechiæ. Real petechiæ are often present, apparently as substitutes in place of the eruption. More quotations than are given might have been added, which would show that this feature has been present, and yet little dwelt upon; for instance, Dr. Cheyne, who had such ample opportunities of observing this fever, says, that in the epidemic prevalent in Ireland to such a formidable extent during 1816, petechiæ were met with more commonly than usual, and that some patients had *a florid rash*, others *a measly efflorescence.*

If disorders, thus conforming in all essential particulars, and in many cases in all minute details, be not as I believe one and the

same, it is clear that we are in want of some more accurate information concerning them. In the investigation of the laws which regulate typhus, several interesting points concerning eruptive diseases struck me with more force when thus treated of and arranged as general facts, than they did as individual ones—thus the frequency with which measles and small-pox may attack the same person is much greater than is commonly supposed, as both will frequently occur in the same individual twice during life—then, again, the slighter constitutional effects from any of these poisons, such as the fact that during the prevalence of scarlet fever hundreds would suffer some slight affection of the throat, without other "local or constitutional ailment," which assertion I can confirm by my own experience, having often found that when the younger branches of a family are labouring under scarlet fever, parents and servants, though otherwise in good health, will all complain of sore throat.

My third object in the preceding treatise may appear still less easy of demonstration: it is an attempt to explain some of the phenomena in eruptive and inflammatory fevers, by reference to certain states and alterations in the vessels themselves. Analogy alone here forms the ground of reasoning, as when minute structure is in question, it is a matter of extreme difficulty to show the changes which it actually undergoes. The ideas entertained by me upon this point are, that the poison of typhus enters the blood, and so infects the system. It does not, however, follow, that the disease will manifest itself, even although the circulating fluids are so contaminated, or infected, as to produce the disease in another. The symptoms, it would seem, arise not from the admixture of the poison with the blood, but from the action of the fluids thus diseased upon the vascular and nervous systems. With this view I have not asserted that inflammation is always excited in the vessels, but that irritation invariably results whenever constitutional symptoms appear; that this irritation is partial, and chiefly affecting those textures called mucous by Meckel, namely, the pia mater, the cutaneous tissue, and the membrane lining the lungs and abdomen. It has been shown, that in the more severe cases, the irritation in these various parts often goes on to acute inflammation, of which state, as excited on ordinary occasions, we have all the usual symptoms, although appearing in a modified form.

A fourth object has been to distinguish between that exanthematous disorder, to which it is proposed that the term typhus should be restricted, and the morbid state often confounded with it and denominated "typhoid," from the resemblance between certain features in the two. Now in ranking together under the head of typhus many disorders variously designated, I only follow the example of Dr. Burne, and many of our recent as well as more ancient authors. M. Chomel, indeed, goes so far as to say, that he considers all inflammatory, bilious, and mucous fevers as modifications only of one disorder; and Dr. Chambers in his lectures, as reported in the Medical Gazette, not only classes together the

varieties of typhus and the synocha and the synochus of Cullen, but appears to consider them all analogous to the remittent fevers, and ascribes their origin to some such epidemic or endemic influence as gives rise to the marsh fever. There is, however, I conceive, a sufficient distinction between fevers which arise from atmospheric sources and those produced by specific animal poisons. In some fevers arising from malaria, there may be great depression of strength, and a black dry tongue, but yet I do not think that these should be looked upon as typhus, since the diseases which arise from atmospheric influence do not exhibit the characteristic features of the exanthemata, namely, propagation by infection, and a definite course. It may be long before these disputed points are settled, and it is difficult to say, when a disorder attacks a community, to what cause its spreading is to be referred; we all remember how general was the belief in the infectious nature of yellow fever, which was even supposed by some to be after all but one form of typhus. Very few, however, if any, can now be found to advocate the doctrine of contagion in that most formidable disorder. It appears to me, that a great cause of confusion in the classification of fever arises from the circumstance of its being based on a wrong foundation.

In the artificial system of Botany, external resemblances were once considered sufficient to form a groundwork of arrangement; but the moderns, dissatisfied with so superficial a method, declare that the intimate structure of plants is the only sound basis for classification; so, also, as our acquaintance with the nature of disease advances, should we look for a more natural order than formerly, by ascending to the causes of phenomena. Experience lessens the value of mere symptoms, as the indices of an organ's condition, or rather as trustworthy guides to direct the administration of remedies, for we daily learn that opposite conditions can produce very similar effects; proving how imperative it is carefully to search after the causes, by the meeting and removal of which, diseases can alone be eradicated. To attain this desirable object is in many cases extremely difficult, but we have now learned to appreciate the influence of external agencies, and know the sensibility of internal organs to stimuli. Majendie, Fontana, and others, have proved the absorption of a host of extraneous substances into the circulation, and their action when thus introduced is, according to M. M. Addison and Morgan, on the sensible structure of the bloodvessels; by these means we are made acquainted how poisons obtain entrance into the system, and may be said almost to witness the invasion and commencement of disease.

It would then be very important to class fevers as far as possible from the causes out of which they originate. Cullen separates them into continued and intermittent; an objectionable arrangement from the fact that the same source frequently gives origin to both. In more modern works, they are divided into continued, periodic and eruptive, but an eruptive disease is often a continued one, according to the definition of this class, namely, that it proceeds without

abatement or apyrexia; and many eruptive diseases are periodic, in the ordinary acceptation of the term. A more rational division of this class can, perhaps, be made, by simply dividing them into symptomatic and specific. For no febrile action or actual fever will be produced and continue, without there is such a cause as disturbed action in some part of the system, to excite the symptomatic fever, or without there should be some specific influence in operation on the other. Specific influences are either of atmospheric or animal origin, such as small-pox, and the disorder which I have thus imperfectly attempted to treat. Other ideas here suggest themselves, but I have already exceeded the bounds in which it was proposed to confine my undertaking.

As this professes to be nothing but a short treatise on the prevailing epidemic, brevity has been constantly aimed at, and the works of many writers of our own, as well as of foreign countries, bearing upon this subject, have been consulted during the composition of the preceding pages, without extracts or quotations being given; not that the opinions are valueless, or the names without weight, though frequently assertions have been met by contradictions, and theories opposed by theories, with endless reference to conflicting authorities; these have been passed over as only calculated to raise doubts; to have stated the opinions of every writer would have been much too comprehensive, and even to have consulted all whose writings bear upon the subject would scarcely have been practicable; for, to use the language of Johnson, if permitted to compare small things with great, to have done so "would have protracted my undertaking without end, and perhaps without much improvement, one inquiry only gave occasion to another, book referred to book, to search was not always to find, to find was not always to be informed; and thus to pursue perfection was, like the first inhabitants of Arcadia, to chase the sun, which, when they had reached the hill where he seemed to rest, was still beheld at the same distance from them."

THE END.