

Lectures on the nature and treatment of fever / by D.J. Corrigan.

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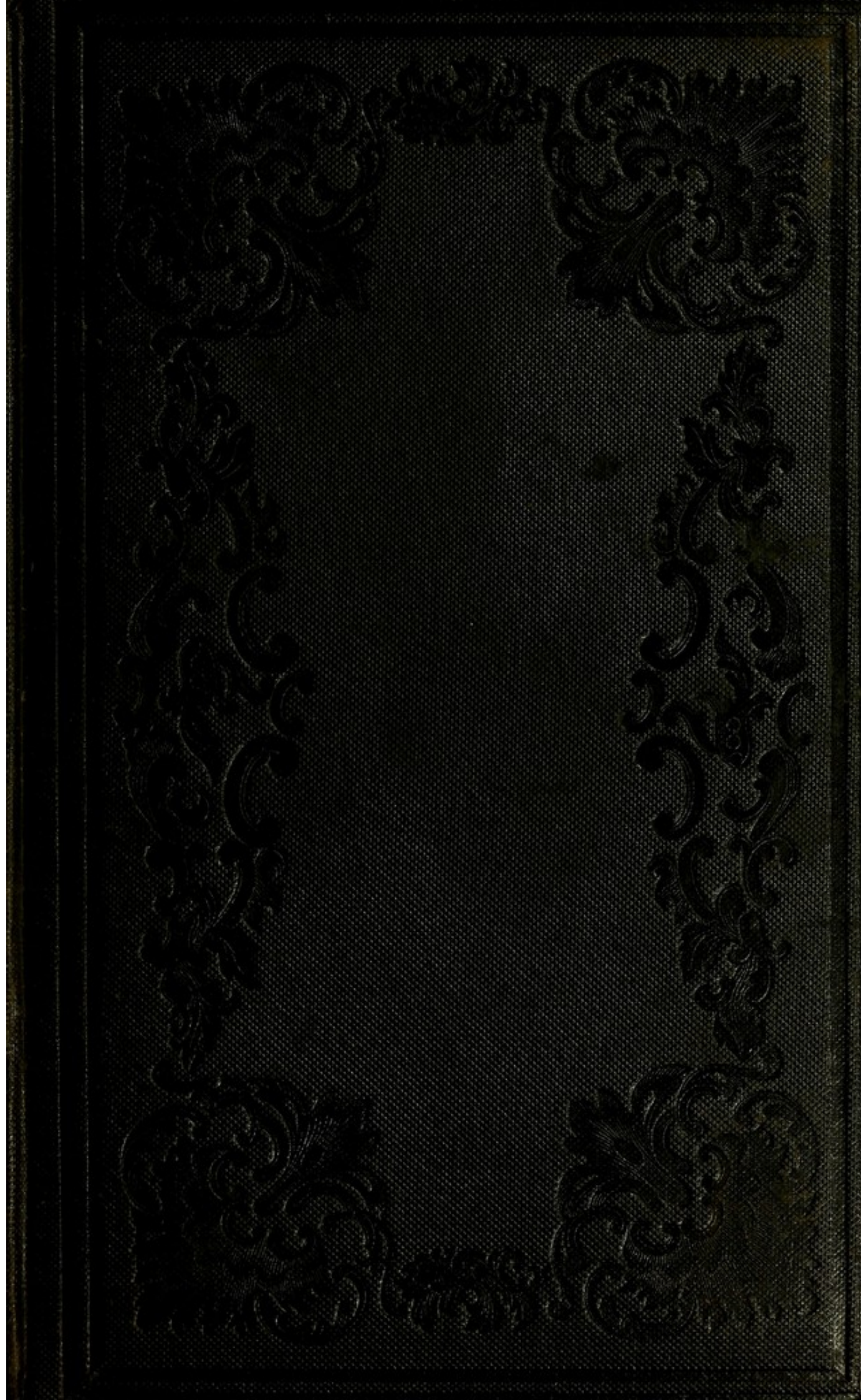
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Comp.

ON THE

NATURE AND TREATMENT

OF

FEVER.

BY

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TO

SIR PHILIP CRAMPTON, BART.,

SURGEON-GENERAL TO THE FORCES, AND SURGEON IN ORDINARY TO THE QUEEN IN IRELAND,

AS A TRIBUTE OF PROFESSIONAL RESPECT,

AND OF PERSONAL REGARD,

This Volume is Inscribed,

BY

HIS OBLIGED AND GRATEFUL FRIEND,

THE AUTHOR.



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P R E F A C E .

THE following Lectures have in part appeared at irregular intervals in the Medical Gazette, Medical Times, and Dublin Hospital Gazette. I have re-arranged and enlarged them into a continued and connected series, flattered by the solicitations of many of those kind friends and pupils who have attended my "Clinique" at the Hardwicke Fever Hospital; and who desired to possess in the present form a record of the mode in which we analyzed and studied Fever together.

If these Lectures do not contain reference to the works by name of the many able writers who have done so much for the investigations of Fever, this omission has arisen, not from any want on my part of a full appreciation of their merits, but from the consideration

that these Lectures are not intended to be a lengthened essay upon the subject, and ambition no farther than to present to the advanced student and junior practitioner an explanation of principles applied to the Nature and Treatment of Fever which have been deduced from long-continued and careful clinical study of the disease.

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ON THE

NATURE AND TREATMENT OF FEVER.

LECTURE I.

IS FEVER A PRIMARY OR A SECONDARY AFFECTION?—ESSENTIALLY A PRIMARY DISEASE OF FUNCTION.—IMPOSSIBILITY OF MAKING A DEFINITION OF FEVER.—ITS CHARACTER AND DENOMINATION DERIVED FROM THE FUNCTION MOST PROMINENTLY AFFECTED.—PRACTICAL MODE OF VIEWING FEVER.

It shall be my object to make these Lectures as practical as possible. As a student, I experienced great difficulty and dissatisfaction in the study of Fever. As a lecturer, I long felt, I laboured under equal difficulty in my endeavours to convey information on any systematic principles. To relieve me from these difficulties I applied myself to study the disease almost altogether from actual observation, analysis, and comparison of cases in hospital. The results at which I have arrived I shall now lay before you. They have enabled me to attain, at least for myself, clearer ideas of the nature of the disease than I had previously possessed, and I hope I shall be able in explaining them to convey with clearness

the views which I submit for your consideration of the Nature and Treatment of Fever.

The differing opinions as to the nature of the disease may be divided into two great classes,—the first comprising the opinions of those who consider fever a primary disease; the second, those who consider fever to have no existence as such, but see in it only the aggregated symptoms, or the consequence of some local or structural lesion. Of those holding this latter opinion the greater number have considered typhus fever as the constitutional disturbance, or collection of symptoms produced by inflammation of the follicles of the intestines. The point at issue is of great practical importance, and we must, therefore, devote some attention to its consideration, for on a solution of the question at issue, viz., whether fever is a primary or secondary disease, will mainly depend the principles that are to explain and to guide our treatment.

To solve this question we shall refer to cases occurring under our own observation in the hospital, and they will, I think, most clearly demonstrate that typhus fever is a primary affection, having an existence independently of any local or structural disease whatever. The case of Geoghegan, in Ward No. 1, will illustrate this. We saw him comatose, lying on his back, with muttering delirium, sordes on his tongue and teeth; pulse of 132, and skin thickly maculated, with great prostration of strength, involuntary stools, and sensibility so much diminished that the eyelids remained immovable, and the bladder had ceased to act. A crisis took place,

and in less than two days, of all the above alarming symptoms debility alone remained; the pulse became regular, the tongue clean, the sensibility natural, sleep returned, and not a trace or symptom of local or structural alteration was discoverable. It is surely not reasonable to suppose of such a case, that structural disease or local inflammation, of several days' duration, sufficient to produce this aggregate of alarming symptoms, could have so suddenly vanished. Even in the mildest cases of the most ordinary and unimportant local inflammations we rarely if ever see such rapid recovery, and still less can we admit its occurrence where its severity, supposing it to exist, was such as to have given rise to the aggregate of symptoms described. Let us now contrast with the case of Geoghegan, and its sudden transition from impending death to almost perfect health, the prolonged case of Purcell, in the same ward. In Purcell's case there arose in the course of the fever an undoubted complication of disease of the mucous tissue of the intestinal canal,—and how different has been the course of the two cases! There has been no sudden and rapid recovery in Purcell's case; his illness has been prolonged, his flesh wasted; his amendment has been slow and interrupted; relapses of diarrhœa and tormina have been frequent, and it has not been until after a period of some weeks that we could consider him to be satisfactorily convalescent.

We have, however, still more decisive evidence on the point before us. Honoria Walsh died on the fourteenth day, with all the ordinary symptoms of severe typhus fever.

The immediate cause of death was sudden effusion on the brain and into the bronchial tubes. She died just at the period when the maculated fever was at its height, when, supposing the fever to have been dependent on disease of the follicles of the intestines, these should have been found affected in a degree corresponding with the severity or duration of the general symptoms. But so far was this from being the case, that, after a most careful and searching examination, we could discover only one trifling patch of Peyer's glands a little more developed than natural, but neither redder than usual, nor ulcerated. It would not be tenable to assign the extreme degree of constitutional disturbance which existed in this case, the aggregation of which was typhus fever, to a local alteration of so trifling amount.

William Gray, a groom, æt. 40, was admitted on the third day of fever, suffering under great prostration. His face was congested; the depending portions of his body, and the extremities, were of a livid red colour, and the surface cold and maculated. He died on the second day after admission into hospital, the fifth day of his illness. He was rapidly struck down by intense typhus. What did we find on post-mortem examination of this case? No organic disease whatever. The brain was perfectly sound; the heart remarkably firm and muscular; there was no disease in the lungs; and the most careful examination could not detect any trace of disease in the intestines. So little tendency was there to any affection of the glands of the intestines that they were not even sufficiently developed to enable us to discover them with the naked eye.

J. Kelly, ætat. 54, admitted into Hardwicke Hospital 27th February, 1846. He was in a state of great debility, and wandering in mind; his tongue dry and brown; pulse thready, 130; skin hot, dry, and pungent, thickly maculated; little or no sleep. On the 2nd of March debility was greater, and the stools passed under him. He still continued to sink, but without any complication; the pulse became scarcely perceptible at the wrist. Wine and stimulants from the commencement failed to rouse him, and he died on the 10th March, the eleventh day after admission.

Post-mortem.—The most careful examination failed to discover any local disease.

The conclusion, then, at which we must arrive is, that fever, or the aggregation of functional derangements, to which we give the name of fever, is not dependent on any structural lesion whatever. But if it be not dependent on any structural lesion,—if no structural lesion be necessarily present,—if even, more than this, death will take place without any structural lesion whatever, the conclusion is inevitable, that fever is to be considered as a primary disease of function, having an existence independent of, and capable of proving fatal without, any local or structural lesion.

Let us now, having laid down this groundwork, proceed to analyze fever,—to resolve it into its component parts. Let us, without laying down any hypothesis, or proceeding upon any theory, say what it is we observe when we look upon a case of fever. We observe all the most important vital functions simultaneously deranged,

viz., cerebro-spinal functions; the nutritive functions including assimilation, secretion, and excretion; and the function of circulation. Suppose these to be simultaneously and equally deranged, we have then before us, in these combined lesions of function, the component parts of an aggravated case of fever,—the lesion of the cerebro-spinal system, or what we may call the lesion of innervation, in prostration, want of sleep, delirium or coma; the lesion of function of nutrition, in total want of appetite, dryness of skin or of tongue, morbid state of urine, &c.; the lesion of circulation, in lividity, maculæ, and feebleness of pulse, &c. &c. We can at once understand how this simultaneous lesion of so many important functions must soon terminate in death. We see that even one of these lesions—that of the cerebral system—is sufficient of itself to cause death; of this we have an example in delirium tremens. We can, therefore, readily understand how the simultaneous derangement of several may prove fatal. Advancing a step farther, we can also comprehend how the proportions in which these vital functions are deranged may vary very much, and hence the impossibility of laying down a definition, or even a description of fever, which will be applicable to all cases.

There can be no definition of inflammation, because what we call by that name is an appearance or compound phenomenon produced by the combined lesion of several primary vital functions, circulation, secretion, innervation, &c. These primary functions are possessed by different tissues and organs in different proportions, and

even in the same organs or tissues the proportions in which these primary functions are affected will vary; and in a similar degree will vary the characters belonging to inflammation. So it is with fever, several most important vital functions are simultaneously deranged; the cerebro-spinal functions, the functions of nutrition, and the functions of circulation, are affected, but the proportions which their derangements bear to one another may not be exactly alike in any two individuals, and hence the definition which applies accurately to one case may not suit a second. Each instance or case of fever will derive its distinguishing character from the function which appears to present the most marked deviation from health. Although it will hence follow that a definition of fever cannot be completed, still a most useful and practical comprehension of it, including its varieties, may be attained. All cases of fever will concur in this, that all are characterized by simultaneous disturbance of most of the great primary vital functions. The circulation is not much disturbed in one case; but then there is great disturbance of the function of innervation. In a second case the cerebral system and intellect are scarcely at all disturbed, but the circulation sinks rapidly. In a third case, the function of nutrition, including secretion and excretion, is arrested, or unduly excited; while in a fourth, the nervous, circulatory, and nutritive functions may be all overwhelmed together. Not only the proportionate degrees, but the order in which these functions are deranged, will vary. Thus, although it is evident that we cannot construct any definition that

would include all these varieties, we can recognise in this analysis the foundation of that loose but really useful division of fevers into—brain fever, nervous fever, gastric or bilious fever, typhus fever; each case deriving its specific name from the lesion of the function which is most prominently attacked.

I have thus endeavoured to develop a view of Fever founded on observation and analysis, keeping clear of all hypothesis or theory, going as far as observation and reasoning, and our present state of knowledge, will justify, but not one step farther.

Let us now consider fever as a functional disturbance of all or of a number of important vital functions; the vital function, whatever it may be, which is most deranged stamping the characteristic feature on the individual case, and commanding in treatment the first place in our attention, always, however, recollecting that from the intimate relation, chaining, as it were, these vital functions together, an aberration in one may soon run through the whole, until the fever will mount up to its most terrible form, with circulatory, respiratory, nutritive, and cerebral functions, all and in equal degrees deranged, and with death as the result, imminent if not certain.

LECTURE II.

DIVISIONS OF CONTINUED FEVER.—INFLAMMATORY FEVER, OR SYNOCHA.—TYPHUS FEVER: TWO FORMS OF.—FIRST FORM.—SECOND FORM.—CRISIS: BY SLEEP; PERSPIRATION; DIARRHŒA; URINE.—CRITICAL DAYS.

WE may for practical purposes consider continued fever under two great divisions: inflammatory fever and typhus fever; the latter as presenting two well-marked forms or subdivisions.

The first is the inflammatory fever, or synocha of Cullen. The patient, on the first or second day of the attack, and generally after a short but well-marked rigor, is seen with a florid countenance, a quick, full, throbbing pulse, and a creamy, soft, white tongue; the skin, although hot, often, however, affording to the hand laid upon it a sensation of still appreciable softness, as if the insensible perspiration had not been altogether arrested, and a few rose-coloured patches are perhaps seen on the most heated parts of the surface. This case, or the class of cases of which it is an instance, might at first be expected, from the high inflammatory tendency of the symptoms with which it has been ushered, to run a course of corresponding intensity, these symptoms being but the commencement of an attack of severity and tedious duration. It will not, however, generally prove so: such

cases will almost invariably proceed favourably, scarcely requiring more than very ordinary attention. They terminate in a few days (generally within the week) with gentle continued diaphoresis, or quietly subside without any marked crisis; but are more liable to relapse than the severer forms.

Typhus fever admits of a division into two forms or classes: the first when the attack sets in with a heavy congestive stage, somewhat resembling the cold stage of ague; the second when the onset of the fever is gradual or almost treacherous, its commencement being so insidious that there is often difficulty or an impossibility in saying at what precise time the fever commenced. The cases of the two brothers Herbert were good illustrations of the first form. One of the brothers presented himself at the hospital gate for admission immediately on his falling sick; he walked from his work to the hospital. His aspect will not easily be forgotten: he was a robust man, and had been previously healthy and strong, yet he was, as it were, struck down by the onset of fever. He was chilled and sunken; the expression of his face was anxious; his eyes were congested, with dark pinkish conjunctivæ; he looked drowsy, and appeared to be staggering; his lips were bluish and livid, and his pulse was quick, weak, and small. This form of typhus fever is always severe and heavy; reaction hardly follows; the maculæ are thickly set; dark-coloured petechiæ or patches of ecchymosis become mingled with them, and the patient, even through the crisis, does not lose the aspect of heavy congestion. This may be truly called congestive

typhus. Its rapidity is sometimes terrible. I lately saw a patient in this form of typhus, who, although ailing from the previous Sunday, felt himself, however, sufficiently well to dine out on Wednesday. I saw him on Friday afternoon: he was perfectly conscious, but his countenance was anxious, lurid, and heavy; the conjunctivæ congested; he was breathing like a man hurried after exertion; his pulse was 120, weak, and occasionally intermittent. He had no thirst; his tongue was dry; skin natural as to temperature, but thickly covered with maculæ of a dark colour. He lay on his back, which also was covered with maculæ thickly set, and very dark-coloured; the bowels were free, the urine dark coloured, muddy, and without sediment; next day the pulse was more rapid and more intermittent. He continued to sink. At a late hour, 10 o'clock P. M., the pulse had sunk still more, but he was quite collected, and questioned me as to his state. He died in four hours after. In such cases it is obvious that the function of circulation has given way almost from the commencement, and that from the lesion of this function the patient died.

The second form of typhus fever might truly be called insidious fever. It is a form you should well remember. The first deviation from health is perhaps scarcely appreciable in most instances, and it is most often very difficult to define its commencement. The patient has been probably for many days, as he describes his state, merely ailing, and perhaps continues at his ordinary pursuits up to the moment of his seeking for advice, which is probably on the sixth or seventh day of fever,

and even then he hardly believes himself ill, and only seeks assistance or consents to remain in bed at the urgent solicitation of his family, who remark that he looks heavy and ill. When questioned at this period, he says he only feels weak, and without appetite, and disinclined to leave the bed; and he attributes the flying pains, which he only mentions when questioned, to his remaining so long in bed. When such a patient is first seen there seems at first sight little to excite alarm. There are only the creeping pains in the back or limbs, or in both; there is perhaps no headach; the pulse is not above 88, and the tongue is only slightly coated and of a light grey colour: yet such a case will almost certainly be severe and continued, and in a few days more, life may be in a mere balance. Were it not for ample experience, it would be quite impossible to anticipate that in such cases as this described, the danger could soon be so urgent. This form of fever now described will, however, go on with increasing aggravation to the ninth or tenth day, when the patient may become delirious, and quickly afterwards, perhaps, comatose; or, remaining still without sleep, becomes most restless, the whole nervous system continuing in an uninterrupted state of agitation, resembling delirium tremens; the pulse rises in frequency, and sinks in strength; and the case becomes an accumulation of symptoms constituting the worst form of typhus fever. What is it that makes the danger so great in this form of fever? There is neither local lesion nor particular symptoms of great urgency for several days, but every vital function is more or less deranged, and al-

though the derangement of each may be individually of no great degree, yet the aggregate amount, when all are more or less affected, becomes at last sufficient to overpower the whole system, and to terminate life.

As it is of importance that we should be familiar with this form of fever, I shall go over, a little more in detail, the symptoms which characterize it in an early stage, when there might appear to an inexperienced eye to be no very serious danger. The patient's muscular strength and nervous energy are reduced; he feels, as he describes himself, weak as a child. The sinking of strength is further expressed in the countenance, which is dusky and anxious, with an eye often only slightly congested, but without any marked heaviness. The cerebral system is deranged in its functions. There is no stupor, but there is no sleep, or it is unrefreshing and uneasy. There is generally in this early stage nothing remarkable in the respiration, but the circulation is a little quicker than natural. The pulse at first is perhaps not above 86 or 88, but the next day it is 92, the day after perhaps 98 or 100, and thus it goes on, rising from day to day. There is all this time no evidence of local disease to account for or to correspond with this daily increase of frequency of pulse; yet as surely as the pulse proceeds in this way, rising in frequency from day to day, while the muscular strength is diminishing, there is danger threatening. In the state of the intestinal canal there appears no particular cause for apprehension. The evacuations are natural, and the abdomen is soft; the tongue at first sight seems natural, or it is very little altered, but if it be not

dry, or slightly brown, it is of a grey colour, not with a creamy grey, or with a coat of white mucus, such as is presented in inflammatory fever, as already noticed, but as if the villosities of cuticle on its surface were stained grey. The patient in this early stage of fever may keep his mouth closed, and breathe through his nose, so that he preserves the tongue somewhat moist; but even then, if the finger be passed over its surface, it gives a feeling of dryness, or want of secretion, and on looking closely it will be seen that the papillæ are elevated, and more dry than natural. If questioned as to thirst, the patient replies, and the nurse hurries to say, that he has no thirst; that he does not call for drink; and this is often supposed to be a favourable sign—to be a sign of the mildness of fever; for no other reason, as far as I know, than that, in simple inflammatory fever, there being often great thirst, it is erroneously supposed that the same rule holds with typhus fever, and that when there is no thirst, the fever cannot be dangerous. This supposition is ill-founded. Want of thirst is the extreme degree or aggravation of want of appetite. It proceeds from the assimilating power of the digestive organs being so completely arrested that, even when the tongue is dry, there is not the ordinary instinctive desire for drink. I attach considerable value to the presence or absence of thirst. I have often foreseen approaching aggravation of a case from the warning symptom of absence of thirst, or cessation of desire for drink, and I have been equally enabled to anticipate the coming change of amendment, when almost the only symptom to indicate it was the accession of thirst. Thirst—

the desire for drink—tells us that assimilation is going on; that the digestive organs are again absorbing; that the function of nutrition is again recovering its power; the desire for drink is the instinctive calling for the supply required. A little reflection will satisfy us that this view is reasonable, and that it would be as inconsistent to consider absence of thirst as it would be to consider loss of appetite a favourable symptom. The fact appears to be, that the want of desire for fluids shows the extreme degree of loss of action in the function of nutrition, including assimilation, secretion, and excretion, of which the preceding loss of appetite for food showed only the minor degree.

If the urine be examined, it will be almost invariably found that, on being placed in a glass vessel, and allowed to remain at rest, it is higher in colour than natural, and held up to the light, shows no deposit, but merely a cloud formed of scales of epithelium suspended in the fluid.

The skin, the next object of examination, appears at first to be natural, but if the hand be placed upon it, although it seems not hotter than natural, there is a dry, biting sensation given by it to the hand, which is both disagreeable and is characteristic of its not maintaining its function of insensible perspiration. It totally wants the slightest approach to that soft feeling that is often conveyed even from skin much hotter. The sensation is like that received when the hand is laid on the side of a hot-air stove, and probably arises from its robbing the hand quickly of its moisture. If the skin be in this early stage carefully examined by the eye, some ma-

culæ will probably be detected about the epigastrium, abdomen, and loins. They may be few in number, or so numerous as to mottle the skin, and yet at first so little differing in colour from it as to render it easy to overlook them; but they become more developed from day to day, and petechiæ may then begin to be interspersed with them. Follow up such a case, as you can readily do,—with the cerebro-spinal functions, the functions of nutrition, including assimilation, secretion, and excretion, and the function of circulation becoming more and more deranged from day to day,—and you can, I think, readily understand how, at last, the united lesions of these important vital functions will constitute an aggregate in the whole sufficient to destroy life, although in the commencement the lesion of each of these functions, taken singly, did not appear sufficient in degree to cause much danger, or to create any great apprehension.

If a case of fever, in either of the forms as we have sketched it, terminate favourably, it generally terminates in what is called “crisis,” by which we now understand a sudden change to recovery, usually accompanied by some marked or increased secretion. This is intimately connected with the subject of critical days, of which we have all heard so much. I hope to make it clear that the occurrence of crisis is explicable on and in accordance with the analysis of fever which I have followed throughout. Crisis, or the change to recovery, may take place by sleep. Crisis by sleep is a most favourable change. Even those out of the profession are well aware of this. The patient, who has been delirious, or with little or no

rest for days, falls asleep, sleeps soundly, and almost continuously for many hours together, awaking only for a drink, and reason and recovery quickly follow. Why is this? It cannot be explained on the supposition of any structural lesion whatever having existed, but it can on the analysis we here adopt. We see in this sleep the restoration of the natural rest and function of the cerebral and nervous system, and we can understand that where interruption and derangement of these important functions have constituted the principal lesions of function, sleep should be the natural crisis or cure. In another case perspiration occurs, and it marks a return to a healthy state of the functions of secretion,—an important part of this great function of nutrition. The same observation will apply to diarrhoea. In a third case the urine becomes suddenly altered in character. From being light-coloured, scanty, and cloudy, showing only scales of epithelium, it suddenly becomes copious, and is loaded with salts and organic deposits, which we shall more particularly describe in a future Lecture. This may continue for several days, the crisis of recovery going on “*pari passu*.” In this we see the evidence of a restoration of the great function of nutrition, of which excretion is so important a part, and we can understand how thirst and appetite return at the same time; and we can also understand how perfect and sudden may be the crisis, and how rapid the recovery, when sleep and loaded urine concur in the crisis; for then the cerebro-spinal and nutritive functions are simultaneously returning to health. We can also understand from these views why hemorrhage,

occurring in continued fever, whether the result of art or nature, never constitutes a crisis, as it is merely the loss of that fluid which furnishes materials for the functions of secretion or excretion, and which may take place to any amount, without restoration of those important functions.

The subject of crisis naturally leads us to some observation on critical days. I do not believe in critical days, that is, I do not believe there are any specific days on which crisis is to occur, or that any one day has more virtue than another in terminating fever. I once paid great attention to the investigation, but I soon saw it was so often impossible to determine exactly when fever began, that it rested very much with the investigator's fancy as to what day he might fix on as its commencement. The tenth day has not been reckoned a critical day, nor the eighth day; and if the crisis appeared to occur on either of these days, it was not difficult to make out some symptom which would throw back or forward the date of the commencement of the fever, so as to make the eighth day the seventh, or to convert the tenth into the eleventh day. But while there cannot be accorded, I believe, to any one day more than to another, any peculiar efficacy in accomplishing a crisis, it will, however, follow from the views we have here adopted, that either crisis or death must take place in any case of continued fever, within some certain number of days, within some limited time, governed by the state of constitution, and the amount of lesion of function involved; for it is obvious that life cannot continue if those functions, on the per-

formance of which life depends, are indefinitely interrupted or annulled. We see a man die in delirium tremens from the interruption of an important lesion in the functions of the cerebral system, viz., want of sleep, and from this alone, for we find no essential structural disease ; and if we see death from this cause alone, we can, I think, comprehend without difficulty how continued fever, which consists of several lesions of function, of which this is only one, must either end in crisis or in death within a limited number of days ; but this will be intelligible without attributing to any one day more influence than to another.

LECTURE III.

MODE OF SURVEYING A CASE OF FEVER.—CEREBRO-SPINAL FUNCTIONS, DERANGEMENT OF.—WANT OF SLEEP: DANGER FROM IT.—TREATMENT OF.—DISADVANTAGES OF PRIVATE PRACTICE.—MANAGEMENT OF LIGHT, ATTENDANCE, ETC.—LEECHING.—COLD.—OPIUM.—HYOSCYAMUS.—DELIRIUM AND COMA.—CEREBRAL BREATHING.—SUBSULTUS.—AGITATION OF CRISIS.

As we stand at the bedside of a patient ill of fever, if we view the disease as consisting of a simultaneous disturbance of several vital functions, we take, I believe, the best practical view for treatment. We may consider the continuance of life as depending upon the continuous performance of those functions, and the danger, as proportioned to the amount of derangement in any one, or to the aggregate of lesion in all. Let us now examine in detail the derangement of each, and estimate the effects of the total derangement in all.

The functions which it is most important to us to consider in thus regarding a case of fever are :—The cerebral or cerebro-spinal; the circulatory with the respiratory, and the functions of nutrition, secretion, and excretion, including the functions of the kidneys, skin, &c. &c. Let us take up these functions, in successive order, for examination. By doing this we obtain the best practical

view of each case, and we acquire a steady and orderly method of going through the symptoms, and a power of rapidly detecting the lesion of the particular function from which most danger is to be apprehended.

The first function we shall consider is the cerebro-spinal. The great danger of a lesion of function of this system need not be dwelt upon,—a lesion, which if it continue long, must terminate in death, either from the direct effect upon itself, or from implication of the functions of organic life. The lesion of function of this system in fever is most often manifested by want of sleep, by want of natural rest of the system. Of this alone a patient may die as in delirium tremens, in which death takes place, and yet no organic disease is necessarily found; so that if want of sleep continue for a few nights, delirium, and coma, and nervous exhaustion must follow. There was an example of the progress of derangement of this function in the case of Murphy, a policeman, in Ward No. 1. He had suffered when he came in for some days and nights under total want of rest; he then began to rave, and furious delirium soon followed. The phases under which we may consider lesion of the cerebro-spinal system are, want of sleep, delirium, subsultus, and coma.

I cannot too strongly impress upon you that want of sleep is to be regarded in fever not as a mere symptom, but as a lesion of function, which is of most serious consequence, and which, if continued, must terminate as abovedescribed. Viewing it thus, we see the importance of asking :—"Has the patient slept?" If the patient has passed night after night sleepless, it is quite clear that

under such circumstances life must be endangered. If the patient have passed a second night without sleep, we must not allow this derangement of function to continue longer without endeavouring to rectify it. Then comes the question,—what is to be done in order to restore the natural rest to this function. In answering this question, let me again impress upon you that want of sleep is not a symptom, but a part, and most serious part, of the disease. The treatment resolves itself into two heads:—1st. The general management of the patient and of the sick-room. 2nd. The remedies to be employed.

Under the first of these heads I may observe, that nothing can be more marked than the difference (in relation to the lesion of the function we are now considering) between the patient in an hospital and in private practice. In the latter case, want of sleep usually sets in early, and is much oftener followed by delirium and coma than in the lower classes. There are errors in the management of the private patient which greatly increase the liability to want of sleep, and in consequence of which many, I have not a doubt, have fallen victims. What is the plan usually adopted with regard to attendants in such cases? It is most often this:—Two nurses are generally employed, and from that moment a continued noise or whispering is perpetually kept going; and of all the torments to which it is possible to subject a fever patient, I know perhaps none more intolerable than a continued succession of whisperings. A patient under such circumstances strains all his faculties to catch—no matter at what amount of tor-

ture to himself—the slightest whisper that may be made. To obviate in some measure this source of annoyance, as well as sounds that must be borne, I have sometimes ordered the patient's ears to be stuffed with cotton. One very remarkable case that occurred to me is strongly illustrative of the above observations. A gentleman who came up from the country caught fever, was speedily followed up to town by his mother and sister, one of whom constantly took her post at the foot of the bed or at the bedside, and was either continually calling on the unfortunate patient to speak to her, or forcing him to swallow drinks every other minute, so as most effectually to deprive him of all chance of sleep. He died; and I cannot have a doubt but that this well-meant but ill-directed kindness, by depriving him of rest, hastened if it did not cause his death. Another very marked contrast between the hospital and the private patient, and to the disadvantage of the latter, consists in the practice as to the admission of light. Here in hospital we are in the habit of admitting light and air, and the mortality is far less than in private life, where it is too often made a rule to exclude every ray of light except from the flickering flame of a candle. This, together with the perpetual motion of the nurse or some member of the family about the room, most effectually deprives the patient of the most distant chance of sleep. You can readily understand how, with no difference made between night and day,—without that alternation under which sleep comes as a habit,—your patient will either fall into that half-dreamy state which is of all conditions the most

unfavourable to the accession of a natural night's rest, or will lose all sleep, and therefore soon and necessarily pass into delirium or coma. Remember, then, to let your patient enjoy the alternations of day and night; do not darken his room too much in the day; if a direct exposure of the eyes to the light make him uncomfortable, you may permit the use of a light shade or blind, but do not shut out the light altogether; remember also to keep him as quiet as possible. Do not permit him to be disturbed every quarter or half hour, for the purpose of giving him drinks which he does not require. On this point it often appears as if common sense had left both the professional and other attendants, who in this way force upon the nutritive function a quantity of fluid, which, even in its healthy state, would be too much for it, and which in its impaired condition it is incapable of assimilating or absorbing. Let your patient be circumstanced, as regards light, air, attendance, &c., as much as possible like a patient in hospital; let him lie as nature dictates, quiet and undisturbed, and let the attendant remain at a distance from him. If the attendant sit even outside the door, so much the better. Remember, as I have so often said, that want of sleep is not a symptom but a part of the disease; and that if sleep be not procured, delirium, and then coma, and most probably death in the end, must ensue. If we now pass from the consideration of light, air, &c., to the question of medical treatment, the first thing to be done will be to have the head shaved; and this of itself is sometimes sufficient to induce sleep; the application of cold embrocations is useful and grateful,

but the employment of intense and long-continued cold is often injurious. I have seen sloughing of the integuments result from intense and long-continued cold. A single layer of thin old linen moistened with evaporating lotion, and laid upon the head, is generally all that is required; even in such application, simple as it appears, the mistake is constantly made of laying on the linen in three or four folds thick, the effect of which is, that the outside layer prevents evaporation, and the layer next the head soon becomes as hot as the head itself. The affusion of slightly tepid or cold water from the rose of a watering-pot upon the shaved head, several times in the course of the day, either alone, or in addition to the evaporating lotion, is often a most grateful and soothing application. If these means fail to procure sleep, apply four or six leeches to the temples. This is an anodyne upon which, for my own part, I place more reliance than almost upon any other. The result is often most gratifying. In some cases good sleep is at once procured, in others it is only obtained at short intervals the first night. The repetition of the leeches is made next day, and there is again rest; it is seldom necessary to repeat them more than the third time. There are so many instances in the wards, and of so frequent occurrence, illustrating the good effects of this treatment, that it is not necessary to particularize. May we use this local depletion with the object of procuring sleep when the pulse is not only not stronger, but weaker than natural? I am sure we not only may, but that we ought. There are few points of

practice in the treatment of fever in which I would venture to be so decided as the advantages of employing local depletion to restore sleep, the loss of which, if it continue, is of itself sufficient to kill. If even the shortest sleep be procured, some advantage is gained.

How leeching has the effect of procuring sleep, it is not easy to explain, and I dislike theorizing on a subject connected with practical medicine; but it may be supposed that when the brain has been excited, through the absence of sleep, for three or four nights in succession, it is first in a state of irritation, and then passes into a stage of congestion, just as an eye too much exposed to light, becomes first irritated, then congested; at all events, there would appear to be some congestive action of the vessels, which if you relieve by the application of a few leeches, you do much towards the recovery of your patient. A state of general debility, requiring the exhibition of wine, need not prevent your employing this remedy; for while you give wine with a view to the tone of the heart, larger vessels, and capillaries, you are perfectly justified in relieving the distended capillaries of the head by the local abstraction of a small quantity of blood; as in some forms of ophthalmia it is often the best practice to employ local bleeding to relieve the distended capillaries while exhibiting tonics, to give tone to the general circulation. I was first led to adopt this practice towards procuring sleep, chiefly from having observed some cases in which, on the occurrence of epistaxis, sleep supervened, and the patients recovered, although the general debility had been so great as to

have required a free exhibition of wine. Do not then wait for headach, intolerance of light, or delirium, as an indication for leeching, but employ it at once for want of sleep. You need have no fear of taking a small quantity of blood from the capillaries, for they very soon accommodate themselves to the trifling loss sustained: there is not the risk that might attend an equally small abstraction of blood from a vein.

When blood is taken suddenly from a vein, from the mass of fluid returning to the heart, as in general bleeding, the abstraction of even a small quantity is felt as a shock, and a consequent depression of the general circulation is at once produced, while much larger amounts may be lost from the capillary system without any such result. Examples of this in spontaneous hæmorrhages, and in local depletions, are of daily observation in other diseases.

The question will probably suggest itself to you here: as opium is given in delirium tremens, and in such like diseases, why should it not also be administered in fever, where obtaining sleep is a matter of such paramount importance? Why not give it for the lesion of the cerebro-spinal function which we are now considering? For this reason, that if opium be given in fever, and if it do not procure sleep, it does mischief of another kind. It will act injuriously upon the nutritive function, including secretion and excretion. In analyzing the disease before us, we may derive great assistance from comparing some of its lesions in function, with symptoms in other diseases. For instance, in delirium tremens, while the

tongue and gums are moist, and the secretion of urine is abundant, you may continue to give opium for the purpose of procuring sleep; but if, in the course of the treatment, the tongue become dry and brown in the centre, the urine high-coloured and scanty, and a slight wound or cut, if there happen to be one on any part of the body, become dry and evert its edges—in other words, if the nutritive function begin to pass into a deranged state, then the opium is acting as a poison upon the system, and the continuance of its administration would be fatal. The same considerations are to guide you in the exhibition of opium in fever; if the condition of the skin, of the mucous membrane, and an abundant secretion of urine, indicate a sufficiently active state of the nutritive and secreting function, perhaps you may venture on a trial of opium. I do not advise you to it; on the contrary, I would rather recommend you to abstain from it; and if the desired effect be not produced at once, do not attempt to press it; if you do, mischief will surely follow. There is, however, a form of fever that may be truly called nervous fever, in which the lesion is so nearly confined to the cerebro-spinal function, that the disease almost approaches delirium tremens in its symptoms. There is great prostration, feeble pulse, cool or perspiring skin, and moist tongue. In this variety, seldom seen in hospital practice, morphia alone, or combined with camphor, is a most applicable remedy. Hyoscyamus is a remedy which has not, like opium, an injurious effect upon the functions of nutrition and secretion; and which may, there-

fore, be exhibited as an anodyne in fever, without fear of injurious effects. The tincture is the preparation I am most frequently in the habit of prescribing. It must be given in large doses to obtain any useful result. If in a single dose at bed-time, there is little or no use in administering less than two drachms; if repeated, there should be a drachm in each dose.

I saw G. F., ætat. 19, on the 2nd September. It was on the ninth or tenth day of fever. He was covered with dark-coloured maculæ; the pulse was so quick and feeble as to require wine. His head had been shaved; he was delirious, and had been without a moment's sleep for two days and two nights. I prescribed for him three draughts, each containing one drachm of tincture of hyoscyamus, one to be taken every fourth hour until sleep came on. He took the first at 12 o'clock; the second at 4 o'clock; the third at 8 o'clock. Soon after having taken the third draught, he slept soundly for several hours; and on the third day afterwards was convalescent. This succession or combination of cold affusion or embrocation, leeching, and hyoscyamus, modified according to the intensity in each particular case, is applicable to the treatment of want of sleep, or to want of sleep and active delirium combined. There is another form of delirium which does not require any active treatment, when the patient raves, particularly to himself, while awake, but obtains a fair proportion of sleep. I think I have often observed that hyoscyamus differs from opium in not producing rest until next day, or until many hours have elapsed after its exhibition.

If coma approach, we cannot generally persist in leeching, but must then have recourse to blistering as a means of rousing the patient from the state of stupor. The blisters may be applied in succession to the nape of neck, forehead, and head. In the ordinary way of applying a cap blister, as it is called, the blister cannot be made to lie close to the surface; I have been in the habit of having the blister cut into strips of an inch in width, which are laid on across the head in a direction from ear to ear; thus no part is left uncovered, and the strips lie close to the skin. Counter-irritation may also be produced in a few hours by means of croton oil and ung. hydr. mixed in equal proportions, and rubbed into the scalp every hour until an eruption appears. There is a form of breathing preceding the approach of coma which you might confound with that of bronchitis, but which is very different; it is exceedingly rapid and laboured, amounting to forty or fifty respirations in a minute, but the respiratory murmur is audible in the tubes; there is no mechanical obstruction in them. This is what may be called cerebral respiration; while in that of bronchitis or catarrh, the tubes become filled with mucus, and a mechanical obstruction is thus presented to respiration, under which very few in any stage of fever recover. In the obstructed breathing of catarrh there soon supervenes the characteristic and fatal lividity of face, while in cerebral breathing, the countenance remains pale or natural, or becomes high-coloured. The cerebral breathing is often of a loudly blowing character, the patient lying on his back, with dilated *alæ nasi*, and deep and hurried action

of the respiratory muscles similar to that which we see in a healthy person immediately after violent exertion.

In Prunty's case, to which we shall have to refer again more particularly, the breathing became very rapid and laboured, but the face remained pale. It did not become congested or livid. The debility in this instance was very great. In conjunction with coma, I may notice subsultus. This may go no farther than a mere twitching of the muscles of the fingers and fore-arms, perhaps scarcely perceptible when feeling the pulse; or it may extend to the muscles of the arm, shoulder, muscles of the trunk, and muscles of the neck. The danger is to be considered as proportionate to its extent and intensity. On what pathological state of the cerebro-spinal system it depends, it is impossible in our present state of knowledge to determine. Of what structural alteration, if of any, it may be the effect, we do not know. Like convulsive affections in other diseases, it may be connected with a congested state of the cerebro-spinal system, or with a state of debility; or it may be a mere lesion of function, of which we know no more than that it is so. Its presence does not materially alter the principles of treatment already explained in reference to the cerebro-spinal system, nor the employment of those stimulant remedies to be afterwards noticed; and, therefore, we need not spend time with its consideration. In some cases, as in the following, subsultus would appear to have been connected with sub-membranous effusion on the brain and spinal cord.

G. B., ætat. 19, well-formed and muscular, was ad-

mitted into Hardwicke Hospital, October 1st, 1852. He then laboured under a slight attack of pneumonia of a low form. On recovering from this he had an attack of simple fever, which soon yielded to ordinary mild treatment. On the 5th November, relapse of fever set in with typhoid symptoms. On the 11th, he began to grow stupid and heavy. On the 13th, there was an incomplete crisis, both by urine and perspiration; the pulse again rising. On the 16th, subsultus appeared, which rapidly extended over the arms and muscles of the neck, the latter occasionally growing rigid. On the 18th, 19th, and 20th, the subsultus progressively diminished; but the debility became extreme, and he sank into a perfectly comatose state on the evening of the 20th, when he died at 10 o'clock, P. M.

Post-mortem.—The membranes of the brain appeared congested, and underneath the pia mater there was a considerable quantity of clear serous fluid; and from the spinal cavity a quantity of similar fluid ran out, amounting in all to probably eight or ten ounces.

It is scarcely necessary to observe, after the analysis we have made, that the natural crisis, or recovery of the cerebro-spinal system, is by sleep; and the duration of this is sometimes so long and so continued, as almost to excite alarm; the patient sometimes sleeping through nearly the whole of two days or more, and only awaking occasionally for a moment at a time to take some light food or drink. This natural sleep may be readily distinguished from the sleep of coma, by the perfect consciousness of the patient when roused, and by

his sleeping on his side ; while in the sleep of coma, the patient always lies on his back, if left to himself.

A very remarkable disturbance of this system occasionally occurs, accompanying crisis through another function. The patient, about the fourteenth or fifteenth day, suddenly becomes greatly agitated. He appears to possess an increased degree of muscular power ; frequently jumps out of bed ; lies down again for a moment's sleep ; raves, but is easily recalled to recollection for a moment ; and passes large quantities of urine often when he is out of bed ; and the urine, allowed to rest, deposits large quantities of lithates. The pulse is very rapid, and altogether, at first sight, the patient's symptoms appear greatly aggravated ; but this is the agitation of crisis, which may be known by the deposit from the urine, by the absence of coma, properly speaking, and by the hysteric character of the agitation. I have seen this accompaniment of crisis only in young persons.

LECTURE IV.

LESION OF FUNCTION OF NUTRITION, INCLUDING ASSIMILATION, SECRETION, AND EXCRETION.—ITS SYMPTOMS: LOSS OF APPETITE; LOSS OF THIRST.—ABDOMINAL EVACUATIONS, LITTLE INFORMATION FROM.—URINE: CHARACTERS OF.—BLOODY URINE.—URINE DEFICIENT IN SALTS AND UREA.—URINE ABOUNDING IN LITHATES, IN UREA, IN PHOSPHATES.—BLADDER, NECESSITY OF ATTENDING TO.

ADHERING to our analysis of fever into lesions of functions, we come now to the consideration of the lesion of the great elementary function of nutrition,—that important function, upon which both animal and vegetable vitality mainly depend. Its physiological importance is at once a key to its pathological influence. In speaking of this function, I include under it assimilation, secretion, and excretion.

What means have we of determining the existence and extent of lesion of this great function? The symptoms are sufficiently plain; in all degrees of continued fever, from synocha to typhus, there is loss of appetite, which at once tells us that there is an arrest of assimilation, or that assimilation is not required in consequence of there being an arrest of secretion or excretion, or of both combined. The loss of appetite for solid food is the

first step, then follows the loss of desire for fluid, which is but an aggravated degree of the same symptom. As observed in a former Lecture, we ask the patient is he thirsty, not as an idle question, but to ascertain the extent to which this function is suffering; and as the absence of thirst, or the turning away from drink, becomes more marked, so is this lesion of function increasing. With this disinclination for drink, we see invariably a dry tongue: showing that secretion, so important a part of the function of nutrition, is also arrested; and sordes upon the teeth and gums now take the place of the natural secretion. We consider the return of moisture upon the tongue a good symptom, and why?—because it is an indication of the return of the natural activity of the function of secretion; and in like manner we are to look upon a return of thirst, or a wish for drink, as an indication of return of healthy action in the function of assimilation. A patient in typhus fever may die, though the tongue be moist, because he may die without this function being very much involved; but where it is involved to a considerable degree, as evinced by want of thirst and dry tongue, there is corresponding aggravation of disease, and increase of danger.

Examination of intestinal evacuations, however requisite occasionally, in reference to any dreaded structural disease of mucous membrane, gives us little or no information as to the lesion of function we are now considering; but the characters which the urine presents in the progress of fever are of great importance, as indicating the state of the function of excretion.

These characters may be considered in regard to its quantity and its quality. Of the former we may at once dispose by observing, that a copious discharge of it is a favourable sign; its qualities will require a more lengthened notice, and to them I now beg to draw your attention.

For the proper examination of the qualities of the urine passed in a case of fever, it is necessary that, immediately on being passed, or drawn off by the catheter, it should be at once transferred, before cooling, to glass vessels, with caps of paper laid over them to exclude dust, and allowed to remain at rest until the next visit. You will be surprised how soon you will, almost from inspection alone, be able to detect some of the most important varieties.

The most unfavourable kind of urine is that which is seen occasionally accompanying the severest form of fever, described as congestive typhus, in which there is great depression of the function of circulation, with maculæ and petechiæ on the skin. The urine in such cases is dark-coloured, muddy, and without sediment properly so called, but occasionally showing a small quantity of a dark-coloured pasty deposit, such as is seen in the dark-coloured urine of hæmaturia after scarlatina; it is of low specific gravity; is small in quantity; and coagulates when heated, from the serum it contains. This kind of urine appears to indicate that the natural excretion is arrested, and that instead of it, a portion of the blood is exuded; the capillaries of the kidneys are in the same state as the capillaries of the skin, both allowing the constituents of the blood to escape, shown by pete-

chiæ on the skin, and by albumen and colouring matter of the blood in the urine.

The next variety of urine is that most generally presented during the progress of continued or maculated fever, before crisis by the function of nutrition has set in. I will contrast urine of this kind with urine indicating crisis, and you will see how very marked the distinction is.

— Donnelly is now in the sixteenth day of typhus fever; he lies on his back, and sleeps badly; the tongue is dry and brown, and mouth covered with sordes; abdomen soft; skin hot and dry, and pulse very quick, 152. The urine has been preserved for examination as already advised, and presents the following characters: on holding up the glass vessel between you and the light, the contained urine presents a light cloud floating in it, but no sediment. The cloud appears to be caused by the presence in the urine of scales of the epithelium of the urinary passages. The urine is slightly acid, is not albuminous, and is of a very low specific gravity, 1.011. This low specific gravity indicates a comparative absence of the salts and of urea. 1000 grains of urine at this specific gravity contain, according to Dr. Christison's Tables, only 25 grains, or 1-40th of solid matter; healthy urine containing nearly double the proportion. There is no crisis in this case. The characters of this urine, taken in connexion with the dry tongue, sordes on the teeth, and absence of thirst, show the existence of a lesion of excretion, an important branch of the great function of nutrition.

Contrast this with the next specimen of urine from a case in the same ward, going through crisis. The patient Hodgins is now lying on his side; he is maculated, but his tongue is moist, and on examining the urine it presents characters the very opposite to those presented by the case last examined. The specific gravity is 1.030, 1000 grains of it containing, according to the same Tables, 70 grains, or about 1-14th of solid matter, being very nearly three times the quantity contained in Donnelly's urine; there is not the cloud in it which you saw in the last, but it is muddy; observe particularly the quantity of urea contained in it. To obtain a deposit of nitrate of urea from healthy urine, it is generally necessary to evaporate it to one-half, and let it stand for some hours on a stratum of nitric acid; but in this case you observe that the nitric acid is scarcely added when masses of beautiful crystals of nitrate of urea are formed. What are we to infer from the characters exhibited in the urine of Hodgins, in which the specific gravity amounts to 1.030, and with the branny deposit which you see at the bottom of the vessel? We infer that the secreting function exists in an unusually active degree. But there is even more solid matter in this urine than that indicated by the specific gravity; for the branny deposit, consisting of lithate of ammonia, which lies in such quantity at the bottom of the glass, will re-dissolve on the application of moderate heat. You observe that on putting a portion of this urine from the bottom of the vessel most loaded with deposit into a test tube, and heating the

upper portion of the tube very moderately over the spirit lamp, the portion heated becomes quite clear, while the lower portion remains as before.

In heating urine containing the lithates, or to discover the presence of albumen, I would recommend you to do as I have done in these experiments,—heat only the upper half of the fluid, which you can effect by holding the test tube slightly sloping over the spirit lamp; the lower half of the fluid then remains unchanged, and you easily detect, by comparison, any alteration however slight. If the urine containing the lithates contain also albumen, which it sometimes does in small quantity, the urine on being heated first becomes clear from the solution of the lithates, and then opaque and milky from the coagulated albumen: so that the order of the appearances is: first, muddiness; then, clearness; then again, opacity. In some varieties of urine abounding in urea, on boiling the urine for even a short time there appears to be ammonia formed by the decomposition of the urea, and the urine becomes milky from the phosphates being set free, which at first sight present a resemblance to albumen. The usual test, however, of a drop of nitric acid determines the difference.

There is a very singular kind of critical urine which I have very seldom met with, but which, from what I have seen, indicates, in like manner as the lithates, a return of active secretion. It is pale when passed, and clear; on its resting for some hours, it remains still clear, but its surface, if it have not been disturbed, presents a well-marked pellicle on the surface.

On touching this with the finger, it breaks up as a very thin pellicle of ice would, and showers of minute, shining, diamond-like crystals of triple phosphate fall through the fluid. You now see what important information we obtain from the examination of the urine in fever. As long as the urine presents the appearances and characters described in Donnelly's case—high-coloured, cloudy, without deposit, and of low specific gravity,—so long, no matter what the other symptoms may be, will your patient be in an unsafe condition; for the function of nutrition must return to health in all its parts to make recovery perfect; while, on the other hand, if the characters described as belonging to critical urine show themselves, there is evidence of the function of secretion not only retaining its healthy state, but compensating by increased activity for its temporary interruption.

In some most unpromising cases of fever, when it has arrived at a stage and an intensity that seem almost to preclude hope, the cheering appearance of a copious deposit is seen, and recovery dates from it just as we had begun to despair.

The flow of critical urine in some of the forms as described, either loaded with urea, lithates, or phosphates, separately or combined, may continue for several days. The urine, which had been previously, perhaps, of a specific gravity of 1.010, and which had risen during crisis to, perhaps, 1.030, again falls back to a lower specific gravity, and gradually assumes the character of healthy urine.

The remissions which are occasionally seen in fever

are often well marked by the changes in the urine. The urine passed early in the morning being of high specific gravity, and loaded with lithates or urea, or both; and that passed in the evening being cloudy, high-coloured, and without deposit, and thus the crisis may go on for several days.

In these observations I have made upon the urine, I have purposely avoided going into any minute chemical or microscopical examination, merely using those tests that are of easy application in the ordinary routine of practice.

We should now, perhaps, in order, proceed to consider the treatment adapted to meet the lesion of the function of nutrition, which would naturally include the treatment of the digestive organs; but some observations on the necessity of attention to the state of the bladder will most appropriately fall in here. I cannot too earnestly impress on you the necessity of closely watching the condition of the bladder. Murphy's case afforded a good illustration in point. He was very ill in maculated fever, so violent that it was necessary to put a strait waistcoat on him. His delirium was furious; his tongue dry and brown; his pulse above 130, and skin covered with both maculæ and petechiæ; he had not slept, and his eyes were suffused; he passed fæces in bed, and we were positively assured by the nurse that he had also passed urine copiously under him. This statement seemed confirmed at first sight on turning back the bed-clothes, for there was a strong urinous smell from him; the sheets were wet, and the urine was seen welling from the orifice

of the urethra, and dribbling over the thigh. Notwithstanding all this, I introduced the catheter, and there passed off more than two quarts of urine. You know what the effect on the brain and system would have been had the bladder been allowed to remain in this state. It is scarcely possible to suppose anything more calculated to extinguish life in fever than the bladder continuing in such a state. Remember what you saw in Murphy's case—that urine flowing out upon the sheets may be only the surplus which no longer finds room in the bladder.

I saw not long since, in private practice, another case illustrating the same point. In this case the patient was a lady under the care of a homœopath. You know a homœopath would not use a catheter. It was on the fifteenth or sixteenth day of fever. I found her in epileptic convulsions, which had continued for some hours, foaming at the mouth, insensible, unable to swallow, and, to all appearance, dying. On examining the abdomen, I felt the bladder extending as high up as the umbilicus. On introducing the catheter it was scarcely possible to bear the intolerable ammoniacal smell of the urine, which must have been shut up for several days. It continued to flow until some large basinfuls were drawn off. This patient recovered, but she suffered much for the neglect. Subacute and then chronic cystitis followed, under which she continued to suffer for more than a year afterwards. Never trust to a nurse's report of the patient's having passed a sufficiency of urine. Examine for yourselves, both by percussion and by manipu-

lation. I cannot advise you to be content in some cases with any test of the bladders being empty except the introduction of the catheter. Of the two tests of manipulation and percussion, the latter is more to be depended upon than the former. If the bladder have lost its tone,—if the patient be short and full,—and particularly, if there be lessened sensibility, or coma,—the hypogastric region will sometimes feel soft and yielding, even though the bladder contain a large quantity of urine. In short, so strongly do I feel the necessity of attention to the condition of the bladder, that I should advise you, in every case in which there can be the least doubt, to trust neither to the report of the nurse, nor to the appearance of the sheets, nor even to examination of the hypogastric region, but to depend alone on the introduction of the catheter. Its introduction can be only necessary in states in which it will not be felt as an annoyance by the patient. If you find urine which could not otherwise be expelled, you have probably saved life; and if you have not found urine, the introduction of the instrument has not caused any detriment.

LECTURE V.

LESION OF FUNCTION OF NUTRITION CONTINUED.—RULES AS TO NUTRIMENT.—REMEDIES TO BE EMPLOYED: MERCURY; DIURETICS; PURGATIVES.—TYMPANITES.—DIARRHŒA.—PERSPIRATION: CRISIS BY.—DANGER OF.

WE now naturally proceed to consider what are the principles and details of our treatment in reference to the lesion of the function of nutrition, so important an element in the production and continuance of fever. Under this head will properly fall the treatment of the digestive organs and of the skin, as the functions which these organs fulfil may be considered as constituting essential parts of the great function of nutrition.

The arrest of the function of assimilation in fever,—evidenced by loss of appetite for solids, and, as the disease progresses, by want of desire even for fluids,—we are to look upon, not as the primary functional derangement, but as consequent on the arrest of the function of secretion and excretion. That such is the order of the arrest of these component parts of the great function of nutrition, is, I think, shown in the circumstance of emaciation not forming a symptom of the early stages of fever, even though for many days nutriment is refused. This view is also, I think, borne out by what occurs at the time of crisis, when the first symptom of recovery is increased

activity of some secretion, consequent upon which follows, first, desire for fluid, and then appetite for solid food; and in the passage through this crisis, emaciation, from the increased activity of secretion and excretion, becomes suddenly more marked than through the previous interval of many days.

This consideration of the order in which the component lesions of the functions of nutrition follow one another, is not an idle inquiry; for if this view of their order of succession be correct, it indicates to us that we must follow the same order in our treatment, and that instead of pressing nutriment upon organs which instinctively refuse it, our first object should be to excite the functions of secretion and excretion. These returning to their natural activity, the desire for nutriment will speedily follow to supply the waste. If this consideration had its due weight, we should not see mischief so often resulting from the injudicious administration of nutriment. Melted jellies, broths, and farinaceous liquids in every form, are, I fear, too often administered in undue quantities, in disregard of the instinctive reluctance on the part of the patient, and in forgetfulness of the physiological consideration, that were the organs of assimilation calling for a supply, there would be an instinctive desire for the nutriment. The quantity of nutriment which is sometimes exhibited, and its frequent repetitions through day and night, are often more than sufficient to overpower a stomach in its healthiest tone; we can then readily conceive how injurious must be the effects in a system in which there is little or no assimilation.

lation of food going on, and how the presence of so much undigested nutriment may give rise to hiccup, diarrhœa, and tympanites.

In respect to the management of the function of nutrition, as well as of the cerebro-spinal system, the hospital patient has the advantage : he is not subjected to the mistaken kindness of relatives pressing nutriment upon a system not calling for it ; and hence one of the reasons, I believe, for more seldom seeing those serious symptoms of derangement of the digestive organs in hospital than in private practice. What is then to be our rule with regard to nutriment and drink ? Simply this, as long as the patient is conscious, force no nutriment upon him. If he turn away from any other drink than cold water or whey, press no other on him ; and when the arrest of function reaches to such a degree that even thirst is gone, let not drink in quantity be pressed. Even when a patient is so far unconscious that he can with great difficulty understand you, or will not protrude his tongue, the manner in which he will take nutriment from the feeding cup will tell you whether the instinct for it has returned. In short the rule should be to supply nutriment as it is wanted, but never to press it when there is not the demand for it. There is no phenomenon in the progress of fever, perhaps, so striking as the contrasts that the function of nutrition presents at different times. The stomach turns with loathing from the smallest quantity even of fluid nutriment. But crisis takes place in this function. The kidneys particularly tell us of the sudden restoration to great activity of secretion ; and now the stomach

instinctively calls at short intervals for nutriment, which is freely taken and rapidly assimilated, to meet the renewed activity of secretion and excretion.

Let us now proceed to consider what are the remedies with which we may hope to effect or aid a restoration of secretion and excretion, and consequent restoration of the whole compound function of nutrition. I believe that of these, mercury holds the first place as an alterative, and that in fever with dry tongue, absence of thirst, and urine cloudy and of low specific gravity, we can never err in giving mercury in small doses. We give it, because of all medicines it is that which appears, under almost all circumstances, to have the most certain power of restoring to health the elementary function of nutrition; we see its power in effecting this in local lesions of nutrition, and we only extend its application in recommending its exhibition to meet the general lesion of this function in fever. In administering mercury with this indication, you will, however, recollect that it is only as an alterative to correct a lesion of function we are prescribing it, and that it is to be given in very small doses, and in its mildest preparations. Two grains of hydr. cum creta, or one of blue pill, every fourth hour, will be sufficient,—it must not be pushed to salivation. When once the tongue has become moist, and the desire for drink has returned, there is nothing more to be gained by its exhibition.* In administering it, the

* I may observe here, that I believe the early exhibition of mercury in scarlatina anginosa will be found the surest preventive of that diffuse inflammation of the neck which forms so fatal a complication of the disease. Mer-

most careful attention must be paid to the digestive organs; and if any of the usual irritative effects of mercury appear, its use must of course be at once discontinued.

These observations as to the employment of mercury are intended to apply to the treatment of ordinary maculated fever of moderate intensity: we could expect nothing from mercury in that intense form of typhus which I have described as congestive typhus, in which the function of circulation is almost suddenly struck down, and where death takes place from another and more rapid lesion than that of the function of nutrition. With the same view and on the same principles, diuretics are advantageously combined with mercurials; and of these the ordinary diuretic, nitrate of potass, in small doses, combined with carbonate of potass, is, I believe, one of the best.

Purgatives come next under our observation, as a class of remedies which apparently ought to be expected to have power in restoring the function of nutrition to a healthy state, but they do not fulfil our expectations; on the contrary, many of the worst cases of fever we meet, owe their aggravations to excessive purging in the commencement, which is so often employed by the patients themselves, in the vain expectation (to use their own words) of cutting short their sickness.

Active purgatives do not appear to excite a healthy cury will not cure it; but I have so strong a conviction of its preventive powers, that when an epidemic of scarlatina prevails, with a tendency to this diffuse inflammation, I invariably recommend that the patient should be at once put under the influence of small, but frequently repeated, doses of a mild mercurial.

secretion or excretion, but the effect is seen in the production of great irritation along the whole intestinal tract, giving rise to debility, diarrhœa, or rapid secretion of gas, and consequent tympanites, with the secondary effect of the latter in pressing upon and impeding the action of the diaphragm.

We use purgatives very sparingly indeed. Among the complications of fever there are few to be dreaded more than a tympanitic state of the intestinal canal. Even without fever, as a mere local disease of function, distention with want of tone of the intestines, as in one form of ileus, is sufficient to cause death. What then must be its danger in a system with, not one, but every vital function depressed to its lowest ebb? We ought to estimate the value of any particular treatment in fever not alone by the symptoms it may successfully combat, but by the risks it may prevent; and if, by adopting a particular line of treatment, the occurrence of a dangerous complication is prevented, that treatment, although it may be called negative, recommends itself far more strongly than one which would permit the danger to arise, and then turn to combat it.

It is seldom necessary to administer aperients; the bowels are generally spontaneously moved once or twice a day. If this should not occur, or if the intestines seem to be loaded, a mild carminative aperient, occasionally administered, will be sufficient. Daily or continued purging will always be injurious. A lavement in the evening is often most beneficial in relieving any feeling of distention from air or more solid contents in the colon,



and thus removing one of the impediments to sleep. The objection that would apply to the frequent use of aperients does not apply to enemata: if they cause irritation, they are expelled without extending a continued irritation over a large surface.

If tympanites occur, it will be often successfully checked in its commencement by friction with the hand, alone or with some stimulating liniment over the abdomen two or three times in the day; if it become, however, serious, particularly in that form of fever which is accompanied with much general muscular prostration, in which the patient, perhaps half muttering, lies on his back, I would strongly recommend the administration of a large dose of oil of turpentine, of which not less than from two drachms to half an ounce should be given, combined with two drachms of *ol. ricini*.

I think it is better to give the turpentine thus than to administer it in frequently repeated small doses every third or fourth hour. I do not think it is so efficacious in the latter form; and I think it has sometimes, in those frequently-repeated small doses, acted most injuriously on the kidneys, causing bloody urine, and diminishing the quantity. Blistering is of great use in checking tympanites; but in blistering, do not cover the whole abdomen at once. Blister in patches, so as to leave room for successive applications if required.

If diarrhœa be not excessive, do not meddle with it. Look upon it when occurring without the administration of active purgatives in the same light as you would look upon a copious and increased discharge of urine. Let me

particularly warn you against the use of opiate enemata. All that has been said of opium given by the mouth in a former Lecture applies equally to opium given in enema. It may injuriously affect the functions of secretion and excretion; and it may, moreover, greatly increase the tendency to coma, which is so common a lesion in typhus. I will not say that an opiate enema ought never to be administered; but great caution ought to be exercised in its employment, and it should be used only when we are driven to it as a last resource. It will be better practice to keep the diarrhœa within bounds rather by allaying irritation, and withholding medicine or any article of drink or nutriment that may appear to excite it, than by attempting to check it by astringents of any kind. We can seldom safely venture beyond chalk mixture, or some remedy equally mild. Diarrhœa is seldom a troublesome symptom in pure typhus.

Perspiration, as indicating a renewal of secretion, might, *a priori*, be considered as a favourable crisis; but so far is this from being the case, that a crisis by perspiration is of all forms that which is most to be dreaded in maculated fever. I cannot explain this, but of the fact I have no doubt. If after eight or ten days a copious perspiration come on, and that the strength shows the slightest tendency to sink under it; or if the pulse rise in frequency and lessen in force while the perspiration is coming out, the termination will most often be fatal. In fact, recovery under such circumstances constitutes the exception. I have such a dread of crisis by perspiration, that I would much rather see a case of maculated fever

considerably prolonged, than that the risk of crisis by perspiration should be incurred. In this respect, as in some others previously noticed, the hospital patient has the advantage; for in private life, from feather beds, warm drinks, and heavier coverings, there is a greater tendency to perspiration, than in the light-covered beds and cool air of hospital wards. In our general management, everything that could encourage perspiration is to be avoided. If a feather bed be used, it should be of the lightest description; and if a flannel vest, as will sometimes happen, has been habitually worn by the patient in bed, let it be at once removed. It will sometimes require most peremptory direction on the part of the physician to carry out these regulations. Popular knowledge, or rather ignorance, confounds maculated or typhus fever with synocha, or short inflammatory fever; but the copious perspiration that will cure in the latter will kill in the former.

LECTURE VI.

LESION OF FUNCTION OF CIRCULATION : CASE OF DEATH FROM.—CAPILLARY SYSTEM TO BE VIEWED AS A WHOLE.—SIGNS DRAWN FROM COLOUR OF MACULÆ.—WINE : RULES FOR ITS ADMINISTRATION.—AMMONIA.—TOLERANCE OF WINE.—FLYING BLISTERS.—SINAPISMS.—MACULÆ AND PETECHIÆ, DIAGNOSIS OF.

WE now approach the consideration of lesion of the function of circulation,—the lesion most to be dreaded, if we estimate the danger by the rapidity of sinking when this function is prostrated. The cerebro-spinal system may have nearly all its functions arrested for even many days, as we see in the coma of fever, and in apoplexy ; and the function of nutrition in all its parts may, in like manner, be interrupted with recovery still to be expected ; but it is not so with the function of circulation. If, under functional lesion, circulation sink to a very low ebb, or is totally arrested, recovery becomes almost impossible, or death must quickly result. Hence we see that the most rapid and terrible forms of typhus are those in which the lesion of this function is the prominent lesion. The cases already detailed in our first Lecture are sufficient evidence of this. In some cases this function will sink within four days from the commencement of the attack ; in others the time will be more ex-

tended, according to the degree to which the function is lowered, or the rapidity with which the depression proceeds ; a patient may die of lesion of the function of circulation almost alone. We may see a patient in typhus fever obtaining sleep, taking nourishment—with abdomen soft, bowels free, kidneys acting, and intellect preserved, until almost the closing hour of life, and yet we see him dying ; and on analyzing all the vital functions, we find that he is sinking from failure of this primary function ; and beyond this, in our observation of the case, we cannot go. You will hence understand the importance of carefully attending to the state of this function.

We generally see the most formidable cases of typhus, with sinking of this function, in persons after the age of forty ; but no age is, perhaps, exempt.

I have already noted some cases in our first Lecture, in which death was caused by lesion of this function. I shall add one more to fix its nature more firmly on your minds.

Mary Redmond, æt. 35, admitted into the Hardwicke Fever Hospital on the 16th February, twelve days ill. She had enjoyed excellent health until twelve days ago, when she was seized with rigors, which continued two or three days, succeeded by pains wandering through her whole frame. These were succeeded by slight headach, with hot skin and laboured respiration. Her friends, finding her gradually sinking, although complaining of little or nothing, brought her into hospital. She lay on her back, apparently not suffering, but very much debilitated ; her countenance calm, though sunken ; her

senses seemed dull, but she was quite rational when roused ; respiration was not laborious, although rapid—about 38 in the minute ; the action of the heart was weak ; pulse 140, weak and compressible ; extremities inclined to be cold. The skin of the trunk of the body is dry, the whole surface thickly covered with maculæ and petechiæ of a very dark colour. The tongue is moist, with a yellowish exudation on it ; the abdomen is soft, not tympanitic ; and watery stools are passed involuntarily. She was ordered ten ounces of brandy, mist. camph. c. carbonate ammoniæ, flying blisters over chest and abdomen, and sinapisms of mustard to calves of legs.

18th. She continued to sink ; maculæ and petechiæ increased in number and darkness ; brandy, twelve ounces.

21st. She continued to sink, and died on this day, (mucous rattle having supervened over the chest,) the seventeenth day of her illness, including the duration of the rigors.

Post-mortem.—There was effusion of mucus into the bronchi, but with the exception of this, not the slightest trace of disease could be discovered in any of the viscera. The whole tract of the intestinal tube was most carefully examined. The urine found in the bladder was coagulable, muddy, and dull-coloured ; sp. gr. 1012.

Let us consider the state of the function of circulation in this case. The pulse weak and compressible, indicating lessened energy of the heart ; the skin covered with maculæ and petechiæ of a dark colour ; the heart's action continuing to grow feeble, and the maculæ and

petechiæ to increase in number and darkness until death took place. Her death was the result of lesion of the function of circulation. The failure of power in the capillary system in such cases is sufficiently obvious.

If the patient remain for even half an hour in the one posture, what is the result? The parts lain upon become congested and dark in colour, dark in proportion as the circulation becomes more and more sluggish; and finally, if not relieved, the dark part of the skin pressed on would become—and, indeed, does become very often—gangrenous; or, in other words, the circulation ceases in it; the vessels become incapable of carrying it on or restoring it, and death or gangrene is the result. We do not see such lesions take place in the capillary system in other diseases, in which the patient will often lie longer than in fever; nor do we see them in cases of fracture, where the patient is often obliged to lie in one posture for weeks together. We have in all these facts proofs, then, of an extremely debilitated state of the capillary system of circulation. We can judge of the slowness or want of energy in circulation by the depth of dark shade of the blood in the part. We find in typhus fever that the danger of the case is, *ceteris paribus*, in proportion to the darkness of the maculæ—in other words, to the deficiency of energy in the capillary system; and in this we have additional proof of the state of this system in the form of fever now before us. Let us proceed with our examination. We find the conjunctiva of the eye in such cases deeply congested, the vessels tinged of a dark red, and in great numbers running over the con-

conjunctiva. If we pass now to the urine, we find frequently in such cases that it is of a muddy, dark hue, and, when heated, showing albumen in it. It appears as if the blood had escaped from the vessels of the kidney, just as it escapes from the capillaries of the skin to form petechiæ.

Now, instead of considering this state of the capillary system in the skin and conjunctiva as a mere symptom, or as a mere local affection, let us look upon the capillary system as a whole throughout the body; and let us reflect, as we find it in one part, so is it in all, whether in external or internal tissue; and we shall then, I believe, have a correct idea of its condition, and of the importance of attending to it.

The lesion of the capillary system we have to combat is, therefore, a lesion, not of a particular organ or structure, but of a function universally diffused through the living being; and if we suppose this lesion of function general, extending through every organ, we can easily comprehend how injurious must be its effects, and how depressing its influence. Let us, then, as we stand at the bed-side of a patient in typhus fever, recollect that in looking at maculæ or petechiæ, or examining the distended vessels of the conjunctivæ, we are observing, not a mere local derangement, but that we are studying in these external indications the state generally of the circulatory system as a whole. In this view we can understand why we attach importance to the colour of the maculæ; why we look upon rose-coloured maculæ as a good sign, and dark-coloured maculæ as indications of

danger; and petechiæ, or effusions of blood from the capillaries, as signs of still more imminent danger. The dark-coloured maculæ are indications of danger, because their colour is owing, we know, to an enfeebled circulation. The darker the maculæ, the feebler is the capillary circulation; while the more energetic is the capillary circulation, the more vivid will be the colour of the blood passing through it. In this view we can also find an explanation of the fact, that a patient may have an intellect not disturbed, may have a cool skin, a clean tongue, a soft abdomen, a pulse not above 70 or 80, with volition and sensibility, little disturbed almost up to the last moments, and yet die of typhus fever in seven or eight days. Of what does the patient die, in such a case? He dies of this lesion of the function of circulation. In most cases this lesion is not the only one present, although often the most prominent; but I wish to fix attention on it in this analytic view of fever, as it leads to a practical rule for the administration of one of our most important agents in the treatment of fever, viz., wine. You are too often bewildered in the directions as to its employment. You are told to beware of delirium in its administration, and yet, again, you read that delirium subsides under its use. You read instructions either to refrain from its use when the tongue is dry, or to judge of the propriety of continuing its exhibition by its effects on the tongue. Instead of attempting to reconcile contradictory statements, and even sometimes unintelligible directions in its administration, turn from books to the living book—the case before you—and read from it. Ask yourself for what is

it in typhus fever you prescribed wine? Is it for delirium? No. Is it to prevent its approach? Again, no. Do you give it for a dry tongue? Certainly not. What is it that, as you consider a patient's state, would lead you to think of its employment? Is it not the state of the function of circulation, taken as a whole, indexed to you by the pulse, on the one hand, and by the state of the capillary system of circulation in the skin, on the other.

It is for this you give it. It is the specific remedy directed to remedy the general lesion of the function of circulation, and hence in its administration you may give it whether there is or there is not delirium; for delirium may be present or absent in a case requiring its exhibition for the function of circulation. You should give it indifferently, whether the tongue is moist or dry; for the tongue may be either, and yet wine may be required; and hence the tongue's becoming moist is not an indication that you may dispense with its use, nor is its continuing dry a sign to make you discontinue it. You may give it with a soft abdomen, or with an abdomen tympanitic, for similar reasons. You are giving wine, recollect, as the specific remedy for the lesion of the function of circulation (remember always comprising under this the capillary and cardiac circulation); and by the state of pulse, and changes in the colour of the maculæ, you are to judge of the necessity of continuing, decreasing, or augmenting its dose. Under its exhibition, you will see the vessels of the conjunctivæ contract, the maculæ become rose-coloured, and the patches of skin on dependent portions of the body lose their dark livid hue.

Keep this then in mind,—the lesion in fever for which you give wine is the lesion of circulation; and if this function from debility require it, you must give it under all circumstances of derangement of other functions. Of the quantity required, it is quite impossible to lay down any rule. No two cases will have exactly the same amount of depression of circulating energy; no two cases will require precisely the same amount of wine. In some cases, four to six ounces are enough for a few days in succession to restore the circulation to sufficient tone; while there may be occasionally cases requiring as much as one ounce of wine every hour, or twenty-four ounces in twenty-four hours; and even in addition some ounces of brandy; and all this barely sufficient to preserve the circulation from sinking. When a case arrives at that stage in which the exhibition of wine or brandy in considerable quantity may be required, let me give you one caution:—do not confide its administration, with vague directions as to quantity, to an ignorant nurse, or to over-anxious friends. I have seen wine given under such circumstances in most mischievous excess, fatal coma being the result. If it be impossible to command the attention of a person capable of judging of the quantity to be administered, let the quantity to be given and the intervals be definitely laid down. Cases will occasionally occur in which the circulation appears so doubtfully in the balance, that the question of administering wine becomes one of great anxiety. In such cases I would venture to lay it down as a rule,—if the patient be young, withhold the wine—a day's delay will do little

harm, as young persons seldom die in fever from failure of circulation: but, if the patient be of middle or advanced age, be a day in advance with it, for in such patients, if the circulation once give way, it is often impossible to excite it to rally.

We must never abandon a case of fever as long as there is life; we must remember what the post-mortem of the case of Redmond and of other cases tells us,—that there is no structural disease; that the patient, even in the dying moment, is often sinking from a mere lesion of function, and that even then recovery is not hopeless; and we must recollect what clinical observation of several cases even now under our observation in the hospital shows us,—that the patient, one day in a state seemingly moribund, may on next day, or within twenty-four hours, be out of danger. It will not unfrequently happen, that even the power of swallowing is lost for several hours; that a small portion of brandy or wine can only be got down by raising the patient in bed, throwing spoonfuls of brandy into the pharynx, and then holding up the patient's head until it descends to the stomach, apparently almost by its gravity. Even thus it sometimes cannot be passed along to the stomach, but even then we can stimulate the circulating system by injections; and in some cases which you have seen, I believe the preservation of life has been owing to ether, given in the form of injection every two hours, in quantities of two drachms, until under its stimulating effect the circulation gained some vigour, and the power of swallowing returned.

The observations upon wine apply equally to carbonate of ammonia, which is, I believe, our most valuable medicinal stimulant. The indications for its administration are the same as for wine. It cannot generally be given in doses of more than five grains every three hours, as in larger doses, or more frequently repeated, it is likely to excite vomiting. There comes suddenly in the crisis of fever a very curious contrast in the tolerance of wine. The patients that have taken freely to the amount of, perhaps, twenty-four ounces within the day will, after crisis has taken place, not bear, perhaps, four ounces. This must be borne in mind; for if wine be unnecessarily continued after crisis, its effects are injurious. There often seems to exist an instinct in this respect. The patient drinks freely of wine, almost to any amount, until crisis has taken place, and then suddenly loathes it. This you saw exemplified in the case of Shine, under treatment while these Lectures are in progress of delivery. He was admitted into hospital on the 26th November, 1852; he required wine from his first day in hospital. He drank wine freely to the amount of about sixteen ounces each day; in one day twenty-four ounces; until about December 4th, when crisis took place. He then, although still very weak, turned with disgust from wine, but took beef-tea with great avidity, and the wine was suddenly brought down to four ounces. The two principal ill effects of continuing wine after crisis are: first, its effects upon the digestive organs, spoiling the appetite, and drying the tongue; and, secondly, a singular effect, but very injurious, which it sometimes pro-

duces upon the nervous system; the patient becoming quite unable to sleep, and merging into a state resembling hysteria, or sometimes approaching even delirium tremens. There is, then, a mingled feeling of wakefulness and nervousness, which is very distressing. If this state supervene, take the patient altogether off wine, and substitute for it good beef-tea, or chicken-broth in full allowance, with an anodyne of five grains of camphor, with a drachm of tincture of hyoscyamus, and the unpleasant symptoms will generally disappear.

With the same object for which wine is given, viz., the object of stimulating principally the capillary system of circulation, blisters are applied in succession over the surface. The nurse is supplied with four or six small blisters; one after another is applied at intervals of six hours between them, over chest, abdomen, thighs, and legs. They are thus applied, it is to be remembered, not as counter-irritants, or as derivatives to act on internal structural diseases, but as stimulants to excite the capillary system. An action produced in any part of this system will be conveyed through the whole, and thus the action may be expected to extend its influence and to coincide with and assist the action of the internal stimulants of wine, ammonia, or brandy. The application of sinapisms is to be conducted with the same view and on the same principles; it is from this repeated application, at short intervals, the desired effects in maintaining the function of circulation are to be obtained.

In the preceding observations I have frequently used the terms *maculæ* and *petechiæ*. By *maculæ* and *pete-*

chiæ, I equally understand stigmata, not elevated above the surface, but differing in this respect, that maculæ are stigmata arising from simple congestion of little disks of capillaries, those capillaries still retaining the blood within them, and carrying on a circulation, while petechiæ are stigmata formed by dots of effused or stagnant blood. The two are easily distinguished. Press the stigma with the tip of your finger; if it be a petechia it will not disappear, for it is a dot of stagnant or effused blood, and cannot be made to move on by pressure. If it be a macula, it is merely a little disk of congested capillaries, and the pressure of the finger will make the colour disappear momentarily by emptying the vessels, to return, however, in a moment after the pressure is withdrawn.

The maculæ of fever will sometimes present a very strong resemblance to the eruption of measles. The peculiar crescentic dottings which belong to the stigmata of measles are sometimes absent in this exanthema, and then the diagnosis is still more obscured. There is, however, in addition to other diagnostic signs, this distinction—measles appear on the face, the stigmata of fever never do. The peculiar eruption that accompanies follicular enteritis does appear on the face occasionally; but this must not be confounded with the true maculæ of typhus. These latter I have never yet seen on the face.

LECTURE VII.

LESION OF RESPIRATORY FUNCTION.—TWO SOURCES OF THIS LESION. — PULMONIC DERANGEMENT. — NERVOUS DERANGEMENT.—SYMPTOMS AND SIGNS OF PULMONIC DERANGEMENT.—FIBRINOUS DEPOSITS IN HEART: TREATMENT.—SYMPTOMS OF NERVOUS DERANGEMENT OF RESPIRATION.—TREATMENT.

SOME observations on lesion of the respiratory functions will naturally follow in this place. In watching the state of the organs of respiration in fever, recollect there are two sources of derangement: the first arising from the state of the lungs themselves; the second, from the influence of the nervous system. The lesion of respiratory function may appear to be equally great in degree, arising from either cause; but there is a wide difference as to the actual amount of danger in the two forms. Two patients in an advanced stage of fever both appear to be breathing with great labour; in both the respirations may be as rapid as sixty in the minute; yet there will be a far greater amount of danger in one case than in the other. We shall, for the sake of distinction, designate the first, pulmonic derangement; the second, nervous derangement. The distinction between them is well marked. In both the respirations may be equally rapid; but in

the pulmonic derangement there quickly supervenes a congested face, or hue of lips, that plainly tells there is a congested state of the vessels of the lungs, and a defective aëration of the blood; and to these symptoms is sometimes added, but not often, expectoration tinged with blood. On examination with the stethoscope, mucous and crepitating rattle will be found over the depending portions of the lungs. As this form goes on, and its progress is sometimes very rapid, destroying life within a few hours from its commencement, effusion takes place into the bronchial tubes; the countenance becomes distressed, the lips blueish; and the mucous rattle extends over the chest, and becomes even audible at the bed-side. The patient's muscular strength is so much reduced that he is not able to unload the bronchial tubes of the accumulating mucus, and death soon supervenes. On a post-mortem examination, the bronchial tubes are found more or less full of mucus; and the depending portions of the lungs are congested and dark-coloured, resembling lung in the first stage of ordinary pneumonia, but differing in this respect, that while in ordinary pneumonia the characters of the morbid alteration seem to depend on effusion into the air vesicles, proportionately with congestion,—the lung in this lesion of which we now speak is much darker and tougher, more like carnified lung, and seems to owe its altered character more to mere congestion in the capillaries, and less to effusion into the vesicles, than in ordinary pneumonia.

The morbid change in the more severe form of this congestion is not confined to the lungs, but extends to

the blood itself, which appears to have coagulated even during life, thus presenting an obstacle to circulation which must prove fatal.

Anne Rock, ætat. 68, was admitted into Hardwicke Hospital, upon the 20th November, 1851, four days ill. She had previously taken salts, which purged her violently. On admission, her countenance looked dark and sunken; the skin was dry and hot, and spotted with dark-coloured maculæ; tongue, dry and brown; pulse, 108; very weak and intermittent. She lay on her back, making no complaint; and when questioned, answered intelligently. She had little thirst, and swallowed without difficulty; respiration was rapid and laborious, and bronchial rales were audible over the whole chest. On the sixth day of her illness, the maculæ were still more extensive and dark-coloured, and the pulse was 116, weak and intermittent; the respiration 40 in the minute. She lay as before, and was quite collected. On the seventh day, the pulse was 120; the respiration 48 in the minute; hands, cold; tongue, dry and brown, covered with sordes. She began to mutter to herself, but was sensible when roused.

On the eighth day the pulse was 120; very weak; the hands and arms were cold, and dark purple spots of congestion appeared on her elbows, knees, and ankles, the maculæ enlarged in size, and were dark and ill-defined. She continued to sink, and died at eight o'clock next evening,—ninth day.

Post-mortem.—The surface of the body was of a dusky yellow colour; but where a blister had been ap-

plied it was of a dark purple. The lungs were greatly congested posteriorly, and there was effusion into the bronchial tubes. Upon cutting into the right ventricle of the heart, it appeared to be distended with a quantity of black clotted blood. Upon turning this aside, a yellow fibrinous deposit was found firmly attached on all sides in the interstices of the inner walls of the ventricle, and extending from the ventricle continuously into the pulmonary artery, and its branches to the third and fourth subdivisions. This fibrous deposit was tough, elastic, and consistent, not more than half filling the caliber of the tubes through which it lay. Where this fibrinous formation, which was rather globular in the ventricle, passed through the neck of the pulmonary artery, it suddenly became constricted, and again swelled out in size in the trunk of the artery beyond the valves. The left cavities of the heart were full of black blood, but without any such fibrinous deposit as that on the right side. The other viscera were sound.

In this case, it is obvious there were two stages of coagulation—the one, that forming the dark-coloured clotted mass of blood which occurred immediately at or after death, and which presented nothing remarkable; but the other coagulation, I think it is obvious, existed for some time, how long, it is difficult to say, but, probably, for one or two days before death. The extreme toughened consistence, and freedom from colouring matter of the fibrinous deposit, would render this probable; but this probability is greatly strengthened by the neck-like form of the fibrine where it crossed the

valves into the neck of the artery, and which can only be accounted for by admitting, that while the polypus was in process of formation, the valves were in action, and for a sufficient length of time to produce the constriction described. Supposing this to have been the state, we can understand what a formidable aggravation such a formation must have been, and how the case must have sunk from the lesion of circulation with little comparative disturbance of any other function. The affection of the respiratory organs we are now noticing is very formidable from its very commencement, and from its last stage a patient scarcely ever recovers; hence, watch its approach, and most carefully examine the chest on the supervention of the slightest cough, to detect the earliest onset of congestion or effusion. You may check it in its commencement, or even in mid-stage. In the last stage, the case is almost hopeless. The stethoscope will, of course, materially aid us in our investigation; but it may lead us into serious error if we do not, in using it in fever above all diseases, remember clearly what is the real value of the physical signs which it reveals to us. Recollect, then—bear it well in mind—that auscultation tells us nothing whatever of the vital state of the vessels of the lung we are examining. It tells us there is crepitating rattle, or mucous rattle or sibilus in the lung, but it tells us nothing more. It tells us that the physical conditions which give rise to these sounds exist, viz., effusion into the smaller or larger tubes, or congestion of the lining membrane; but goes not one step beyond this. It tells us nothing as to the vital

state of the vessels which produced the effusion or congestion, and gives us no information as to whether the congestion is active or passive, or whether the existing congestion is to be met by stimulants or by depletion. For that information we must go a step beyond physical signs ; we must go to symptoms ; we must question the pulse, heat of the skin, and colour of maculæ, if they exist. Physical signs tell us merely the existence of physical conditions mechanically sufficient to produce these signs. They tell us nothing of the state of the vital actions going on in the lung, and to which these physical signs owe their presence. Dr. Stokes, in his admirable work on Diseases of the Chest, has made the following well-pointed observations on the mode in which physical signs are to be considered and estimated:—"It cannot be too often repeated that physical signs only reveal mechanical conditions which may proceed from the most different causes ; and that the latter are to be determined by a process of reasoning, &c. &c. Without this power, I have no hesitation in saying, that it would be safer to wholly neglect the physical signs, and to trust in practice to symptoms alone."

One of the best preventive means against the occurrence of this pulmonic derangement will be in a full and free circulation of cool fresh air about the patient, insured by constant and free ventilation, and the removal of bed-curtains and all other impediments. Physiology tells us that if the blood be not sufficiently oxygenized by respiration,—its passage from right to left side of heart through the lung is obstructed ; and this

physiological fact at once shows us the importance of free and pure air about a patient.

Our next consideration is, supposing symptoms of the pulmonic lesion we are considering to show themselves, what is to be our course of treatment. There may be either congestion alone, or congestion with commencing effusion, or congestion with effusion of great amount into the bronchial tubes. If the last be the state of the case, our only hope depends on carbonate of ammonia, wine, camphor, and repeated application of sinapisms and flying blisters, with attention to the state of the abdominal organs, to prevent any distention of them that might impede the free action of the diaphragm, and thus obstruct respiration.

With regard to the treatment of congestion alone, or accompanied with commencing effusion, we must be guided by a careful examination of the function of circulation generally. If there be moderately firm pulse, hot skin, and well-coloured maculæ, and, especially in young persons, or persons in vigour of life, local depletion by leeching or by cupping (which is, I think, preferable), stands first on our list; the necessity for its repetition must be judged of by the same considerations as guide us in its first application. I would recommend this to be accompanied by blue pill and carbonate of ammonia in combination, given in small and repeated doses. The congestions, however, as in Anne Rock's case at page 67, may be from the commencement of a purely asthenic character; the capillary system, through the whole system in lung and surface, being in the

same state, sinking in power, resembling the state of the capillaries in Gendrin's experiments on the capillaries of a frog's foot when gradually losing their vital contractions, and allowing the globules to become stagnant. In such a case our only hope is stimulants, followed, as we lessen these, if symptoms of amendment show themselves, by tonics, such as decoction of bark, with or without ammonia. In short, reflect what would be your views, and what would be the principles of your treatment with such a lung, if, instead of its being an internal organ, it were, with its vessels, like an extremity with its capillaries exposed to your view; with those capillaries in a state of asthenic congestion, with a circulating power rapidly failing, and a corresponding sinking of the general circulation.

I have now to say a few words on the second form, or nervous derangement, its diagnosis and its treatment. In this lesion the labour and rapidity of respiration, as already observed, are often seemingly even greater than in the former; but there are some very distinctive characters. The countenance does not present the congestive or lurid hue which belongs to the first form. It is, on the contrary, pale, or merely flushed, as the natural hue, or accidental accompanying circumstances, may make it; but there is no necessary connexion between the degree of hurried respiration and the appearance of the countenance. The respiratory action, too, is more carried on by the intercostal muscles and supplementary muscles of respiration. There are other characters. The respiratory noise is occasionally so loud that you hear it at a

distance from the bed-side, in some instances amounting to a perfect blowing, so that in expiration the cheeks are distended, while the nostrils are dilated, and keep time in their action to the rapidity of the breathing; the mouth is often kept firmly compressed, unless in expiration, when, from the lips not parting sufficiently, the blowing sound and the puffing of the cheeks I have noticed are produced. The sound is very different from the rhonchus, sibilus, or rattle of congested or obstructed bronchial tubes. This lesion may terminate fatally by running into some of the forms of pulmonic derangement already noticed. Of itself it is not fatal; it often precedes or accompanies delirium or great nervous agitation, and is dependent on some lesion of the nervous system, in which its cause and its treatment must be sought. It is most usually connected with a state of irritation or debility, requiring camphor, hyoscyamus, or wine.

There is a variety of nervous or cerebral respiration which indicates great danger, in which the respirations are very slow and very deep, the chest rising and falling through a considerable space. This form accompanies great cerebral oppression. It indicates an apoplectic oppression, and the treatment resolves itself into that for coma, already considered.

LECTURE VIII.

SUMMARY.—DETAILS OF TREATMENT VARY.—PRINCIPLES
REMAIN THE SAME.—TYPE OF FEVER.—SPECIFICS: NONE
CAN EXIST.—QUININE TREATMENT, OBSERVATIONS ON.

WE have now gone through the treatment of fever function by function, making our analysis of fever the foundation on which we have endeavoured to establish and explain the principles of treatment. If I have succeeded in making my views intelligible, they will, I hope, explain how combinations of remedies are required and prescribed in cases where several functions are simultaneously deranged; and how treatment will vary according to the function principally affected, and the degree to which it is affected. If we take a case function by function, we can understand how at one and the same time leeching, cold, or hyoscyamus, may be requisite for lesion of the cerebro-spinal system; mercury for interruption of the nutritive function; and wine for commencing failure of the circulatory system. We can also understand how the proportions in which we are to combine the various remedies must vary according to the relative degrees in which the separate functions are affected. Thus the details of treatment of no two cases of fever may be alike, and yet the principles that direct the treatment are fixed. It is sometimes objected by the un-

thinking, or by those who reason from the fixity of the pathology of local diseases, and from a corresponding certainty as to their treatment,—that the treatment of fever is ever vague, and without rule. This charge would be more applicable if treatment were unchangeable, while the derangements of the vital functions which constitute fever are ever varying in nature, in degree, and in proportion; if the same treatment were to be applied to all cases of fever, without regard to the particular lesion of function of each particular case, or to its nature, to a case in which there was derangement of the cerebro-spinal system, with little or no affection of the circulatory system, as to another with the most marked derangement of the circulatory system, with little or no disturbance of the nervous system. I do think, that if we view fever as we have here considered it, the principles of its treatment become as certain and as obedient to fixed rules as the treatment of any other disease with which we have to deal. The same views will explain to us what we are to understand by the type of fever. The type of fever to which, and justly in practice, so much importance is attached, is dependent on the predominant functional derangement which gives the character to the prevalent fever of the time being, and, whatever that may be, regulates the treatment for the corresponding time. As that varies, so ought the treatment to vary, and thus writers at different epochs may recommend even opposite treatment, and yet be quite correct in their observations and in their practice. Sydenham has made

an observation, the truth of which is known to every practical physician of experience,—that the type of fever is frequently changing, and that there is for its treatment no knowledge more desirable than an acquaintance with the epidemic constitution of the time being. He has further noticed, that when the type changed, he was frequently very unsuccessful in his practice, until observation made him acquainted with the new type. We shall always at once discover the type if we carefully analyze the functions affected. The type will be determined by the function most affected; and local disease, should it arise, will most frequently occur in the organs principally connected with the performance of that vital function, whatever it may be. I think that the inference will now naturally occur, almost without observation on it, that you must not attach yourselves in practice to any particular dogma or line of treatment; but meet each lesion of function with its appropriate treatment; the principles that guide its application remaining steady, but the details necessarily varying; you must neither become exclusive adherents of treatment, by wine nor by bark, by bleeding nor sudorifics, by purgatives nor diuretics; but ever bear in mind, that each lesion of function has its own remedy, to be regulated in application and in degree by the lesion of function which it is intended to relieve. Guided by the same principles, recollect, that treatment is to be regulated not by the circumstance of its being the fifth, sixth, or tenth day of fever, but by the state of each particular function, day by day. Do not ask what

is the day or stage of the fever on which any remedy is to be employed, but, what is the state of the function at the moment, to be combated at the particular time.

One case of fever may require as much wine on the second day of its attack as another on the twentieth; and the bleeding or leeching that will not be borne in one case on the third day, will benefit another after a lapse of many days.

This appears to me to be the fitting place to make a few observations on what are sometimes announced as specifics, or remedies of general application in fever. There have been many,—yeast and cold affusions, chlorine and quinine have each in turn been highly lauded. There can be no such remedies. To suppose there could be such would be to claim that the same remedy had equal and opposite powers; that it would highly stimulate the function of circulation in one case, and depress it in another; that it would calm down an excited brain into sleep, and equally restore it from coma to wakefulness; that it was a remedy of universal power, equally applicable to lesions of all functions, and to such lesions, whether arising from increased action, debility, or mere excitement. If fever were a local disease, or even were it always a lesion of some particular function, and of the same kind, there might then be some one treatment or remedy peculiarly applicable, just as there is for some local affection: but with the lesion of function ever varying, not only as to the function itself, but as to degree, and as to kind, it is obvious that there can, as already observed, be no specific remedy. The last re-

medy of this class that has attracted attention is quinine administered in large doses. I had an opportunity of observing a trial of it in the hands of Dr. ———, who was, I believe, the first to introduce it here from South America. I must class it with all the others that have preceded it, with this additional objection to it,—that it appears to me to produce occasionally great irritation of the mucous membrane, and to exert a very depressing effect upon the pulse. On its introduction in the year 1850, I afforded every facility for testing its efficacy, transferring from myself altogether the management of cases selected for its exhibition.

CASE I.—Patrick Maguire, ætat. twenty-three years, was admitted into the Hardwicke Hospital, November 12, 1850. He was then five days ill; pulse 88; tongue moist and furred; with headach, flushed face, and constipated bowels. He was ordered a castor-oil draught and the ordinary acetate of ammonia mixture of the hospital. I was assured that quinine would cut this case short, or cure it in two or three days. Five grains of quinine were given every three hours. This was persevered in for two days, when on the eighth day the patient's state was as follows:—The skin was dry, and covered with maculæ; there was little sleep; the tongue was dry and brown; and very severe purging set in. I did not feel myself justified in sanctioning the further continuance of quinine in this case with such symptoms. A blister was applied to the abdomen, and the ordinary treatment for such symptoms substituted; on the twentieth day he left the fever for the convalescent ward.

In this case it is obvious that great irritation of the intestinal mucous tissue was produced, and that it would not have been justifiable to have continued the exhibition of quinine. It altogether failed to shorten the attack. In the following cases it was given with a view to test its power of arresting the progress or development of maculated fever.

CASE II.—William Farrell, ætat. thirteen years, had slept in the same apartment with his mother up to the date of her admission into hospital, some days before, in an advanced stage of maculated fever. He was admitted into the Hardwicke Hospital, 28th May, 1851, second day of his illness. On the evening of the day before admission he had been seized with rigors, and on admission presented the following symptoms. Pulse 112; skin very hot; tongue clean and moist; headach; face flushed; bowels open; respiration quiet. Ordered a bolus of calomel and quinine, of each ten grains. Next day, five grains of quinine every two hours, which was discontinued the evening of the following day, as singing in the ears, &c., had come on. The maculæ, however, came out as usual, when, as the quinine had appeared to exert no influence in arresting the course of the disease, it was discontinued. The disease ran its usual course to the fourteenth day, when convalescence was established.

This case afforded a fair opportunity of testing the power of quinine to arrest the development of typhus fever, as its exhibition was commenced within less than forty-eight hours of the rigor which ushered in the disease, and some days before the ordinary time of the appearance of maculæ.

A remarkable effect in many of the cases in which quinine was given was, its depressing effect upon the pulse. In the ordinary relapsing fever, with creamy tongue, and tending to perspiration, quinine in moderate doses is, like bark, a good tonic; but I have not seen any peculiar advantage from the exhibition of large doses in any case of continued fever. I would decry no remedy: there is, perhaps, scarcely a remedy recommended that may not be useful; but there is on the other hand no doubt that great evils have arisen from the indiscriminate employment of new remedies supposed to be specifics, or of general application. There is a general tendency to have recourse to them on their first introduction, and more evil is likely to result when the remedy happens to be of an active nature. I have, therefore, this additional reason of precaution as my motive for dwelling a little on the subject of specifics in fever.

LECTURE IX.

TYPHUS FEVER.—LOCAL DISEASES IN CONNEXION WITH.—
COMPLICATIONS AND SEQUELÆ.—ABRASIONS OF SKIN.—
BED-SORES.—SOLUTION OF GUTTA PERCHA.—ADJUSTING
BED.—INFLAMMATION OF LYMPHATICS.—FORMS OF.—
PHLEBITIS.—JAUNDICE.

IN our first Lecture we discussed the question of connexion between local disease and fever, and the conclusion at which we arrived was, that fever not only exists, but that it may prove fatal, without any local disease whatever. But this must not lead us into the error of supposing that local disease may not occur in the progress of fever, or arise out of it. On the contrary, we must ever bear in mind, that almost any local disease may be coincident with fever, from ulcer of the cornea to abscess of the brain; and hence, we have not only to watch the progress of fever in regard to those functional derangements which constitute it, but to watch during its progress, and during convalescence, the various complications and sequelæ that may occur. It would be quite impossible to take up all these; they would, in fact, include all the local diseases to which the body is liable. We can only make room here for the general observation, that while the fact is remembered, that any local acute disease may arise in the pro-

gress of fever, its symptoms must not be expected to present as marked and prominent characters as when it arises as a purely idiopathic affection, but will be marked by the lessened sensibility produced by the heaviness of fever, and that its treatment must be a modification of the ordinary treatment of such local diseases, with the treatment suited to the type of fever under which the patient labours.

There are, however, some of the complications and sequelæ that it would not be well to omit noticing.

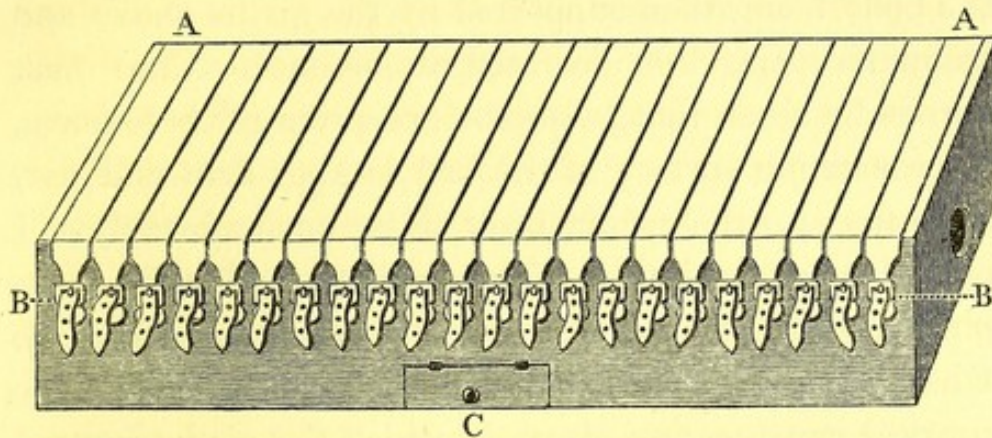
Among the complications in long-continued cases, one of those most to be dreaded is the occurrence of bed-sores. In some cases, no care almost will prevent their occurrence ; but in most cases, constant and unceasing attention to dryness and cleanliness will be effectual. Examine the patient's hips and sacrum every day. Immediately on any darkness or congestion of the skin showing itself, use the ordinary lotion of camphorated spirit to the parts. This stimulates the debilitated capillaries to increased action, and the circulation is restored ; after the lotion has been applied, have the parts always well dusted with fine hair-powder, to keep the skin dry, and to protect it from friction. If the slightest abrasion or fissure show itself, or that the blush of congestion become permanent, the application that I should then most strongly recommend, and I can do it with confidence, is solution of gutta percha in chloroform. The strength of this solution should be half a drachm of gutta percha in one ounce of chloroform. If it be more concentrated than this, the solution is too thick for pro-

per application, and is too long in drying, and if weaker, the solution is too thin, and runs too diffusely over the surface. The gutta percha used should be that which is in the sheet, like oiled silk, as it is the purest; and care should always be taken that the chloroform is very good, for otherwise the application, instead of perfectly drying, remains glutinous, and, adhering to the bed-clothes, under the patient's weight, gives great pain when the sheet is attempted to be separated from the skin. A simple way of testing the solution for its efficacy is to pour a large drop of it on the back of the hand. If it be of good quality, it dries off within a minute, leaving on the skin a thin but firm pellicle, perfectly dry, not adhering to the finger firmly pressed upon it, and capable of being drawn off in a consistent pellicle of a light colour, resembling natural cuticle. If it remain in the least degree glutinous, it should not be used. The solution is applied with a camel's hair pencil, so as to make a layer, when dry, of about the thickness of thick note-paper, to be repeated, as it may require to be renewed from time to time. The camel's hair pencil, which had grown hard from drying, becomes pliant for each fresh application by merely immersing it and stirring it about for a moment in the solution on the next occasion of using it. The effect of this application in preventing and healing abrasions of the skin of the hips and sacrum is most gratifying. It seems to have a power in this respect, perhaps by protecting the sensitive extremities of the nerves, far beyond what any

arrangement of pillows or air-cushions possesses. It is also applicable even to ulcerated surfaces, if not of great depth, provided that care be taken on each application to clean the surface well, and that equal care be taken in examining the part next day, to see that the layer of gutta percha does not confine matter. To prevent this, make a small opening in the covering over the deepest or most depending portion of the ulcerated surface.

In some cases, however, of very protracted fever, notwithstanding our best care, large patches of skin and cellular membrane will run into sloughing, perhaps, on both hips or sacrum, or on all three, and will involve even the osseous tissue underneath, so that there is often the greatest danger of the patient's sinking, from the pain, want of sleep, purulent discharge, and colliquative sweats, resulting from the local ulceration. On the usual details of the employment of fermenting poultices, warm dressings, &c., it is not necessary for me to dwell here. With these you are sufficiently well acquainted; but I wish to recommend to you a bed which I introduced some years ago in the management of such cases, and which will occasionally be found very useful. It consists, as the engraving shows, of an oblong frame of wood, of about the size of an ordinary hospital bedstead; viz., about six feet six inches long, two feet eight inches broad, and about eighteen inches deep; made of stout deal, one inch and a quarter thick. The upper surface, on which the patient is to rest, is formed of girth-web, three inches wide, such as is used in riding-girths. These

are firmly nailed, closely side by side, along one side of the frame A A. On the corresponding side of the frame, B B, they are tightened or loosened at pleasure, by leather straps and buckles, like saddle-girths. In the centre of the frame, at C, is a small door, which will



be found occasionally useful for the introduction of a pan. To make this bed ready for the reception of the patient, buckle home all the straps as tightly as they can be pulled. The girth-web surface will then form a plane like an ordinary mattress. Then lay on this a folded blanket, which is not to extend lower than where the hips will rest. Let a similar folded blanket be laid on from below, but extending upwards, so as to lap a few inches over the lower edge of the first blanket. This simple arrangement will enable the patient's wants to be attended to by merely doubling down, as occasion may require, the upper portion of the lower blanket. From want of attention, in the first instance, to this simple precaution in laying on the under blankets, I have seen a patient suffer much disturbance, and the attendant incur unnecessary trouble. The under sheets are next

to be laid on, the same arrangement being followed as with the blankets. The patient being laid on the bed, which is so far perfectly flat, whatever strap presses up against any painful or ulcerated part is slackened until the pressure is relieved, the weight of the body being then supported by the girths above and below the painful or ulcerated prominence. Care must always be taken that, with the exception of these parts, the remaining surface of the bed is kept firm and flat, for otherwise the whole body sinks uncomfortably. I published a description of this bed in the Dublin Hospital Gazette of February 15, 1845, and since that time I have seen a modification of it offered for sale by some surgical instrument-makers, in which the girths, instead of being firmly fastened by buckles, as in this, are attached to vulcanized Indian rubber rings, which can be loosened at pleasure, and which, when not loosened, allow the girths generally to yield under the weight of the body. This is, however, a deterioration, for the whole principle of the bed is involved in affording so firm a support to the sound portions of the body as to relieve the affected parts from the weight. The bed, as I have described it, will be found useful in other cases than those of sloughing after fever. I have seen a patient suffering from inflammation of the hip-joint procure instant and refreshing sleep on it, after pillows of all shapes and sizes had been used in vain. The bed is also applicable for another purpose, as a useful auxiliary in giving a hot-air or vapour bath; the tube of Duval's apparatus, or from a steam digester, being introduced

through a circular opening in one end, while a wicker cradle, covered with blankets, is laid over the top. The hot vapour is thus at once brought under and around the patient's body. There are already in use several admirably contrived and mechanical constructions of beds for invalids, including Arnot's well-known water-bed. I do not venture to propose the bed I have described as superseding any others, but it possesses some advantages that may render it deserving a place among mechanical contrivances for the relief of the sick. It does not promote or confine perspiration. It gives a facility for the requisite attendance about a patient, and it is of little cost; so simple in its construction, that it can be made up in a few hours; and it is not easily put out of order. Mr. Adams has suggested, that for some cases of fracture, where great firmness of support is desired, with immunity from pressure on some particular points, a useful modification of the bed might be constructed, by substituting for the supporting girths narrow slips of wood covered with cushions or pads of corresponding breadths,—any one or more of which could be removed without disarranging the others.

Inflammation of the lymphatics of either lower or upper extremities sometimes prevails epidemically as a sequela or accompaniment of the latter stages of fever. It may be of every degree of intensity, producing painful, suffused, red surfaces, and abscesses of considerable size, with corresponding high irritative fever, or small chains of abscesses running up the extremities at irregular intervals; or the inflammation may go no farther than giving to the skin an erysipelatous pinkish blush,

with tension of subcutaneous cellular tissue. In the first form, the resemblance to diffuse inflammation of a fatal kind is sometimes very striking; but the immunity of the joints, and the duration of the case, will distinguish between them. Diffused abscesses will frequently form close to a joint, and yet not involve the joint itself. The effect on the constitution is, however, very trying. The patient should be transferred as soon as possible to a pure country air; the strength supported by wine in moderate quantities, and sleep procured, if necessary, every night by an opiate; while perspiration and diarrhoea, if these consequences are present, are to be met by bark, acids, &c. Into the surgical treatment of this affection I will not enter here. In the second form, that characterized by chains of small subcutaneous abscesses, often forming with little constitutional disturbance, of sizes varying from that of a pea to a hazel nut, and sometimes preserving the colour of the skin, I have to observe, that it is better not to open them. They are generally seen along the lower extremities, and when existing, are in considerable numbers. If they are opened, there are so many points of irritation created. I have sometimes merely pressed upon each of them firmly with the finger; the walls are so thin that they readily give way; the contained fluid escapes into the surrounding cellular tissue, and is absorbed and removed without further trouble or constitutional disturbance. Abscesses of this kind are found most often along the great chain of superficial lymphatics running up the inner side of the thigh. Sometimes, without any redness showing itself, the calf of the leg becomes hot, swollen, painful, and pitting

slightly on deep pressure, but without change of colour. This appears to arise from inflammation of the deeper lymphatics; it seldom goes on to the formation of abscess. When this affection shows itself, the patient must at once be confined to bed; and I attach great importance to position. The leg should be elevated on pillows, so inclined as to raise the lower portion of the limb above the level of the trunk, and some leeches applied over the most swollen and painful part. After their application, the bandage fomentation should be employed, which is prepared thus:—Tear up flannel into yard lengths, of the usual bandage width, and, having steeped them for a moment in hot decoction of poppy-heads and camomile, make them into so many rollers, and, squeezing out the superfluous moisture, roll them successively round the limb, until they are laid on, three or four folds thick, over the extent desired. Then take similar rollers of dry flannel, and apply them in like manner, three or four folds thick over the first applied and moist rollers. The effect of this will be to prevent evaporation, so as to keep up a constant fomenting action without the unpleasant effect of oiled silk, and to preserve a sufficient degree of warmth. You will find this a cleaner, lighter, and more comfortable application than poulticing; and it does not require to be renewed more than three times in the day.

Adhesive phlebitis is sometimes a very troublesome sequela of fever, not only in its immediate consequences, but in its after results, the leg and thigh frequently remaining enlarged for weeks after recovery, and varicose

veins then succeeding and continuing for life. Its first approach should, therefore, be carefully watched. The inguinal and femoral veins are those most often affected; and the patient will occasionally direct, at first, all his attention, perhaps, to the dorsum of the foot and the instep, one or both of which have become œdematous. It is only on your making pressure on the groin, that the patient discovers there is tenderness there; and the venous trunks are felt like cords, swelled, rounded, and hard, and tender on being pressed upon. The groin must be leeches perhaps two or three times in succession; the patient at once confined to the horizontal position; the limb elevated, as already described, in an incline, above the level of the trunk; mercury administered internally, if the patient be in a fit state to bear its exhibition; and, either in conjunction with this, or exclusively of it, gentle mercurial inunction, applied over the groin twice a day. If the limb become generally swollen, the bandage fomentation, as already described, should be employed.

Jaundice is, I may say, a frequent sequela of late years. It has some peculiarities; it appears often without any symptoms of local inflammation, and although the skin and urine are deeply tinged, the bile still continues to flow along its natural passages. The debility accompanying it is occasionally considerable. In cases uncomplicated with local disease, turpentine is generally efficient in removing it, without any mercurial treatment, in doses of from one to two drachms three times a day for a few days.

LECTURE X.

ACUTE FOLLICULAR ENTERITIS (SYNONYMES: DOTHINENTERITIS; TYPHOID FEVER; TYPHUS ULCER; ABDOMINAL TYPHUS; ILIO-TYPHUS; FIÈVRE MUQUEUSE, ETC.).—PATHOLOGY OF.—ITS RELATION TO TYPHUS.—SYMPTOMS OF.—PECULIAR ERUPTION IN.—DURATION OF.—TREATMENT OF.—LEECHING.—BLISTERING.—OPIUM.—BARK.—WINE.—INTESTINAL HEMORRHAGE.—MANAGEMENT OF.—CONCLUSION.

THESE Lectures would be very incomplete without some notice of a disease which bears a very close resemblance to maculated fever; and has even, by some writers, been supposed to constitute the pathology of typhus fever.

I shall very briefly narrate a case to fix the disease in your minds, previously to entering on any general observations.

Mary Cope, ætat. 22, previously in the enjoyment of the best health, was admitted into the Hardwicke Fever Hospital on the 23rd January, ill of maculated fever. There was nothing unusual in her case. She was soon marked convalescent; when, on the 5th February, fourteen days before her death, she complained of debility and of diarrhœa; her tongue became brown and dry in the

centre, but not furred; there was no tenderness of abdomen, nor tympanitis, but there was gargouillement over the cæcum; and the stools were like gruel, but neither mucous nor bloody, nor was there any tenesmus. The pulse became quicker and weaker. On the 18th February she required wine in considerable quantity; the diarrhœa became uncontrollable. On the 19th February, fourteenth day of the attack, she died.

Post-mortem Examination.—The peritoneal covering of the abdominal viscera was sound, but the ilium and a portion of the colon presented follicular enteritis in all its stages. The greatest intensity was at the ilio-cæcal valve, the entire circle of which was occupied by a depressed, jagged, greyish, irregular ulcer. In the ilium both the isolated follicles and the “glandulæ agminatæ,” or glands of Peyer, were attacked. The sites of the affected “glandulæ agminatæ” were marked by oval ulcers, while around and above them isolated follicles were seen in similar ulceration, but not to such a degree. In addition to these ulcerations, the isolated follicles in both the lower portion of the ilium and the upper portion of colon presented every stage of the disease. Some follicles were just protruding under the mucous membrane, filled with a cheesy-looking purulent matter, the mucous membrane around being swollen, red, and prominent, and from the orifices of the follicles looking like depressions, those follicles bore a strong resemblance to variolous pustules. In others the matter was in such quantity that the affected follicles presented the appearance of spherical projections, attached by pedicles, and covered by

mucous membrane, hard and firm to the touch, while in others, still more advanced, the follicles had gone on to ulceration, destroying the mucous membrane, and leaving only a grey slough of cellular tissue in the place of the follicle itself. The appendix vermiformis was swollen and congested, and, on being slit up, was found distended with a tenacious purulent fluid, and some of the mesenteric glands were infiltrated with purulent matter. This was a case of great rapidity and of equal severity. In most cases the disease is bounded by the ilio-cæcal valve. In another case, occurring about the same time, which ran a longer course, the lower part of the ilium was found extensively ulcerated, the ulcers presenting different appearances ; some of them presenting the striking resemblance already described to the pustules of variola, others having the appearance of white cicatrices, as if traced out by a snail traversing a zigzag course along the mucous membrane ; while others again, with loss of substance in the centre, but with soft pulpy areolæ, projected above the surrounding mucous surface. In this case, as is most usual, the disease was confined to the small intestine.

This disease may be of every degree of intensity, proving fatal within ten or fourteen days, or verging into convalescence within two or three weeks ; or, when there has been more extended disease, occupying even months in its progress and cure. It is in its most acute form that it bears the strongest resemblance to typhus, from the sudden prostration of strength, dry and furred tongue, maculated appearance of skin, and accompanying

delirium. We have already, in our first Lecture, sufficiently shown, I hope, that there is no necessary connexion between this disease and typhus. We need not revert to this. But we must not forget that this disease, like any other, may take its origin in the course of a case of typhus, or may occur quickly supervening, as in Cope's case; in other words, that while typhus exists without it, typhus gives us no surety against the complication or supervention of this disease. Follicular enteritis, of moderate degree, and typhus, cannot continue "*pari passu*," because typhus must either terminate life, or terminate itself in crisis within a few days, while follicular enteritis, which has arisen during typhus, will continue, after the disappearance of typhus, to run its own course of weeks, or perhaps months. If follicular enteritis occur early in typhus, as one of its complications and of great severity, as in Cope's case, death may take place, from the combined effect of the two diseases, within a very few days; but still the connexion between the two, typhus and follicular enteritis, is merely incidental, and is not essential.

I shall now draw your attention to some of the points of difference, as well as of resemblance, in symptoms, between this disease and true typhus.

One of the first and most remarkable differences relates to age. Acute follicular enteritis appears to be nearly altogether confined to persons under thirty or thirty-five years of age. Pure typhus may attack all ages, but is most formidable after forty.

The aspects of two patients—one in typhus of four or

five days' duration—and the other suffering under this affection, are generally very different, indeed, often so different, that a first glance is in some cases sufficient to distinguish the two diseases. In acute follicular enteritis, the patient's countenance, instead of presenting the lurid, heavy hue of typhus, shows a circumscribed flush of bright or even pinkish red on each cheek, nearly circular or oval, and separated by an abrupt boundary from the surrounding white skin. The lips are also redder than natural, and the eyes, instead of being dusky and heavy, are most often brighter than natural, and whiter in the sclerotic. The delirium, too, has some distinctive features. The patient when spoken to is quite conscious, and even sometimes apparently possesses increased quickness of apprehension, but, left to himself, relapses into raving; or, if the attendant quit the room for a moment, is out of bed to look after papers, to arrange clothes, &c. The pulse is, I believe, always quick; the skin does not present the dark mottling of typhus, but shows an eruption that has some very peculiar distinguishing characters. It consists neither of maculæ nor of petechiæ, such as described in Lecture VI., but of lenticular or oval elevated papules, which can be felt to be raised by passing the finger lightly over them. They are generally light red, and in some cases I have seen them in such numbers, and scattered so diffusely over the body, as to bear a very strong resemblance to the congested papules of the first few days of modified variolous eruption. They are not confined to any particular part of the surface. I have seen them

in such quantities on the hands, and arms, and legs, as to become confluent; and I have also seen them on the face, but not thick. When in small numbers, they are most frequently scattered at distant intervals over the epigastrium, and umbilical and iliac regions. Their time of coming out and their duration are very uncertain. They may make their appearance on the second or third day after the patient has lain down, or they may not show for several days afterwards. I do not think the time of the appearances gives any diagnostic mark between this eruption and the maculæ of typhus fever.

The stigmata of this eruption and the maculæ of typhus can be equally made to vanish temporarily under pressure, and both in this respect differ from true petechiæ, as already explained in Lecture vi. Although this eruption and that of typhus equally come out at uncertain intervals after the onset of the general symptoms, their after progress is not alike. The maculæ of typhus, if the case be severe, either suddenly recede or become darker, and mixed with petechiæ as the case becomes aggravated, or, on the other hand, become lighter in colour as it goes on favourably, preserving a corresponding course with the progress of the case; but the rose-coloured papulæ of follicular enteritis show no such regularity. They may be in great numbers in a mild case, and comparatively few in a severe case, and they may rapidly subside, and again re-appear without apparently any corresponding alteration in the internal disease. The tongue is generally fissured and peculiarly

and painfully dry in the centre, the cuticle appearing in some cases to crack and fissure as if from very dryness, and the patient complaining most bitterly, not so much of thirst as of the intolerable burning dryness of the tongue and mouth. The remissions of fever are peculiarly marked in the countenance, the face presenting the circumscribed flushings heightened to the most florid colour in the exacerbations, and the cheeks becoming pallid in the remissions. As to the state of the abdomen, there is nothing positive; it may be swollen, or so soft and yielding as to permit the hand to feel the spine through the viscera. There is usually gargouillement over the right iliac region; and I believe all observers agree that diarrhoea is generally present, constipation being the exception. The evacuations are generally gruelly pale, or fawn-coloured, with very small scale-like bodies like minute pellicles of yellow wax floating on the surface, or with minute, dark-coloured dots in great numbers, like specks of coffee-grounds seen lying in the bottom of the vessel if it be gently inclined to one side. The evacuations, however, may appear to be purely bilious, such as would be produced by saline purgatives. Intestinal hæmorrhage and perforating ulcers form the two most dreaded complications of this disease. The wasting is very remarkable, far beyond what is ever seen in maculated fever, the patient being sometimes reduced, after some weeks' duration of the disease, to a mere skeleton, presenting an emaciation only to be paralleled by the wasting consequent on chronic dysentery. The absence or presence of pain on pressure appears to be altogether

dependent on the diseased action approaching or involving the peritonæum; but there is another kind of pain resembling colic, occurring in paroxysms, and so excruciating that the patient cries out in screams of delirious agony, and seems to continue to scream as if convulsively, after the pain has ceased. Of the duration of the disease, as already observed, there is no certain rule; some cases proving fatal within ten or fourteen days; others passing into a sub-acute stage, and extending through a period of several weeks, and in some cases through a slow convalescence, extending even to some months. In the generality of cases, amendment begins to show itself at the end of the third week; but there is never the rapid crisis of typhus, with its sudden transition from the most imminent danger to almost perfect health, debility alone excepted; on the contrary, in this disease, the recovery is either remarkably slow, the amendment being step by step, and little more than perceptible from day to day; or, if there be an approach to crisis, which is most often indicated by the urine, the deposition of lithates is not continued and copious, as in the true crisis of typhus, but shows the deposits scantily and with remissions.

The sequelæ of follicular enteritis are much to be dreaded. The state of the mesenteric glands, even in the acute form, has been already noticed, infiltrated with purulent matter; but exclusively of this immediate danger, if the patient be young and of scrofulous temperament, mesenteric disease and consequent phthisis are to be feared during convalescence; and when phthisis does

set in as its sequela, its progress is often very rapid, running to its fatal termination occasionally within less than three weeks from the occurrence of the first pulmonary symptoms. However, on the other hand, the recoveries that take place from this disease are not less wonderful; the mucous membrane, not only of intestines, but of the whole bronchial tract, being involved in one simultaneous irritation, with wasting quickened pulse, cough, and copious expectoration, and yet perfect restoration to health taking place after many months.

You will, I hope, from the description I have given you, be able sufficiently to recognise this disease, and the points in which it differs from simple continued fever, and maculated or typhus fever. The distinction is practically of the greatest consequence; for you dare not venture to subject the mucous membrane of the intestinal tube in this disease to those active agents and stimulants which it will bear, not only with impunity, but will receive with advantage, in typhus. Recollect, with these ulcers or diseased follicles, how thin a layer of serous membrane literally stands as the barrier between life and death in this disease, whether the death result from hæmorrhage or from perforation; and that a purgative or an article of diet injudiciously exhibited may at any moment cause the one or the other. There is, perhaps, no other disease in which recovery, and even life, depend so much on attention to details of treatment, and on steadiness in withholding officious interference no less than in judicious management.

In this form of fever (if we may still call it so, in ac-

cordance with professional phraseology) purgatives, so often administered in popular ignorance, are very often followed by excessive irritation and profuse diarrhœa. They are seldom required at any time in its progress; and after an onset of diarrhœa, such as described, constipation may be permitted to continue for several days, not only without injury, but with advantage. In the early stage of the disease, I believe our three principal remedies may be summed up under the heads of leeching, blistering, and opium. Leeching holds, certainly, the first place. If there be tenderness on pressure, diarrhœa, or gargouillement present, either separately or combined, along with those constitutional symptoms already described under the head of pulse, tongue, skin, &c., from six to twelve leeches should be applied over the region of the cæcum. Leeching may be repeated after another day or two, or blistering substituted; and here, as already recommended, do not put on a large blister at first. The disease will be better kept in check by repeated small and successive blisterings. Opium I have mentioned as the third main remedy; but remember, the object in giving it is not that it should act as a full anodyne, but to maintain as much quietude as possible of the intestinal tube; and with this object its exhibition ought to be frequent, but in very small doses. One grain of Dover's powder, which is, I think, the best preparation, should be steadily given every two or three hours, sometimes for many days in succession. Let the intestinal canal lie as little disturbed as possible, but having gained this, press opium no farther. There will oc-

casionally occur a case in which the paroxysm of pain, already described, comes on, causing great suffering; in such, a dose of opium at the time, in addition to its exhibition in minute doses, may be desirable. A similar observation is applicable to a form of delirium, which is not an unfrequent symptom in this disease. The patient is for one or two nights without sleep, and resembling in his ramblings a patient in delirium tremens. An opiate of twenty or twenty-five drops of the solution of muriate or acetate of morphia will often have the happiest effect in procuring sleep and checking the delirium sympathetic with the intestinal irritation; but it will be the safer course not to venture on it in a very early stage. It will be well, however, to bear in mind the caution already given in a former Lecture as to the use of opium, which applies in a modified form even to this disease.

There comes a stage in follicular enteritis when the local symptoms cease to hold the most prominent place, and when the general typhoid state of the system requires the greater share of attention. The mouth is occupied with sordes, the skin dusky, the circumscribed flush on the cheek becomes of a darker colour, or the face is yellowish or pallid, and the patient lies on his back, with lids half closed, and with a pulse quick and weakened. In this state, bark is, I think, of great use, and the preparation which appears to me to be the best is the infusion. If it seem to keep up diarrhœa, the addition of subnitrate of bismuth, in the proportion of five grains to each ounce of infusion, is often sufficient to keep it in check. The administration of wine in this disease requires great caution. It is never required, nor, indeed,

will the mucous membrane bear it, in quantities, such as are sometimes requisite in pure typhus ; and when we recollect that the disease we are now considering is essentially a disease of comparative youth, the caution as to wine will be the more regarded,—as you may recollect that, in speaking of instances of doubt as to the administration of wine in typhus, I advised it to be rather withheld than given too early to the young, as young persons very seldom die in typhus of failure of circulation, whether capillary or cardiac. If wine be requisite, its use should be commenced with very small quantities ; and there is a form of giving it which makes it more agreeable and nutritious, and less irritating than in its plain form, or merely diluted with water :—Port wine, boiling water, of each four ounces ; aromatic confection, one drachm ; sugar, half an ounce ; yolk of one egg. The first four ingredients are to be well mixed, and then gradually added to the yolk of egg, previously well beaten up. The whole to be kept in a bottle for use.

I have mentioned hæmorrhage as one of the most serious consequences to be dreaded. It may come on at any time. I have seen it occur at a period when the patient deemed himself sufficiently recovered to take carriage airing. The patient passes suddenly a large evacuation of tarry semi-coagulated blood ; another and another follow, each becoming more fluid, and the patient quickly becomes anæmic, hiccup supervenes, the *alæ nasi* dilate and labour in respiration, and the pulse will bear no pressure. The most perfect rest in the horizontal position is above all things necessary. I believe injections are more injurious than useful. They

disturb the patient, and they will not reach the source of the hæmorrhage which is in the ulcerated patches about and generally above the ilio-cæcal valve. Life now hangs on a thread. The treatment I have to recommend in such a case is, the exhibition of turpentine in small doses, five or ten drops, as an astringent, every three hours; ice kept constantly in the mouth, or swallowed in lumps, and the exhibition of iced wine, either claret or port, and water, but only in quantities merely sufficient to prevent sinking. If after such an attack, two, three, or four days pass over without an evacuation, do not be anxious. A purgative, or a warm stimulating injection, may reproduce the hæmorrhage. If the retained intestinal contents do not give rise to pain or swelling, there can be no necessity for evacuating then. Recollect that the intestines are fitted by nature to retain fæcal contents, and of the most varied kind, and therefore do not be over-anxious to procure evacuations, and for no other reason than the groundless supposition that fæces retained for a few days must be injurious. If in such cases as we are now describing several days have passed over without an evacuation, the safest way to induce it is by the introduction into the rectum each morning of a piece of tallow candle, of the thickness of a full-sized rectum bougie, and about four inches long. This should be introduced well beyond the sphincter, and allowed to remain. Sometimes the introduction of a single piece is sufficient to excite action of the intestines, but in other cases the candle suppository requires to be repeated every morning for two or three days in succession; each previous suppository may be allowed to remain. No uneasi-

ness will be produced if it be remembered to use only the common tallow candle, which the moderate heat of the intestines is sufficient to soften down. If perforation occur, indicated by symptoms too well known to render their description necessary, opium and absolute rest afford the only chance of recovery.

Convalescence from the sub-acute stage of this disease occasionally is so slow as to be almost imperceptible, occupying not only weeks but months, and the slightest error in diet is sufficient to produce relapse of diarrhœa, to light up fever, or to bring on abdominal pains. In some cases the smallest portion of solid animal food cannot be taken without injury, but jellies and broths can alone be borne; in others again the stomach revolts against broth and jelly, and will only bear for a considerable time milk and farinaceous foods; and in nearly all stages of convalescence from the disease, stimulants, as wine, porter, and ale, are either unnecessary or are positively injurious.

I have now fulfilled the task I had imposed upon myself of explaining those principles of analysis, which I trust may aid you in your study of the nature and treatment of fever. You will judge for yourselves how far the views here developed are deserving of consideration. Hoping that they may be found in some degree useful, I thank you for your attention, and now terminate these Lectures.

THE END.

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