A

Graduation Thesis

on the

Clinical History and Pathology

of

Typhus Fever

by

Thomas Evans.

1865

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Edinburgh,
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Introduction.

The first part of this Thesis is devoted to the consideration of the Clinical History of Typhus Fever. The morbid phenomena presented by the different physiological systems, during the course of the fever, are first of all described in detail: then the symptoms as a whole are reviewed; and lastly the Prognosis and Diagnosis of the disease are discussed. The second part treats of the Pathology of fever, and that of Typhus in particular. The order, in which the phenomena follow, shall be considered in relation to the actual duration of the fever in each individual case; and not according to an arbitrary Standard of weeks or days as is usually done. I was induced to study the Symptomatology of the disease from that point of view by the following circumstance:— On arranging the pulse of the first five cases appended, in the manner of the table placed after Case XXIV, it was observed, that the pulse attained its Maximum frequency earlier in cases of short duration than in those of long duration. I afterwards proceeded to investigate all the Symptoms of the disease in relation to its duration in different cases. In carrying out this idea, I have found it very advantageous to arrange the daily observations of each case in a tabular form; so that the different results may be readily compared. My task became thus

very laborious and difficult: and I must crave the indulgence of my learned critics for the imperfect manner in which it has been necessarily accomplished by one of such limited experience.

Several of the cases were observed while the author acted in the capacity of Clinical Clerk in the Clinical Wards: but the majority were observed in the fever ward, ~~under~~ which is under the charge of Dr. Sanders: to whom I am indebted for affording me every facility to carry on the observations. I am also indebted to Prof. McLagan, and his able assistant, Dr. Gamgee, for enabling me to give the estimation of the urea in one of the cases.

In the first seven cases, the observations were made at noon, and in the evening from 7-9 o'clock. In all the remaining cases the observations were made from 3.30 – 5.30 pm. The morning urine was the specimen always examined, unless the whole quantity passed within 24 hours was collected; in which case a specimen of the whole quantity passed was examined. The diet of the patients usually consisted of a little bread with beef-tea or milk. There was no selection of cases: the only cases rejected were those which entered the hospital late; and those in which there was any doubt as to the diagnosis

T. E.

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The Order of the Cases and tables is as follows:-

Typhus. Cases I-V. (reported in a narrative way)

Typhus. Cases VI-XIX. (in a tabular form)

Diagram representing the Ranges of Pulse, Temperature &c in Typhus.

Typhoid. Cases XX-XXI (in a tabular & diagrammatic form)

Scarlatina. Cases XXII-XXIII - - - - " - - - - -

Measles. Case XXIV - - - - - " - - - - -

Table & Diagram showing the average results of observations in several groups of cases of Typhus, the fever being of same duration in each group.

Diagram representing the Ranges of Temperature in Dr. Rogers's Cases of Scarlet Fever.

Table representing the effects of the "wet sheet" on the Pulse and Temperature in three Cases of Scarlet Fever.

Premonitory Symptoms and Mode of Seizure of Typhus Fever.

An attack of typhus generally comes on rather suddenly, but in some cases the health is a little deranged before the beginning of the fever. The individual attacked does not feel so well as usual; he becomes dull, abstracted, easily fatigued, and reluctant to exert either mind or body. Much more commonly, however, a period of incubation of about nine days having elapsed, the first inconvenience experienced is a dull frontal headache, a distinct shivering, with a feeling of chilliness, which induces the patient to keep close to the fire. Pain in the lumbar region also, and muscular pains in different parts of the body are frequently complained of. The countenance appears pale and listless; the patient is incapable of carrying on his ordinary occupations, and becomes sleepless and restless at night. Loss of appetite, thirst, and other febrile symptoms

soon follow, and the patient is rapidly prostrated.

The Morbid Phenomena presented by the different Physiological Systems during the Course of Typhus Fever.

Integumentary System.

The physiognomy of the typhus patient is somewhat characteristic. The countenance, which during the first day or two is pale and languid, soon becomes flushed, and of a dusky hue; the expression dull; and the eyes watery and injected. The general aspect often resembles that of a person made stupid by drink. During the latter half of the fever, the face, as well as the skin generally, becomes paler, and the expression of countenance varies according to the character of the nervous symptoms present. ~~present.~~ The 'critical discharges', which are apt to occur towards the subsidence of the fever, usually produce a more or less marked improvement in the general appearance of the patient. During the period of convalescence, he presents an emaciated, anaemic, and excitable aspect.

The eruption of typhus was described by Dr. Jenner in 1848, as presenting three different appearances according to its stage. First of all it consists of slightly elevated pinkish spots, disappearing on pressure. Secondly the spots assume a reddish-brown colour, ~~not disappearing~~ fading only on pressure. Lastly some spots may become livid or dark, petechial, and not disappearing on pressure. The eruption may not reach the third, or even the second stage at all; but it may be petechial from the beginning. It was petechial on admission, the 4th day, in Case II, which was of 10 or 11 days' duration. The spots composing the rash are generally very numerous, and most conspicuous on the most dependent parts of the body. Usually they are not so well marked in children as in adults. Of the six cases of children (aged 10-15), whose records accompany this thesis, the eruption was not distinct in three, faint in one, and well marked in the two youngest. It was observed by Dr. Henderson and others, that the darker and more copious the eruption, the severer ~~the case~~ would be the fever. In a fatal case which came under my notice, (but which was not recorded), the spots were of a dark bluish tint the day before death. In that case there was

a serious pulmonary complication, and the lips were livid as they are in most diseases of the lungs which prove fatal. Besides the above spots, a peculiar 'mottling of the skin' characterizes typhus.

It is generally supposed that the eruption is due to a hyperaemic condition of the cutaneous capillaries, and that the true petechiae result from rupture of these capillaries, with extravasation. Professor Laycock is of opinion that some constitutions have a peculiar tendency to a varicose state of the capillaries, in which constitutions the varicosity is usually well marked in the capillaries of the cheeks. Granting the above two statements to be correct, it would be natural to conclude, that the greater predisposition there was in a given individual to varicosity of the cutaneous capillaries, the more copious and marked the eruption would be in that case. On reviewing my first seven cases I was led to suspect that the copiousness of the eruption was in proportion to the frequency of the pulse in the different cases; however a more extensive observation has convinced me that this is not the case. For instance, the eruption was copious and marked in Cases VI and XII: in the former the

pulse at one time was 154 per min., but in the latter never higher than 110. The eruption of typhus never appears in successive crops, but fresh spots may come out for a day or two after the first appearance of the eruption. Each spot remains visible till the whole rash vanishes. The moulting of the skin generally disappears early.

Statistics show that the eruption most commonly comes out on the 4th or 5th day of the fever. Dr. Murchison states, that he has rarely met with a case, where he could be certain that the eruption made its appearance later than the 6th day. It made its appearance later than the 6th day in two at least of the accompanying cases. Viz. Cases VI and XV, of 18 and 22 days' duration respectively. The eruption is reported to have been observed as early as the 3rd day. It was visible on admission, the 3rd day, in Case XVIII, which was of 12 days' duration. Dr. W. T. Gairdner thinks he has observed the eruption earlier in its appearance and disappearance of late years.

The following facts tend to show that the time at which the eruption appears, is not such a matter of accident as is generally supposed. It is to be regretted, that, owing to the late period the majority of the cases came under observation, several of

* Compare Cases VIIJ and XV with VJ and XIIJ.

them only afford a negative kind of evidence, and others have to be omitted as of no value for this inquiry:—

In Case VII, duration 22 days. Eruption appeared on 8th day

" " XII, " 22 days, " observed as early as 7th day

" " VI, " 19 days, " appeared on 6th day

" " XV, " 18 days, " appeared on 7th day

" " X, " 18 days, " observed as early as 7th day

" " I, " 15 days, " to 5th day

" " XI, " 15 days, " 5th day

" " XIV, " 14 days, " to 4th day

" " IV, " 13-14 days, " 4th day

" " XVIII, " 12 days, " 3rd day

The above show that the eruption appeared early in the cases which recovered early, but not till a late period in those cases in which the fever was prolonged. It is probable, however, that when the eruption is well developed, it will have a tendency to appear comparatively early, and remain persistent till a late period.[x] The eruption generally made its appearance just before the temperature attained its maximum. It is interesting to notice the correspondence between the eruption and the temperature in

different fevers. Thus in scarlet fever the eruption appears on the 2nd or 3rd day, and the temperature in that disease attains its maximum about the same period; whereas in measles and typhus the eruption appears and the temperature attains its maximum about the 5th day.

The skin is usually dry during the course of typhus; but a copious perspiration frequently occurs as a 'critical discharge' about the time the fever subsides. Dr. Parkes has shown how these critical discharges are associated with a marked fall in the temperature. On reference to the accompanying cases, it will be seen, that sweating, ~~at this period was~~ was invariably followed by a rapid fall in the pulse and temperature. In case XII, copious sweating occurred during the earlier part of the fever, when the temperature was rising. Sudamina occur but rarely in this disease. It has been observed that the skin very commonly exhales a peculiar odour. Buboes, consisting of inflammatory swellings of the areolar tissue in the neighbourhood of the salivary glands, sometimes form. Dr. Murchison regards typhus cases of typhus

Frequency of eruptions not noticed—

/phlegmatia

in which these buboes occur, as connecting links between this disease and the oriental plague, in which the occurrence of buboes is the general rule. Furunculus and anthrax are common during convalescence. Swellings of the lower extremities, resembling phlegmasia dolens, have occasionally been observed by Tweedie and others who have had large experience in fevers.

Temperature. - An excessive heat of skin has long been recognized as one of the most unequivocal indications of a state of fever. Of late years the observations of Wunderlich and others on the continent, and of Drs. Parkes and Ringer in this country, have shown the advantage of using the thermometer as a means of investigation in fevers. It has been shown that by making daily observations, characteristic ranges of temperature for different fevers, may be obtained. Thus convinced of the clinical value of the thermometer, I have made systematic observations of the temperature in the accompanying cases.

In typhus fever, the temperature rapidly rises during the first few days, so as to attain its maximum about the third of the fever; it then

begins to fall; and by the time the pulse has attained its maximum frequency, the temperature has fallen about a degree; after this period till convalescence it declines rapidly till convalescence, — ~~and~~ a sudden diminution occurring on certain days. After the subsidence of the fever the temperature is usually a degree or two below that of health (98°.4); but subsequently it may rise a degree or two above the normal temperature.

In a summary of Wunderlich's conclusions, which appeared in Med. Times Sept. 28, 1861, it is stated, — that "the amount of increase of temperature, is usually proportionate to that of the ~~pulse~~ increase of the pulse"; and that when this is not the case it is an exception to the general rule. To this Dr. Aitken (p. 47, Pract. Med.) further adds, that "an increase of temperature of one degree corresponds with an increase of ten beats of the pulse per minute." It will be seen on reference to the accompanying cases of typhus, that the temperature almost invariably attained its maximum a number of days before the pulse attained its maximum frequency, and that about the middle of the fever there was usually a period, during which the temperature was

* See Diagram ~~of the~~ ~~raw~~ representing the ranges in typhus, plac[ed] after Case XIX: also Table and Diagram placed after Case XXIV

declining, but the pulse increasing in frequency. And again at the end of the fever a similar rule prevailed, — the pulse usually continuing to decline for several days after the temperature had reached its minimum.* No opportunity was offered in these cases to ascertain the relation between the pulse and temperature at the outset of the fever; but from analogy we should expect to find that the temperature begins to rise before the pulse. My observations have not been so directed, as to enable me to make any reliable statement, regarding the variations of temperature during each day.

The maximum temperature attained in the different cases, does not appear to have been proportionate to the duration of the fever, or the severity of any of the symptoms. Usually it was from 104°½ to 105°. The highest temperature observed was in Case XVIII, of 12 days' duration, viz 105°·4; and the lowest maximum temperature occurred in Case VII, of 22 days' duration, viz 103°·5. The temperature attained its maximum soon after the appearance of the eruption. At this period also the greatest amount of urea and other solid constituents of the urine were excreted.

When the temperature reached its minimum,

the febrile symptoms had subsided, and at the same time there was usually a marked improvement in the feelings and appearance of the patient. Hence whenever terms having reference to the duration of the fever are employed in these pages, it is always assumed that the day on which the temperature reaches its minimum is the last day of the fever —

The application of cold to the surface of the skin, as by means of the 'wet sheet,' appears to have but a trivial and temporary effect on the range of temperature in fevers. (See the last table in the series)

Circulatory System.

The pulse is generally accelerated from the beginning, and continues to ~~rise~~ increase in frequency, till about the middle of the fever; it then falls rapidly till the beginning of convalescence: at this period it is generally slower than in health. The pulse neither rises nor falls quite regularly. It is particularly liable to oscillate when at its greatest frequency. This is well marked

in Case X, in which on the 10th day, the pulse was 108 per min.; the next day the pulse fell to 60, while the other symptoms were persistent; by the 14th day the pulse had again risen to 112; after this it declined rapidly till convalescence. The pulse was frequently observed to be irregular when of greatest frequency. Irregularity was also observed at the beginning of convalescence in Cases XII and XVII.

A marked fall in the pulse, as well as in the temperature, follows the critical discharges which occur during the subsidence of the fever.

The maximum frequency to which the pulse attained in each case, does not appear to have been in proportion to the duration of the fever, or the severity of any of the symptoms in the case. On the contrary, the accompanying table

Case	XIV	XII	XIX	XV	XI	I	XVIII	XVI	X	XVII	VII	VI
Duration of fever.	14	22	15	18	15	15	12	14	18	12	22	19
Maximum pulse	94	110	119	116	124	130	128	116	112	147	116	154
Minimum pulse	48	48	49	57	58	60	64	66	72	72	80	84
Proportion between Max. & Min. pulse	1·96	2·29	2·43	2·03	2·14	2·16	2·	1·76	1·55	2·04	1·45	1·83
				2·17				1·84			1·64	
								1·87				

× The application of the 'Wet-Sheet' appears to produce a more marked and a more lasting influence on the pulse in fever, than the same means produces on the temperature. (See Conclusions at the end of the last table in the series). Drs Fordyce and Blagden observed that the pulse was also more affected from the temperature by artificial heat. (Watson's Pract. Phys. Vol I, p82)

The quantity of Stimulants ordered daily to each patient, is noted in the last column of each of the typhus cases. It is usually asserted that wine reduces the ~~pulse in fever~~ frequency of the pulse in fever; but I see no evidence in favour of that assertion, in these cases.

shows, that in the majority of cases the maximum number of pulse beats per minute attained during the fever, is nearly double the minimum which occurs after its subsidence. Therefore, if this minimum frequency bear a fixed relation in all cases to the normal frequency in health, we arrive at the highly probable conclusion, that the maximum frequency of pulse attained during the fever will be in proportion to the normal frequency of the pulse in health. However, it is interesting to observe, that as the minimum increases, the relative proportion between the maximum and minimum decreases. For instance, when the minimum was 48, the maximum was a little more than double of 48; whereas when the minimum was 84, the maximum was much less than double of 84. It must be borne in mind, however, that the above data are imperfect; but they are the best furnished by these cases. X (See Third Page)

The pulse becomes weaker, softer, and of less volume, in proportion as it is accelerated: so that during the period when it is most frequent, it may be almost imperceptible. As the pulse falls, it becomes stronger and of better volume. It thus

gradually approaches its normal character towards the beginning of convalescence. A delicate sphygmograph might be used with great advantage to determine the gradual change in the character of the pulse during fever.

Dr. Stokes of Dublin first observed that the cardiac impulse was much impaired in fever, and the systolic sound much enfeebled, so as to become almost inaudible in severe cases. This was observed in Case XII, at the end of the fever, when the pulse was abnormally slow. The pulse, as Dr. Murchison remarks, is not always correspondingly weak or strong. In Case VI, on the 11th day, the pulse was almost imperceptible, but the cardiac sounds were audible and clear.

A degree of softening of the heart's tissue has commonly been observed after death. The microscopical characters of the blood are peculiar in fever: the blood corpuscles have but little tendency to form in rouleaux, and their colouring matter appears disintegrated. The blood is slow to coagulate, and presents an unusually fluid appearance.

Respiratory System.

The respirations soon become accelerated, and attain their maximum frequency at variable periods in different cases; but usually they are most frequent about the middle of the fever. They gradually diminish in frequency as the fever declines, and become normal about the beginning of convalescence.

It is stated, that the expired air contains a diminished quantity of Carbonic acid, and an excessive amount of Ammonia (See Dr. Murchison's work on Continued fever; Resp. Syst.)

The organs of respiration are generally more or less congested or inflamed: hence the frequency of cough and other pulmonary symptoms. Severe pulmonary complications frequently prove fatal. Hypostatic congestion and oedema of the lungs are generally observed after death.

Genito-Urinary System.

The quantity of urine excreted is markedly diminished during the earlier part of the fever; but by the time the pulse has attained its maximum frequency, the excretion of urine has become abundant. As the fever subsides, the urine decreases; but it becomes more abundant again as convalescence advances. Thus on taking averages of the results obtained in six of the accompanying cases, it was found:-that the daily quantity excreted during the period previous to the attainment of the maximum temperature was 41 fl. oz.; previous to the time when the pulse was at its maximum, 48 fl. oz.; subsequently till the end of the fever, 43 fl. oz.; during the first three days of convalescence, 39 fl. oz.; and during the following three days 45 fl. oz.

The urine is of high colour about the time the temperature is highest; afterwards it becomes paler; and towards the end of the fever, and beginning of convalescence, it is often preternaturally pale. At the beginning of the fever the urine is generally of an acid reaction; but as the fever advances, its reaction becomes alkaline,

and its odour pungent or foetid.

The specific gravity of the urine is considerably higher than that of the urine in health, when the temperature is at its maximum; subsequently until a period after the pulse has attained its maximum it decreases, then rises a little towards the end of the fever, but at the beginning of convalescence the density of the urine is less than in health. On taking averages of the results in the table placed after Case XXIV, we obtain the following:— At the period of maximum temperature, the specific gravity of the urine was 1·028; at period of maximum frequency of pulse, 1·022; at a subsequent period 1·019; at period of minimum temperature, 1·020; and subsequently at the beginning of convalescence, 1·018. The changes in the specific gravity are better marked in several of the individual cases; but they are not quite so uniform as the above. The proportion of urea in the urine bears a close correspondence to its density.

The amount of solid constituents of the urine excreted per diem was estimated in the later cases. It was obtained thus.— The last two figures of the specific gravity of the urine, multiplied by 2·33, gave the quantity of solid constituents in a 1000 parts of urine.

Then the amount of solid constituents in the actual quantity of urine passed in the 24 hours, was calculated from the above. The results show, that the daily amount excreted was greatest when the temperature was highest. It then diminished as the fever advanced; so that the least quantity was excreted when the temperature had attained its minimum. It increased again at the beginning of convalescence.

The variations in the daily amount of urea excreted, during the fever, were determined in Case XIX. (Age 15, weight 81 lbs, fever of 15 days' duration).
On the 5th day of the fever, when the temperature had attained its maximum, the quantity of urea excreted in 24 hours was ·902 Oz.; on the 8th day, when pulse of maximum frequency, ·803 Oz.; at the end of the fever, ·544 - ·577 Oz. These are quite accordant with the results of Vogel. (See Neubauer & Vogel on Urine p. 385). He states, that in typhus "during the height of the disease the daily quantity of urea varied between 40 and 50 grammes. As the fever diminished it gradually fell to 20 grammes: and again gradually returned to the normal standard, as the patient recovered." Thus during the earlier part of the fever, when the temperature is highest, the

amount of urea excreted is greater than in health; but as the fever advances it decreases, so as to become less than normal during the latter part of the fever. Subsequently the urea again gradually increases, so as to become normal in quantity during convalescence.

Neubauer (op. cit. p. 25) states, that an increased excretion of uric acid occurs in all febrile states of the body; but its special variations in typhus are not ~~stated~~ given. He also asserts that the hippuric acid is "increased in the acid urine of fever."

Frerichs and Städeler found leucine and tyrosine in the urine of patients suffering from typhus.

During the latter stages of the fever the urine appears to be rich in Carbonate of ammonia; which undoubtedly is in great part the result of decomposition of the urine subsequent to its excretion. However it is uncertain whether there is an excess of ammonia originally excreted.

The proportion of chlorine in the urine was approximatively determined in all my cases, by observing the character of the precipitate thrown down by a solution of nitrate of silver, of uniform strength, — the urine having been previously rendered acid. In this manner the proportion of chlorine was found

to be scarcely diminished during the earlier part of the fever, when the temperature was at its highest point; subsequently it gradually diminished, so as to be generally much diminished about the middle of the fever. In Case XII no trace could be detected for two or three days at this period. Towards the latter end of the fever the quantity of chlorine rapidly increased, and was almost normal at the beginning of convalescence.

Vogel is of opinion that the ~~cause of the~~ great diminution of chlorine in all acute febrile diseases, depends chiefly upon the loss of the appetite, and the tasteless nature of the patients diet; but that in addition to this, there are occasionally abstractions of chlorine from the blood, as in serous diarrhoea, exudations &c - In Case XVIII, a boy, whose appetite was but little impaired throughout, the chlorine was but little diminished at any period of the fever. However, Dr. Buchanan of the Lond. Fever Hospital found the ~~chlorine~~ the quantity of chlorine in the urine of typhus patients diminished, notwithstanding the administration of large quantities of salt by the mouth.

Vogel observed the quantity of sulphuric acid much diminished in most acute febrile diseases; and he thinks

the diminution depended upon the low diet. The statements made as to the variations in the quantity of phosphoric acid in the fever urine are contradictory. The amount of lime and magnesia are very variable.

Usually a sediment is deposited from the urine of fever patients, after a few hours standing. During the earlier part of the fever, when the urine is acid, the sediments consist of amorphous urate. As the fever advances, and the urine becomes alkaline, triple phosphates and amorphous urate, or triple phosphates and phosphate of lime are usually deposited. Globular masses of urate of ammonia, presenting a brown appearance, and clusters of uric acid crystals, are also frequently met with. These deposits generally continue to form during convalescence. Dr. Dyce Duckworth frequently observed a deposit of oxalate of lime in the urine of patients convalescent of fever, in the Clinical Wards, during the winter 1864. A well marked 'oxaluric cloud' was observed in the urine of Case II at the beginning of convalescence. A great quantity of epithelium and mucus corpuscles is also usually observed in the urine of fever patients. The presence of albumen in the urine occasionally was detected for several days during the period when the pulse was high

and the specific gravity of the urine low, in Cases I, V, VI. and VII; and tube casts were observed during the same period in three of these cases. Albumen was present in the urine at the beginning of the fever only, in Case VIII. This case had contracted typhus while convalescent of typhoid fever. In another case who contracted typhus while convalescent of typhoid, attention was first drawn to the patients condition, by observing that his feet were swollen, and that the urine was highly albuminous. He also ultimately recovered of the typhus.

The kidneys after death frequently exhibit evidence of congestive, or even inflammatory change.* The vesical mucous membrane is sometimes found injected after death; and occasionally the bladder is incapable of expelling its contents.

*Previous disease of the kidney often proves a fatal complication. Dr. Murchison states that in one-fourth of the fatal cases there is degeneration of the kidney.

Digestive System.

The tongue, like other organs, appears to undergo changes according to the stage of the fever. During the earlier part it is large, moist, of a pale red colour anteriorly, and at the edges, and coved with white fur dorsally. As the fever advances the fur becomes thicker, and of a yellowish-brown or brownish colour. Ultimately in the great proportion of cases, the organ becomes coated with a dark, thick, dry and fissured crust, - consisting of desiccated epithelial debris. The lips also become parched and the mouth dry. The tongue seldom becomes dry before the pulse has commenced to fall. During the last day or two of the fever, it clears up, and becomes moist. The tongue is often preternaturally clean at the beginning of convalescence; but as convalescence advances, it may become slightly furred. An appearance of the tongue which is said to characterize Scarlatina occurred in Cases IV and XI, - both being boys. The organ was covered with white fur; but large red papillae were also to be seen. In mild cases the tongue may be protruded equally throughout, as in Cases II & III. When the nervous symptoms are severe, the tongue becomes very tremulous, and the patient is incapable of protruding it.

·x· Vomiting occurred in three of the four female cases: viz. in Cases ii. vi, and viii. This symptom ~~did~~ was not present in Case xvii, (aetat. 12), nor in any of the male cases.

Great thirst invariably occurs, and a great quantity of water is usually taken; — especially during the earlier part of the fever. An impaired appetite and perverted taste are frequently the first symptoms which appear; but in some cases the appetite may be retained for a day or two subsequent to the rigors. In most of the accompanying cases the patients began to take more food two or three days before the minimum temperature was attained: although the patients themselves often denied that the appetite was improving. The patient's appetite had been restored some days before he was able to distinguish between his medicine and his ~~food~~ wine. In Case XVIII the appetite was scarcely impaired throughout the fever. ~~Dr. Brinton is of opinion~~ Dr. Brinton directs attention to the probability of the mucous membrane of the stomach being congested or inflamed, in fever, and thus incapable of performing its function. X (Dr. Brinton on Diseases of the Stomach)

The action of the bowels, in typhus, is very irregular. Constipation may persist for several days, then diarrhœa may set in for a day or two, to be again followed by constipation or irregular action. In Case XIV, in which the fever was of a mild character, and of 14 days' duration, there was no action of the

bowels from the 4th to the 15th day. Dr. Murchison, after calculating from extensive statistics, found that diarrhoea occurred in about 10 per cent. of cases. More or less diarrhoea occurred in 9 out of the 19 accompanying cases. It ~~only occurred~~ appeared only after the pulse had commenced to decline in 5 of these cases; but occurred both before and after this period in 4 cases. Hence it may be said that diarrhoea most commonly occurs when the fever is subsiding. The stools are sometimes of a yellowish-brown colour, at other times of a dark brown colour. Involuntary evacuation of the bowels was only observed in Cases V and X - in both of which the nervous symptoms were of a severe character. Lesion of the alimentary canal has rarely been observed after death as a result of typhus. The liver and spleen become enlarged and congested in a considerable proportion of cases.

Nervous System.

Usually the first distressing symptom of the patient is a frontal headache. This is accompanied, in most cases, by muscular pains in different parts of the body, and abdominal pain or tenderness on

pressure. The mental faculties are more or less impaired in the majority of cases. Of 90 cases investigated by Dr. Murchison, he found impairment of the mental faculties in 80 per cent., and actual delirium in 55 per cent.

During the earlier part of the fever, the intelligence is confused and blunted. The patient may at first manifest a degree of anxiety and attention; but as the disease advances, he becomes daily more indifferent with regard to himself and all around him, and wishes not to be disturbed. His memory soon becomes markedly impaired: he is unable to know the day of the week, or when some friend visited him last. There is restlessness and disturbed sleep at night, – the patient generally denying that he has slept ~~at~~ at all. Perhaps I can best illustrate this subject by describing my own feelings during an attack of typhus. – On awaking one morning, after an unusually long sleep, I experienced a dull pain in the forehead, which made me so miserable that I was unable to enjoy anything. I felt cold and chilly, and had a feeling as of fatigue in the lumbar region, so that I soon got tired of sitting. Respiration was also tiresome. In the course of four days

* Dr. Handfield Jones in his recent work on Nervous Disorders states, that "in all the different varieties of nocturnal exacerbations of disease, the ~~lesions~~ morbid causes remain the same, but the nerve power is feeble and less capable of withstanding ~~it~~ them."

I felt very prostrated and strange, and saw things dimly on the street. I remember trying to read two books at that time, — the one being critical and philosophical in its style, the other descriptive and simple. I found the former most mysterious, and was quite unable to understand it; but the latter I could comprehend. And again during convalescence, I was for a long time before I could read the former, though I afterwards far preferred it to the simple book. For the first two or three days I watched the symptoms with interest; but soon was unable to count my pulse, and became quite indifferent with regard to everything. After the fever was over I had very little recollection of what had passed, although I never was truly delirious except at nights.

At the more advanced stage of the disease, the headache, which more or less prevailed during the earlier part, disappears; and delirium may set in, especially at night. × The delirium varies much in character in different individuals, from mere incoherent muttering to the acute and most noisy delirium. This latter is rare, in which the patient actuated by some strange delusion is apt to leave bed,

and occasionally to display a wonderful amount of agility and muscular power. It is not uncommon for the patient to imagine himself that he is two or more individuals. This kind of delirium was well marked in Case I. (See report March. 27.)

In another case, which occurred in ward IX of the Royal Infirmary this winter, the patient, having got out of bed and got hold of a knife, ~~was~~ chased ~~to~~ the night nurse down several flights of stairs, so that it was necessary to have the assistance of several men to secure him in his bed again.

Several ~~instances~~ of interesting instances of delusions occurring in fever are given in Dr. Munchison's work on Continued fever.

This state of apparent excitement of the mental faculties is followed towards the latter end of the fever by stupor and drowsiness, and even by coma in ~~some severe~~ rare cases. A patient frequently expresses himself much better after a long sleep. Case IV appeared to sleep throughout the fever, there being no delirium. Coma vigil rarely occurs except in fatal cases. Convulsions are also a fatal complication. Dr. ~~is opinion~~ Munchison is of opinion that convulsions in typhus are generally dependent on uraemia arising from

~~&~~ retention of urea in the blood:—there being organic disease of the kidney in most of the cases.

The muscular power is markedly diminished from the beginning, and the patient soon becomes unable to stand. Paralysis has been occasionally observed. Tremors and twitchings of the muscles are exceedingly common. The muscular tissue is generally found after death to have undergone partial fatty degeneration. This was well marked in a ~~case of typhoid~~ a fatal case of typhoid recently under the care of Professor Laycock.

Common sensibility is markedly impaired. The sense of taste is perverted from an early period. Impairment of the sense of hearing frequently occurs, and unusual noises in the ears are heard. Deafness is generally regarded as a more favourable symptom than acute hearing. The sense of sight is also impaired, and optical illusions occur in some cases. The pupils were specially observed in my later cases. They were found to be markedly contracted in several of the cases, especially at the time when the delirium was at its height, but the pupils were not appreciably contracted at any period of the fever in Cases XI. XII. XVIII. and XIX. in neither of which

X. The severity of the nervous symptoms in different cases does not appear to be in proportion to the severity of the other symptoms present; nor is the length of time during which delirium continues in proportion to the actual duration of the fever.

After death the membranes of the brain have been found congested in many cases; but they rarely indicate that there has been inflammation going on, so as to account in this way for the delirium.

X

there was any delirium. In Cases XIII and XVII, both of which had recently recovered from typhoid fever, the pupils were observed to be occasionally dilated. In certain severe cases the pupils became insensible to light. X

The nervous system is not perfectly restored for sometime after the fever. During convalescence the gait is usually unsteady, and drowsiness is readily induced, especially by smoking. The convalescent from fever is also liable to get confused and giddy in strange and spacious places, especially if he endeavour to observe the different objects around him. Dementia sometimes occurs as a sequela. The right ear suppurated during convalescence in Case X.

General Remarks on and Sequence of Morbid Phenomena.

Having thus endeavoured to trace in detail the changes which the different physiological systems appear to undergo during the course of the fever, I shall now proceed to take a general view of the symptoms, and consider the order in which

the various phenomena appear. We have seen that the temperature rises, and that the pulse-beats and respirations increase in frequency, up to a certain point. Then they subsequently decline until the fever has subsided. These numerical variations may be taken as the type of more obscure changes. Each symptom appears to increase in severity up to a certain period of the fever, and subsequently to subside gradually until convalescence is established. But the individual symptoms attain their greatest severity at different periods of the fever. However, the relative order in which these periods succeed one another appears to be almost invariable in different cases. So that we have thus landmarks during the course of the disease, the recognition of which will enable the physician to understand the stage at which the disease has arrived in a given case.

~~The following appears to me to be~~

It appears to me, that the sequence of the morbid phenomena, as they appear during the fever, is as follows.— 1. The rigors. 2. Appearance of the eruption. 3 Temperature at its maximum; urine most scanty and of greatest density; and largest amount of urea excreted. 4 Respirations of maximum

frequency. 5. Pulse-beats of maximum frequency. 6. Delirium at its height (if present); urine of least density; tongue most apt to become dry; and critical discharges most liable to occur. 7. Minimum temperature; least amount of urea excreted; and all febrile symptoms subsided.

It has been already stated with regard to the eruption, (p.9), that when it was very copious and marked, it ~~appeared~~ seemed to have a tendency to appear comparatively early, and remain persistent till a late period. It appears probable, that a similar rule holds true in the case of delirium and the condition of the tongue. When delirium comes on early as complicating with other symptoms in the fever, it may be expected to become severe and long continued.

Prognosis.

The average duration of typhus, as ascertained from extensive statistics, is said to be 14 or 15 days. However the duration of individual cases varies much from this standard. Thus in my own cases, (assuming the ~~temperature~~ day on which the temperature reached its minimum to be the last day of the fever), ~~two~~

11 out of 18 cases after 14th day –

1 Case was convalescent on the 9th day,
1 " " 10th "
2 " " 12th "
3 " " 14th "
4 " " 15th "
1 " " 16th or 17th "
2 " " 18th "
1 " " 19th "
1 " " 20th to 22d "
2 " " 22d "

The mean average duration in the 18 cases is ~~16.5~~ 14.6 days. It is of great importance that the physician should be able to predict the probable duration of such a formidable disease as typhus, the duration of which is so variable. From the time of Galen until the present day, it has been a common belief in the medical profession, that fevers usually ~~terminate~~ terminate on ~~the~~ or some of the 'critical days' viz. 9th, 11th, 14th, 17 or 21st day; that, for instance, if a case of typhus is not convalescent on the 14th day, it will probably run on to the 17th or 21st day. It is further alleged that some marked changes in the course of the fever usually occur on the critical days. However, on reviewing my own cases with regard to this point, I have been

Dr. Ruiger is of opinion that the cycles are not necessarily of 5 days' duration in all cases; but that the cycles may be of different duration in different individuals.

unable to find any evidence in favour of this doctrine. Dr. Murchison states, that "his observations lend no support to the applicability to typhus of Galen's doctrine of critical days." Dr. Ringer, of University College, has lately propounded a new theory of periodicity in fevers. Having come to the conclusion, (in the case of scarlet fever) that "in the large proportion of cases the temperature falls on the fifth, tenth, fifteenth, or twentieth day, that is, either on the fifth or a multiple of the fifth day of the disease"---; he afterwards adds:— "We have seen that in fevers the temperature forms cycles, and as the variations in the temperature are due to variations in the amount of tissue-change, it follows that we must have a cycle of tissue-change. Does such a cycle exist in health? I think it probable, and that this determines the cycle in fever, and not the disease itself." He then proceeds to prove his proposition from his very excellent observations, to which I beg to refer the reader. (Trans. Med. Chir. Soc. Lond. Vol XLV p. 111.)

Not being satisfied that the above doctrine was quite applicable to the ranges of temperature in his own cases, I took an average of the first morning and last evening observation for each day, in four of his uncomplicated cases, viz.

Cases 5, 6, 16. and 22., and arranged the results so that the proposition may be fairly tested. (See last table but one in series) It will be seen, that in Case 6, the temperature is lowest on the 5th, 10th, and the 15th days, after the last of which the patient was convalescent. So this Case favours Dr. Ringer's doctrine. But the other three cases do not appear to lend any support to it. On reviewing his ~~other cases~~ as numerous other cases as they stand, they do not appear to me to be more favourable.

I should never have had the presumption here to criticise the doctrines advanced in Dr. Ringer's ingenious paper, had they not been inconsistent with the conclusions to which I have ~~been~~ been led from the accompanying cases of typhus. I now beg to refer the reader to the table placed after Case XXIV, and the subjacent diagram. There I have taken averages of the daily observations of the pulse beats, temperature, respirations, and the specific gravity of the urine, in 2 cases of 12 days'; 3 cases of 14 days'; 3 cases of 15 days'; 3 cases of 18 days' (amongst the latter is included Case VI, of 19 days' duration), and 2 cases of 22 days' duration. This table includes all the cases which were applicable for this inquiry. The results were not noted in the table on days when obser-

ations had been made in only one of the cases. The table shows that the pulse and temperature began to fall early in cases of short duration, but not till a late period in cases of long duration. The ranges of the respirations and specific gravity of the urine were are not quite so uniform as those of the pulse and temperature.

The pulse in cases —

of 12 days' duration attained its maximum at $\frac{3}{12}$ths or .25 of fever.
" 14 " " " $\frac{6}{14}$ths or .43 " "
" 15 " " " $\frac{9}{15}$ths or .60 " "
" 18 " " " $\frac{10}{18}$th or .56 " "
" 22 " " " $\frac{13}{22}$nd or .60 " "

On taking the mean average of the last column, we get .54.
On an average, therefore, the pulse attains its maximum about one-half of the fever. However, in cases of 12 days' duration the pulse attained its maximum about ~~the fourth the fever~~ $\frac{1}{4}$th of the ~~fever~~ whole duration of the fever, i.e before one-half the fever. Whereas in cases of 15-22 days' duration, not till $\frac{3}{5}$ths of the fever, i.e. later than one-half of the fever.

The temperature in cases —

of 12 days' duration attained its maximum at $\frac{3}{12}$ths or .25 of fever.
" 14 " " " $\frac{5}{14}$ths or .36 " "
" 15 " " " $\frac{6}{15}$ths or .40 " "
" 18 " " " $\frac{6}{18}$ths or .33 " "
" 22 " " " $\frac{9}{22}$nd or .41 " "

On taking the mean of the last column, we get ·35. Consequently on an average the temperature attains its maximum about 1/3rd of the fever; but in cases of 12 days' duration the temperature attained its maximum about 1/4th of the fever; and in cases of 15–22 days' duration, not until ~~nearly 1/2 the fever~~. 2/5ths of the whole duration of the fever. It has already been shown how the eruption appeared early in cases of short duration, but not till a comparatively late period in cases which were prolonged. (See p. 9)

It will be seen that the cases, in which the fever proved to be of long duration, did not come under observation until about a week had elapsed: so that the table is most incomplete in these cases. But this in itself is a strong evidence in favour of my proposition. In the cases, in which the fever was of short duration, the patients were early prostrated, and sought admission into the hospital at an early period in consequence; whereas, in cases of long duration, the patients had not become sufficiently ill to attract attention until several days had elapsed.

This law, (as I venture to call it), holds wonderfully true in the individual cases; but there are two exceptions, which are included in the averages

in the table. viz Case XVII, in which the pulse and temperature continued to rise till a late period, although the fever proved of short duration; and Case VI. in which the temperature attained its maximum comparatively early, although the fever was prolonged till the 19th day. It is probable that the more completely and accurately the phenomena of fever are investigated, the more clearly the above law will be understood. But even as it is, I have found it practically useful. Thus in Case XVIII, when the eruption was observed as early as the 3d day, and the pulse and temperature to commence to decline on the 4th, a fever of short duration was anticipated. In Case IX, it was clear that the patient had arrived at the most critical period of the fever, on the day he died, viz. just before the pulse had reached its maximum. It is of great importance that the physician should be able to come to a conclusion as to what stage of the fever a given case has arrived, as the patient himself is often unable to furnish any information. When the pulse is found to begin to decline, though the delirium be at its height, and the tongue dry, a speedy recovery may be expected, as occurred in Case VIII on admission. Again, when the pulse and temperature are found to rise,

*.

The reports of cases of fever are expressed so briefly and significantly by means of the ranges of the pulse, temperature – that a physician in England, to whom the observations of a case on the continent are telegraphed daily, may be almost as capable to form an opinion with regard to the progress of the case, as the physician in immediate charge of it.

†. More than one-third of the cases were already under treatment in the Royal Infirmary when they contracted typhus – Three of these cases were under the treatment of Dr Laycock in a mixed ward – being cases of Hemiplegia, Skin disease, and Dysmenorrhoea respectively. The four remaining cases contracted typhus in the Fever Ward – two being convalescent from typhoid – one from scarlet fever, and one from pneumonia –

after a decided fall has once occurred, some change for the worse may be expected. In one case of this kind I was led to the discovery that the patient's bladder was distended. When the urine was drawn away, the symptoms at once improved, but otherwise the patient would have probably perished before morning. ×

I would here remark also that when such symptoms as delirium make their appearance comparatively early in the fever, they may be expected to prove severe and long continued.

Dr. Murchison states, that the mortality among the typhus patients in the London Fever Hospital, a great proportion of whom are of broken down constitution, amounts to 20 per cent. Of the 19 accompanying cases, only one proved fatal. (*See opposite) ~~One-fourth of them were already under treatment, when they contracted the fever. Two were convalescents from typhoid, and one was from scarlet fever, and one was a hemiplegiac.~~ Children usually sustain an attack more successfully than those who have reached old age. The stronger and healthier the constitution, the more favorable the prognosis. Those who have been exhausted by bodily or mental fatigue, deficient nourishment, impure air, dissipation or a chronic disease, stand

+ According to Murchison Typhoid also occurs in groups in consequence of putrid local emanations –

a poor chance of recovery.

Death usually occurs by coma; but in some cases the patient becomes asphyxiated from engorgement of the lungs, or dies from syncope—

Diagnosis.

The disease with which typhus is most liable to be confounded is <u>typhoid fever</u>; therefore I shall confine the following remarks chiefly to the consideration of the distinction between these two diseases.

1. Dr. W. T. Gairdner has lately shown (See Clinical Lectures) how cases of typhus have a tendency to occur in groups, from the contagious nature of the disease; whereas typhoid cases are isolated, and appear to have no connection with one another. All the accompanying cases of typhus could be traced to other cases of the disease. The fever was either contracted in the Infirmary, or a history of proximity to other cases of fever out of doors could be ascertained. In one case only was there any obscurity as to the origin of the fever (See Case V.)

Typhoid fever is never known to spread in this manner: Hence we have here a marked difference in the mode of origin of the two fevers.

2. Their general character as regards duration, and the degree of prostration present is also different. It is rare for typhus to be prolonged beyond three weeks; whereas typhoid fever almost invariably exceeds this duration. In typhus the patient is rapidly prostrated, and the prostration continues until the fever has absolutely subsided. The typhoid patient, on the other hand, is not as a general rule so much prostrated. Case XXI (typhoid) was only kept in bed by force. He felt quite well, when the temperature and pulse indicated that the fever was at its height. In another case of typhoid fever which I have observed, but which is not appended, the patient not only left bed, but even felt sufficiently well to leave the Infirmary, when the temperature was several degrees above the normal standard. I have known one case of typhoid fever insist upon leaving bed before the intelligence was perfectly restored. The majority of the accompanying cases of typhus ~~remained in bed for several da~~ were unable to leave bed for several days after the temperature had become normal.

3. We have seen that in typhus the countenance is dusky, and the expression stupid. The typhoid patient presents an emaciated countenance, with a circumscribed flush on either cheek, and a peculiar languid expression. In the latter also the pupils are generally dilated; thus contrasting with the more or less contracted state of the pupils which usually occurs in typhus.

4. The eruption of typhoid fever is more scanty and less distinct than that of typhus; and it usually appears later. Several series of rose-coloured spots appear, but the individual spots only remain visible for two or three days. The spots are not persistent as they are in typhus.

5. Iliac tenderness, diarrhoea with yellow-ochre coloured stool, abdominal tympanites, and occasionally intestinal haemorrhage, are symptoms which characterize typhoid fever. With the exception of diarrhoea, these symptoms are exceedingly rare in typhus.

After death from typhoid fever, the glands of Peyer, and the mesenteric glands, are found to have undergone pathological changes which are peculiar to this disease; and so all doubts in the diagnosis during life are finally settled by the post mortem examination. To Dr. W. Jenner belongs the merit

of establishing the essential difference between these diseases.

However, notwithstanding all the features of distinction above enumerated, the diagnosis between typhus and typhoid fevers, during life, is often attended with difficulty; and when the eruption is absent, the highest authorities assert that the diagnosis is uncertain. It is highly desirable, therefore, that the physician should have some additional means which may aid him to distinguish between these fevers. We have seen, that the ranges of the pulse, temperature, respirations, and of the specific gravity of the urine, have a definite character in typhus fever. It would appear from the two cases of typhoid fever appended, (XX & XXI) that the ranges have a different character in that disease. The temperature, for instance, instead of rising ~~uniformly~~ uniformly to a certain point, and then declining, presents, in the two cases of typhoid, changes which are peculiar to these cases. Remarkable oscillations in the range of temperature, as well as in those of the pulse and respiration, occur, which are not apparent in the typhus cases. This peculiar character of the ranges in typhoid, as distinguished from the ranges in typhus, indicates in a very marked manner, that there is an essential

× See Summary of Wunderlich's conclusion and others referred to at p. 12. Previous observers have also ignored the influence which the duration of the fever has on the causes in typhus - ~~a fact which has been~~ to point out to which influence it has been one of the chief objects ~~of this to demonstrate~~ of demonstration in this Thesis. ~~(T.S.)~~

Why are not Wunderlich's researches referred to, who first pointed out to these changes of temperature as symptom etc & diagnostic? - In what do the Author's views differ from his?

D H B

difference between the symptoms of the two diseases. Hitherto attention appears to have been chiefly confined to the range of the temperature; but the two accompanying cases show that the ranges of the pulse and respiration are equally characteristic. ~~There is more or less correspondence between the different ranges.~~ I would here beg to direct attention to the analogy between the oscillating character of the ranges and the alternative appearance and disappearance of the spots of the eruption in typhoid fever. And it is interesting to observe that the class of poisons, whose effects most resemble the symptoms of typhoid fever, viz. the Solanaceæ — Belladonna, Hyoscyamus, and Stramonium, produce nervous symptoms of a remittent character, — coma and delirium alternating.

It is seldom difficult to distinguish between typhus and <u>Scarlet fever</u> or <u>Measles</u>. However the appended Cases show that the ranges have a peculiar character in these diseases also. In Scarlet fever, the pulse and temperature generally decline after the 2d or 3d day. (See Cases XXII & XXIII). But the specific gravity of the urine persists high till a late period; ultimately it falls as in typhus; and at this period albumen was detected in the urine of one of the Cases. In the Case of Measles, (Case XXIV) the ranges

~~the did not appear~~ do not appear to have commenced to fall till the 5th or 6th day.

Typhus is frequently complicated by latent pneumonia of the apex of the lung, uraemia, pneumonia, relapsing fever &c. but having nothing new to suggest, I beg to leave the subject to more experienced hands.

Pathology

In the following remarks on the pathology of typhus fever, I shall endeavour to explain some of the complex phenomena already considered, by the aid of the modification of Virchow's theory of fever, advanced by Dr. Parkes in his Gulstonian lectures before the Royal College of Physicians, London, in 1855. Of which Dr. Jenner remarks in a masterly review of it, (Brit & For. Med-Chir. Rev. Vol. XVII, p. 390) that "a more consistent theory of fever, one so largely supported by facts, has not hitherto been placed before the profession."

Virchow defines fever as "consisting essentially in

Elevation of temperature, which must arise from an increased consumption of tissue, and appears to have its immediate cause in alteration of the nervous system." But Dr. Parkes remarks.- "First of all, we must place the entrance into the blood of the morbific agent, and the alteration of the blood, to a certain extent, under its influence. Perhaps this occurs during the incubative period, when often there is no rise of temperature, no fever, that is, no appreciable alteration of the general health can be discovered. The nature of the change in the blood is unknown."

In the case of typhus, it is a well established fact that febrile symptoms are not usually manifested, until a period of about nine days has elapsed. And the fact that a single case of fever may communicate the disease to several others, and that the fever may thus spread through a whole community from a single centre, evidently shows that the fever inducing agent is multiplied in its course through the system. Hence it is natural to infer, that one of the changes which occur in the blood during the incubative period, is an increased development of the fever poison. That the blood as a whole undergoes change during this period, as Drs. Parkes and Jenner appear to think, has not yet been de-

* See Dr. Ringer's Observations on Ague. Trans. Med. Chir. Soc. Lond. Vol XLII. pp. 369 & 371.

monstrated. It is only known that after the fever has been established, the blood has been undergone alteration both in microscopical characters and chemical composition.

The first marked symptoms of fever which appear, such as — rigors, headache, and neuralgic pains, prostration and blunted intellect, point to disturbance in the nervous system. although it has been demonstrated that an elevation of temperature, and increased elimination of urea, precede the cold stage in ague, still even these phenomena may be traced back to change in that part of the nervous system presiding over nutrition.

"Simultaneously" (with these nervous symptoms) Dr. Parkes continues, "various parts, especially the muscles, and probably some of the organs, deprived in greater or less degree of nervous influence, begin to disintegrate, and by their disintegration produce preternatural heat. This metamorphosis is aided in most cases, by the condition of the vagus and vaso motor nerves which cause increased action of the heart and dilatation of the vessels."

We have seen, that in by phus a greater amount of urea and other constituents of the urine (including chlorine salts)

See pp. 19. 20, 21.

is excreted during the earlier part than at any other period of the fever.* Dr. Ringer clearly shows, that during a corresponding period in scarlet fever the amount of urea excreted was not greater, but even less than the amount excreted by the same cases during convalescence. (Trans. Med. Chir Soc. Lond. Vol. XLV, p. 111.). But we must take into consideration that scarcely any food is taken during the fever. We will suppose that in a given case 40 fl. Oz. of beef-tea, 20 fl. Oz. of milk, and 2 Oz. of bread are taken per diem. This quantity, (which is certainly larger than what is usually taken by the fever patient), will yield according to Professor Christison's tables, only 3·8 Oz of solid nutriment.— a quantity barely equivalent to a quarter of a pound of beef-steak, according to the same author. The observations of O. v. Voit (See Neubauer & Vogel on Urine, p. 381) show that the daily quantity of urea excreted by him in health while living on

purely animal diet was ..... 51-92 grammes
mixed ..... " ..... 36-38 "
vegetable ..... " ..... 24-28 "
non-nitrogenous ..... " ..... 16 "

On reference to page 385 of the same work, we find

that in a case of typhus at the height of the disease, the daily quantity of urea varied between 45 and 55 grammes. That is, rather more than what is excreted by a healthy person while living on mixed diet, notwithstanding that the fever patient is on the low diet already considered. ~~And~~ Therefore although the amount of urea excreted during fever be less than what is excreted by the same patient during convalescence, — when an extraordinary quantity of food is usually taken, still if it exceed that excreted by a convalescent on an equally low diet with the fever patient, there will be an excessive urea-excretion during the fever; which under the circumstances must arise from excessive waste of the nitrogenous tissues. Not only does the urinary excretion show evidence of excessive waste of the nitrogenous tissues, but these tissues themselves are found after death to have undergone a fatty degeneration.

At a more advanced stage of the fever the amount of solid constituents of the urine become markedly diminished. Undoubtedly this is in part due to the metamorphosis of tissue becoming gradually less active; but it is also probable that the excreting power of the kidney becomes impaired

Turn over

* The condition of the blood after death is what might have been almost anticipated from the symptoms: it has been found to present an unusually fluid appearance, to be deficient in fibrine, and to have but little tendency to coagulate. Dr Christison ~~has~~ detected urea in the blood, even when the kidneys were healthy. The composition of the blood probably varies considerably during the different stages of the fever.

at a certain stage of the fever. For, subsequent to the period at which the pulse reaches its maximum, the specific gravity of the urine becomes much diminished, and the presence of albumen, in the urine, was observed at the same period in several of the cases. Precisely the same conditions were observed in the scarlet fever cases at a comparatively late period. (See Cases xxii & xxiii)

It is said that the excretion of carbonic acid by the lungs is diminished in fever. During the earlier part, when the respirations are accelerated, the strength of the patient but little impaired, and the lungs not congested, it is scarcely possible to imagine that less carbonic acid is excreted: but at a more advanced period of the disease, the functions of the lungs, like that of all other organs, become much impaired. The skin is known to be dry throughout, except when critical ~~discharges~~ sweats occur. But the quantity of water excreted by the kidneys is also scanty during the earlier part of the fever, notwithstanding that the solid constituents are excreted in increased quantities. From analogy, therefore, we should expect to find that the excretion of the skin is deranged affected. x

The variations in the range of temperature bears

a close correspondence to the variations in the degree of waste of tissues, as indicated by the excretion. ~~But the average temperature during the latter half of the fever is less~~ But the average quantity of solid constituents excreted by the kidneys during the latter half of the fever is less than the amount excreted in health; ~~but~~ the average temperature during the same period is above the standard of health. ~~We have also already seen that Dr. Ringer found his scarlatina cases excreting more urea during the convalescence than at any period of the fever.~~ Dr. Parkes concludes that when there is diminished elimination and an elevated temperature, there must be retention of the products of metamorphosis in the blood. (op. cit.) He shows that the system rids itself of the retained products by critical discharges; and that when critical discharges do not occur, inflammatory complications are liable to set in. But it seems to me that if the whole excretions during the fever were collected, we should find them less in amount than the excretions in health during a similar period. We have already seen that Dr. Ringer found his scarlet fever cases excreting more urea during convalescence than at any period of the fever. (p. 51)

* The weights of the patients were ascertained in the later cases: first, when the patients came under observation; next, when the temperature reached its minimum; and subsequently during convalescence. The weight lost during the fever varied in different cases from $\frac{1}{16}$th to $\frac{1}{7}$th of the weight on admission. Usually the patients did not begin to increase in weight for the first two or three days of convalescence. In two cases, the amount lost during the fever had been regained in a fortnight after the subsidence of the fever; in another case, only $\frac{1}{3}^{d}$ of the weight lost during the fever had been regained in the same period.

(See last columns in Cases XIV–XIX)

Brown Séquard

Why, then, should the temperature in fever be above that in health? The excretions in fever must be derived almost exclusively from waste of unrepaired tissues; and it is probable that the tissues as a whole undergo retrograde metamorphosis; which is indicated in part only by the excretions, for we find that the tissues have undergone degeneration in structure. This is the only explanation I can offer of the above apparent anomaly. ×

Virchow and Parker consider that the symptoms of fever arise from withdrawal of nervous influence from the tissues. C. Bernard found that division of the sympathetic in the neck, caused on the same side, hyperaemia, contracted pupil, and an elevation of temperature to as much as 11°. Weber again observed that if the end of the divided sympathetic was galvanized, all the above effects disappeared, and were replaced by the converse. It was further observed that division of the vagus was followed by increased rapidity of the heart's action; and the transmission of an electric current through the cut nerve by diminished rapidity of the heart's action. Accordingly we should expect to find that paresis of the above nerves, however induced, would

be followed by dilatation of vessels, increased rapidity of the heart's action, elevation of temperature, and contracted pupils. Moreover, Further, dilatation of the vessels would be necessarily accompanied by an influx of fluid into their cavity. Dilatation of the vessels without an increase in the volume of the contained fluid would be a physical impossibility; and vice versâ.

The fact that the above symptoms occur in fever, makes it highly probable that fever is caused in a similar way. The symptoms of fever viewed in this manner appear quite intelligible. The tissues, deprived of their usual nervous influence, lose their power of repair, fall a prey to the physical laws, and disintegrate, with ~~increased~~ increased production of heat and excretion. We have also the general hyperæmia and accelerated pulse, anorexia, thirst, and scantiness of water in the excretions, arising from a degree of the paralysis of the vagus and sympathetic.

A great quantity of water is drunk during the earlier part of the fever; but there is less excreted than at any period of the disease. Consequently the water must be retained in the system at this period. Dr. Parkes is of opinion that the retention of water in fever is caused by the presence in the blood of some

× In three cases of Diabetes Mellitus, which I reported while Clinical Clerk under Prof Bennett, during the summer of 1884, the quantity of water drunk and urine excreted by the patients, varied according to the amount of sugar excreted by the kidneys. Thus in one of the cases, when on ordinary diet, and 22.7 oz of sugar were excreted daily, the ~~quantity of water drunk~~ actual quantity of water taken daily was 473 fl. oz. and the daily quantity of urine passed was 462 fl. oz. When the patient was put on an animal diet, and only 7.4 oz of sugar were daily excreted, the daily amount of water ~~drunk~~ taken fell to 107 fl. oz., and the amount of urine passed fell to ~~124 oz.~~ 125 fl. oz. When the patient was again put on ordinary diet, and the sugar increased to the same amount as it was originally, the water taken and excreted increased in a corresponding degree -

(See Prof. Bennett's Work on Clinical Medicine, fourth Edition, pp. 915. 916. 917.).

products of metamorphosis having a powerful attraction for water. If this hypothesis be correct, then the dilatation of the vessels must be a consequence of an increased influx of water into the vascular system, and not a direct effect of the paralysis of the sympathetic: which is contrary to Dr. Parkes' own theory of fever – × (See p. 50)

In typhus, not only the nervous centres regulating nutrition, but the nervous system as a whole is affected. Thus, common sensibility and the special senses are markedly impaired. The power of motion also is enfeebled; and the intelligence is more or less affected in the majority of cases. It is usually stated that the mental faculties are first of all excited, and afterwards depressed: active delirium is followed by stupor or coma. An analogy is thus drawn between the nervous symptoms observed in fever, and the effects of the narcotics, as alcohol and opium; in which also a period of excitement is said to be followed by one of depression. Does the so called excitement arise from increased nervous force? Is it not more probable that the excitement of a person under the influence of alcohol arises from suppression of the higher faculties of the mind, so that the inferior faculties are thus left

It is a symptom of exhaustion —

uncontrolled. Than from really increased nervous force? An intoxicated person will perform a feat, which he would not have attempted while sober, not because he is more capable, but because he is more blind to the difficulties & consequences involved.

In the same manner, the imagination is often preternaturally active just before sleep comes on, and brilliant ideas pass through the mind in rapid succession; next follow dreams; and lastly sound sleep. When all the faculties have been restored next morning, and the mind well balanced, the ideas, which appeared so brilliant the previous night, are rejected as mere chimeras. Ought we not to explain the wild delusions and apparent excitement, which occur in fever and as effects of the narcotics, in a similar manner? It appears inconsistent to suppose that the intellectual faculties alone should be excited, while all other functions of the nervous system are paralysed.

We have seen that the height to which the pulse rises in different cases appears to be proportionate to the frequency of the pulse in health. (p. 216) If this be true, then it will appear probable, that the severity of the symptoms presented by any one of the physiological systems during the fever

The account of Pathology given has little to do with the so called pathology of Virchow – which in fact owes its origin to Bernard –

depends upon the state of that system in health. ~~For instance~~ The character of the delirium, for instance, will depend upon the mental constitution of the patient; and so with regard to any of the other symptoms.

It has been already shown (cf. pp. 5 & 39) that the ~~character~~ earlier the eruption made its appearance, and the earlier the pulse, temperature &c., reached their maxima, the shorter was the duration of the fever. Consequently the length of time any case continues, is not a matter of accident, but appears to be predetermined from the beginning of the fever – at least as early as the appearance of the eruption. It will be seen on reference to table placed after Case XXIV, that the length at which the pulse-range must have originally risen in the different cases, diminished in proportion to the duration of the fever. It has been repeatedly shown that the severity of the symptoms bear no relation to the duration of the fever. Consequently we must suppose that the fever takes a variable length of time to attain the ~~same~~ same severity in different cases: in the same manner as one class of intellect can exhaust its energies on a certain subject in half the time required by another class of intellect, of equal capacity, on the same subject.

Appendix
Reports of Cases &c—.

Reports of Five Cases of Typhus Fever.

Case I.

Typhus occurring in a young man, convalescent on the 15th day. Marked delirium.

Donald F—, aet. 26, a joiner, resident at 18 Bristo Street. Admitted to Royal Infirmary under care of Dr. Laycock, 11th March 1864.

Antecedent History.

He states he has enjoyed good health through his life, and is not aware that he has ever contracted fever.

A fortnight previous to admission this time, he was dismissed from Ward IX, which is a fever ward: his complaint then being pneumonia. After having been under treatment for about nine days, he left from extreme dread of the fever. The patient occupying the next bed to his, was a convalescent from fever, and also the boy who brought him his food.

During the interval he has been out of the Infirmary, his health has not been good. His face was pale, he saw things dimly, felt stupid, and was indisposed to take up his work again.

On Monday, 7th March, he first felt really ill. He was pretty well during the day; but that night

on going to bed, he experienced a chilliness and shivering; and had a dull, stupifying, frontal headache. He slept well that night, and took little breakfast next morning; but was unable to go to his work. From that day till admission he has had no appetite, and has felt himself daily getting worse. He has had no pain in the loins, but a little in the back, especially between the shoulders.

A well marked eruption was observed on the day of admission. That night, the patient at one time felt particularly well, and confident in his strength, shortly afterwards he became very dejected, and imagined he was about to die. He slept well that night; and this delusion left him during the following day.

Present Condition — March 12th, 6th day of fever. Integumentary System. The patient has dark hair, hazel-coloured eyes, and appears to be of robust constitution. The cheeks are uniformly flushed, and the conjunctivae are injected. He has an anxious and heavy expression. The trunk is covered with numerous spots of a dirty pink colour, slightly elevated, and disappearing on pressure. Some spots are visible on the upper extremities, and a

few on the thighs. The skin generally is dusky, and dry: the palms being moist.
Temperature at 10 p.m. 105°.

Circulatory System. – Pulse 112, soft, rather weak, regular. No cardiac murmurs audible, and the apex beat normal.

Digestive System:– Tongue coneally protruded, and tremulous, dorsally covered with a whitish fur, but the extreme edges and tip are reddish: the organ is moist. The appetite has been poor since the 2nd day of the fever, and he has been very thirsty. He does not remember that the bowels have been opened since the 1st day of the fever. There is scarcely any abdominal tenderness on pressure.

Respiratory System.– Breathing a little hurried, otherwise normal.

Genito Urinary System.– Urine of a dark amber colour, with a copious yellowish deposit. Sp. gr. 1·035, acid: chlorides a little scarcely diminished, no albumen: deposit consists

An isolated note ~~[illegible]~~ in rough note book omitted — "Fair weather — March 15th P. 132. Rather weak. Tongue coated with slightly yellow fur. A great proportion of spots of eruption petechial. Temp 106° (as Thor. 1½° too high — possibly 1½° ought to be subtracted from 106°) Wandering and talkative. Skin dry."

Case I.

of amorphous urates.

<u>Nervous System</u>.- Intelligence is fair, but he is readily confused. Is rather anxious about himself, feels weak, and sleeps badly.

<u>Ordered</u> 11th March.

S. ℥i 4ta hora. { Mist Camph. ℥v
Liq. Ammon. Acet. ℥iii M.

Sweet milk, and beef-tea diet. No wine.

7th day.

March 13th Pulse 112, feeble. Whitish fur on tongue. Had scanty stool last night. Urine turbid with copious deposit of urates, few crystals of triple phosphates. Slight albumen (?) Chlorides diminished, acid reaction, Sp. gr. 1031. Has a little cough. 30 respirations per minute. Skin dry, the palms being moist: Several spots of the eruption are petechial: temp. (mane) 104½. The patient looks more stupid and abstracted today.

9th day.*

× March 15th <u>vesp</u>.- Patient was wandering night of 13th, better during the following day: wandering night of 14th, and has been in a state of low

Case 1

muttering delirium ever since. Pulse 130, feeble. Will scarcely put the tongue out. Skin dry. Temp. 104°. Eruption not so conspicuous, except the spots which are petechial.

Ordered at visit.

To be added to water or common drink. { Acidi Phosphorici ℥j / Aquae ad ℥xvj ℔ss / Vini ℥xvj per diem.

10th day.

March 16th. Muttering last night and to day. Pulse 124, weak. Urine, neutral, Sp. g. 1·018, copious deposit of amorphous urate, and triple phosphate. Chlorides much diminished. Albumen detected. Skin dry Temp (mane) 103½°.

Vesp. Pulse 124. Temp 103½°. During the afternoon the patient endeavored to get out through the window: and wishes to get out of bed very often. The urine of this date found to contain a large excess of urea. The scalp has been shaved and evaporating lotions applied - Vini ℥xx.

11th day.

March 17th (noon). - Pulse 120. Tongue moist, very little protruded: lips covered with black sordes. Bowels

not moved. Skin dry, dusky, and covered with many petechial spots on the trunk - scarcely any on the extremities: temp. 102½°. Is muttering all day, complains of no illness, and strongly objects to the cold camphorating lotion to the head.

Vesp. P. 120. Temp. 102½°. Much sordes on lips.

12th day.

March 18th (noon) Pulse 116, soft. Temp. 101½°. There are very frequent startings in the limbs to day. Nurse states that he slept a little last night, and that he is more quiet to day. Bowels moved this morn.

Vesp. Pulse 98. Temp. 101°. The patient is sleepy, and little deaf. but is more attentive when spoken to. Urine, alkaline. Sp. gr. 1022. Trace of albumen - copious deposit of triple phosphates and phosphate of lime in (the latter in form of spherules & dumb-bells.)

13th day.

March 19th - (noon) Pulse 88 soft. Tongue dry, and covered with a black sordes. Urine, alkaline, Sp. gr. 1024. Trace of albumen. copious deposit of triple phosphate, and phosphate of lime; also tube casts observed. Eruption has faded considerably. Temp. 98°. Was restless all last night.

Case 1

Vesp. Pulse 100 92. Temp. 100°. Tongue dry with. covered with brown sordes. Patient directed attention to a tenderness and redness over the sacrum, also tenderness at occipital protuberance. Vini ℥ x xiij.

14th day.

March 20th (afternoon). Pulse 84. Tongue moist, still covered with yellowish brown sordes: black sordes on lips. Appetite is improving to day. Had motion of bowels this morning. Skin dry: temp. 99°. Slept well last night, but occasionally muttering - Vini ℥ x vj.

day of convalescence

15th day.

March 21st - Pulse 76. Tongue moist, cov'd with brown sordes. Appetite good. Skin dry, temp. (axam) 96½°. Urine cloudy with copious little yellowish deposit. Alkaline, Sp. gr. 1024. No albumen. Chlorides but little diminished: deposit consisting of triple Phosphates and phosphate of lime. Did not sleep well last night. Is very sleepy this morning.

Vesp. Pulse 76. Temp. 97½°. Little more attentive. Still flushed and sleepy. Suspected to be in part from narcotic medicine. Much less urea in urine of this date than that of 16th inst. - Vini ℥ 3 x v.

Case I

16th day.

March 22nd Pulse 80. Tongue almost clean. Urine alkaline. Sp. gr. 1.026. No albumen. Chlorides slightly diminished. Deposit of phosphates. Still sleepy. Vini ℥x.

17th day.

March 23rd Pulse 78, of good strength, regular. Bowels moved this morning. Last night had rigors & clammy perspiration; and complained of neuralgic pains in different parts of the body. Still occasional startings in the limbs. Minute ~~red~~ particles of brick red colour observed in deposit of urine under microscope. Ordered.

1. ℥i 4tis horis. { Ferri Quin: Citr: ℈ß
Mist: Camph: ℥viij M. ft M.

Vini ℥x.

March 24th P. 72. Patient was delirious last night, and wished to get out of bed. Memory is not good. Cannot distinguish between the diff't things he takes. Trace of albumen in urine. Deposit of triple phosphates and of phosphate of lime. Appetite continues good. Vini ℥viij.

March 27th Pulse 60. Tongue clean. Appetite good. Bowels confined. Urine Sp.g. 1.017. Alkaline. Chlorides normal: a little deposit of large prismatic crystals of triple phosphates. The patient is still a little deaf.

but there is manifest improvement in him for the last 2 days. Is getting ~~more~~ more cheerful – and has given an account of his delusions during the fever. He imagined he was two individuals several times: ~~or~~ Once thought he was all dead, with the ~~ex~~ exception of part of his chest. Was always persecuted: and on coming out of the fever, ~~he~~ felt as if he had awoke from a long sleep. ×

<u>Ordered</u> meat diet to-day.

<u>March 28th</u> urine, acid. Sp. gr. 1·016. no deposit.

March 30th. urine has little deposit of crystaline and dumb-belled phosphate of lime. acid. Sp. gr. 1·017.

April 9th Patient dismissed in good health and strength.

× One day, when the delirium was its height, the patient was discovered by the nurse at the window, – endeavouring to get out. It seems that he was then labouring under the delusion that he had got into some great establishment, which was too expensive for him.

Case II.

A mild form of Typhus occuring in a married female. Convalescent on the 10th day.

Anne C---. Aet. 20. Married, a native of Ireland. Resident at Hall Court, Blackfriars Wynd.

Antecedent History.

The patient states that with the exception of having suffered from Measles, Smallpox, and Hooping Cough, during Childhood, and rheumatic pains at various times, she has enjoyed good health through her life.

On Tuesday March 15th she was seized with shivering, but she could not say that she felt unwell that day. The next day she had no appetite for dinner, felt cold and chilly during the afternoon, and towards evening she suffered from a dull pain in the forehead. She was hot, sweating, and sleepless that night, and had to retire to bed earlier than usual. After this she daily got worse, and spent sleepless nights. The bowels were regular. On Thursday night she vomited some yellow stuff.

It appears that some friends ~~of hers~~ of her friends have been lying ill of fever in the next room

Case II

to hers, and that she frequently went in them to assist them.

The patient was admitted into the Royal Infirmary under the care of Dr Laycock March 18th. being the 4th day of her illness. She was in a prostrated state, and an eruption was observed on the skin.

She has had two children, the youngest being now only 11 months old, and suckling.

Present Condition. March 19th 5th day.

Integ: Syst. The patient is in bed, decubitus dorsi; but manifests considerable energy in settling herself comfortably. Face pale, complexion fair, eyes grayish blue, hair dark. She appears to be thin, and of delicate constitution. The expression is a little abstracted. In the Epigastric and hypochondriac regions, there are scattered here and there isolated petechiae well defined, but not elevated above the skin, of a dusky brown or purplish colour; which do not disappear on pressure. Few of these petechiae also visible on the arms, more on the legs. The skin is dry. Temperature (Axilla) 102½°.

Case II

Circ^{y} Syst. Pulse 96, fair volume, rather soft. Regular. Cardiac sounds normal. also area of Cardiac dulness.

Resp. Syst. Respiration quick and short. 52 per min. Has a little cough.

Digest. Syst. Tongue protruded centrally, moist, normally covered with a whitish fur, edges and tip red. Says she is very thirsty, and has no appetite. Vomited this morning. Bowels not moved since admission. No abdominal tenderness on pressure.

Genito urinary Syst. She has been nursing her youngest child during that period for the last 11 months, and has not menstruated during that period. Urine of high colour, pungent odour. with a mucous cloud. acid reaction. Sp. gr. 1·0135. Chlorides diminished, no albumen detected.

Nerv. Syst. Slept fairly last night. Complains of frontal headache, but there is no lumbar pain. Slight pain in Sterno Cleido mastoid muscles. Feels very weak. Appears to be of a nervous temperament.

Case II

Ordered on the 19th inst.

S. ℥i pro dosi. { Ammon. Carb. ℈v
Mist. Camph. f℥vi ft. mist.

S. ℥ß every three hours with the other. { Acidi. citrici ℈iv
— Hydrocyanici dil ♏xij. M. ft mist.

Beef-tea & milk diet. No wine.

Vesp. Pulse 92. Temp. 102½° Headache not so distressing.

6th day.

March 20th Pulse 80. Tongue moist; very thirsty; bowels not moved yet. Skin dry; temp (noon) 101°. Urine slightly acid. Sp. g. 1·033. Chlorides diminished. Nervous elixir; ~~Had mental delusions last night, but~~ slept fairly. (last night, but fancied ~~thought~~ she saw a black man in the ward.)

7th day.

March 21 – P. 84. Bowels moved several times after a draught. Skin moist: temp (mane) 101°. Cheeks a little flushed. Urine, acid, Sp. g. 1·031, deposit of amorphous urates.

Vesp. P. 80. Temp. 101½°. Copious perspirations of foetid odour.

8th day.

March 22d P. 80. incomp. Still has headache, face ~~flushed~~ not flushed. Skin dry: temp. 101°. Urine has copious deposit of urates 1·029. no albumen. Chlorides little diminished.

Case II

9th day.

March 23d. Pulse 76. Tongue protruded coniscally, moist, with whitish dorsal fur. Has but little relish for food yet: but thinks she is quite well, and wishes to leave bed. Few petechiae still visible. Skin exhales very fetid sweats. Temp. 100½. Urine, Sp. gr. 1025. mucous cloud, in which reddish particles observed under the microscope.

10th day.

March 24th. Pulse 84, of better strength. Tongue moist, and almost clean. Bowels moved. Eruption has disappeared. Temp. (evening) 98½°. Looks cheerful to day.

12th day.

March 26th. Pulse 80. Tongue clean, but pale. Bowels rather constipated. Appetite good. Urine, acid, no albumen. Chlorides normal. Phosphates detected chemically. Sp. gr. 1024. Slight deposit of octohedra of Oxalate of Lime. Patient has been out of bed for last two days.

14th day.

March 28th. The patient to day dismissed progressing favourably.

Case III.

Typhus occurring in a patient under treatment for Hemiplegia, which was due to Syphilitic degeneration in the Encephalon? Convalescent on the 8th day.

Thos Johnstone - aetat. 28, Ship-carpenter, married, with three children, resident at South Shields. Admitted into Royal Infirmary under care of Dr Laycock Jan 6th 1864.

About 4 years previous to admission the patient contracted Syphilis, for which he was treated with Donovan's Solution, Sarsaparilla, Iodide of Potassium &c - In the autumn of 1861, he had an attack of Hemiplegia of the right side, with Paralysis of Voice & Speech and of the muscles of Mastication and Deglutition &c - The following is an abridged extract of his case on admission -

Integumentary System - The patient has light hair and complexion: blue eyes, rather prominent, no arcus senilis. Tall, and in good condition. Face rather pale, expression cheerful. Body has a peculiar odour. Temperature of right side less than that of left.

Circulatory Syst. - Cardiac organ normal. Pulse 60, regular, fair volume & strength.

Case iii

Respiratory Syst. - normal.

Digestive Syst. - Tongue protruded concally, and rather to the healthy side. Appetite good. Bowels regular. No difficulty of Mastication and Deglutition.

Genito-urinary Syst. - Micturition normal; urine pale amber, with a little whitish deposit, Sp. Gr. 1·016, no albumen, Chlorides normal: deposit consists of triple phosphates and urates.

Nervous Syst. - Intelligence unimpaired, memory good. Sees dimly with right eye; and the eyelid droops. Voice and Speech is imperfect. Hear the patient is almost unintelligible. Temperature and general sensibility comparatively greater on the left side. Power of motion of the right side of the body much impaired, and the motor power of the left leg imperfect. He cannot raise his right arm to the level with the of the shoulder. Progresses with left side foremost, the right leg hardly trailing.

After admission the treatment adopted at first was Hot-air baths, Strychnia, Faradization &c. - and the patient improved.

Case III

"February 9th Ordered to have gr. v of Iodide of Potassium every six hours."

A history of Syphilis had been obtained.

"Feb 13th For the last week the patient has been daily Faradized: and is taking gr viij of the Iodide three times a day

He is much improved lately. Can now sit in a chair with the right hand, and use knife & fork at table. Urine, pale, Sp. gr. 1·015. no deposit."

1st day of the fever.

Feb 22nd The dose of the Iodide has been gradually increased — for the last few days has been taking gr xxv of three times daily. Patient's health has not been nearly so well for the last week. The power of motion is considerably diminished. The patient states that he feels giddy and weak, cold and shivering: and that he has sensation "of cold water running over the back" today. The face is pale, and the expression more dejected than usual. Pulse 136. Tongue furred, and the breath has a very foetid odour: Appetite bad: has had diarrhoea for the last few days. Urine of

smoky yellowish colour, with little sediment; acid reaction, Sp. gr. 1·023; no albumen: sediment found to consist of amorphous urates. no phosphates detected. Galvanism, and the Iodide discontinued.

5th day.

7 to 26th Pulse of moderate volume, soft, regular, 132. Tongue moist, covered with pale coloured fæces. Dark fæces on lips also. He is now unable to spit, and the Saliva trickles out of the mouth. He is thirsty, has no appetite, and no motion of the bowels since last report. General abdominal tenderness under pressure. Respiration 40 per minute; there is little cough & expectoration. Patient states he has experienced considerable difficulty to pass urine lately. Urine, pale amber, slightly acid Sp. gr. 1·020. no albumen, Chlorides normal: there is slight deposit consisting of triple phosphate and amorphous urates. Skin dry, palms moist; Temperature at 10. pm. (determined by placing Thermometer in the left axilla) = 102½°. There is an eruption on the trunk and limbs, consisting of pinkish spots, slightly elevated, some disappearing under pressure, others indelible. There was

a well marked eruption observed on 25th inst. The face is flushed, and the expression febrile. Intelligence unimpaired. The conjunctiva of the right eye has been inflamed for some days, and it is now oedematous.

The patient now states that he had no "shivering fit" before 22nd inst., and had no headache; but the health was deranged for about 8 days previously; the face was flushed, he felt cold, and the appetite had failed.

According to this account, today is the 5th day.

Ordered —

Liq. Ammon. Acetat. f ℥vi

Aquae Camph. ad f ℥xii

Misce, ut fiat mistura. Capiat Cochlear. ij 4tis horis.

℥xx of Wine daily. Beeftea diet and milk.

6th day

Feby 27th — Pulse 124. Tongue dry, and covered with dark sordes, the crust being fissured. Bowels operated after enema of Ol. Ricini. Urine, Sp. gr. 1.025. acid, no sediment, no phosphates or albumen detected, Chlorides diminished. Skin dry; temp. at 10.30 p.m. — 102½°. He is generally dozing, but intelligent when spoken to.

Case iii

The right eye is almost blind, and the cornea opaque.
Ordered an Opiate Collyrium.

7th day.

Feb 28th Pulse 112. Tongue dry. Collection of sordes on tongue and lips. Bowels not moved since yesterday. Urine. Sp. gr. 1·026, Chlorides much diminished, no albumen; copious deposit, consisting of triple phosphates and spherules & dumb-bells of phosphate of lime. Skin covered with perspiration; temp. 9·30 p.m. 101¼°.

8th day.

Feb 29th Pulse 104, weak. Tongue moist, and covered with less sordes. Is less thirsty, and has relish for his beef-tea & wine. Bowels not moved yet. Urine, Sp. gr. 1·026, alkaline. Chlorides still diminished, whitish deposit of same character as that of yesterday. Skin moist; temp. 8·30 p.m. 98°. Ordered Ung. Hyd. Nit. Ox. To be smeared over the cornea.

9th day.

March 1st Pulse 100, rather small. Tongue moist, still covered with sordes. Bowels not yet moved. Urine. Sp. gr. 1·020, alkaline, Chlorides less dim-

~~Sediment~~ incised. Sediment of still of same character. Skin moist; temp. 97½° (Vesp.). The affected cornea is insensible.

<u>10th day.</u>

March 2nd – Pulse 92. Tongue moist, and cleaner. Urine, sp. gr. 1·015. alkaline. chlorides almost normal, with sediment of phosphates. Skin moist; temp. (Vesp.) 97½°: the eruption is much less conspicuous than it was. The patient can now grasp an object firmly with either hand.

<u>11th day.</u>

March 3rd – Pulse 92, rather weak & small. Slowly protrudes a little of the tongue, ~~now~~ it is moist and covered with little sordes. Bowels not moved yet. Urine sp. gr. 1·016. chlorides a little diminished; copious deposit of phosphates. Skin moist, temp. (Vesp.) 98°. Still says he is 'no better'.

<u>13th day</u>

March 5th – Pulse 80. Tongue moist, covered with slight sordes. Urine, sp. gr. 1·018, copious deposit of triple phosphates, and spherules & dumb-bells of phosphate lime, the latter predominating. Temperature 97½°. Allows he is little better for the last two days.

<u>15th day.</u>

March 7th – Pulse 72, of better strength & volume.

Case III

Tongue moist. Appetite better, and not thirsty. Urine sp. gr. 1·012, alkaline, chlorides normal, copious deposit, consisting chiefly of triple phosphates. The patient looks much brighter and more cheerful.

March 9th – Ordered – Quinae Disulph. gr xij
Tinct. Cardamom Co. ℥j
Inf. Gentian. Co ad ℥viij
Misce ft Mist. S. ℥j 6tis horis.

March 18th – Pulse 80. good vol. & strength. Appetite good, and bowels regular. Urine sp. gr. 1·017. alkaline, copious deposit, consisting of triple phosphates and amorphous urates. The patient is now stronger, and has more power of voluntary motion than he had before the fever. The affected cornea has now almost entirely cleared up, and he sees well with the right eye. Urine gradually reduced to ℥iv per diem.

March 26th. Patient dismissed on this date, in possession of better health and strength than on admission. Urine sp. gr. 1·017, neutral, with slight cloud – in which on microscopical examination minute reddish particles observed – no phosphates detected.

Case IV.

A mild form of Typhus occurring in a boy, convalescent on the 13th day. The fever characterized by drowsiness, no delirium.

John F—— aetat. 10, resident at 333 High St. admitted under the care of Dr Laycock March 28th 1864.

Antecedent History.

The patient states that his father died of Typhus Fever a few weeks ago; that his mother and sister have lately been admitted into the Infirmary with fever: and that their family had the fever from the neighbours.

He says he was in good health previous to March 25th. On this date his appetite failed. (in morning). Had pain in ~~front~~ forehead and small of back, and all day felt cold and chilly. Ever since that day he has had a little cough; bowels have not been moved: and has felt very hot and thirsty, and the pain in the forehead has continued.

Present Condition (4th day of illness)

Integ. Tegt. The patient has blue eyes, fair hair and complexion. He is in a tolerable condition. Face is not flushed, but the expression is a little

Case IV

dull. The skin is dry, palms moist. Temperature (at noon) 104°. A few pinkish coloured spots are scattered over the trunk, which are slightly elevated and disappear on pressure. There is but little mottling of the skin.

Circ. Syst. Pulse 116, fair vol. and strength, regular. Cardiac sounds normal: Systolic sound of good strength and distinct.

Resp. Syst. 34 respirations per min. Has a little cough but no expectoration. Breathing rather hurried. Complains of pain at the angle of the jaw, especially on the left side. The lymphatic glands are felt to be enlarged. This came on the first day day of the fever.

Digest. Syst. Tongue intensely red at tip and edges, and also for short distance backwards along centre: the remainder covered with whitish fur, but red papillae seen scattered over the furred part, so as to resemble a Scarlatina tongue. The organ is moist and concavely protruded. Has but little desire for food, very thirsty. Bowels not moved since first day of illness. There is little abdom-

inal tenderness on pressure, which is particularly complained of in the right iliac region - not so much over the left iliac region.

Genitourin. Syst. See report of 29th inst.

New. Syst. answers questions in a clear manner - He is quiet and little drowsy. Complains of frontal headache, and little lumbar pain.

Ordered.

S. Cochj 4th horis { Liq. Ammon. Acetat. ℥iiss / Aetheris Chlorici ʒiiss / Mist. Camphor. ad ℥viij M. }

Beeftea & milk diet. No wine.

5th day.

March 29th - P. 116. Bowels not moved yet. Urine, amber, with copious deposit of spherules & dumb-bells of phosphate of lime. Chlorides normal, no albumen. foetid odour. Sp. gr. 1.030. ~~acid re~~. alkaline react.n Skin dry, palms moist. A copious eruption to day over trunk. Temp. (noon) $104\frac{1}{2}$. Slept well last night, sleepy this morning.

Vesp. P. 112. Temp. $103\frac{1}{2}$ - 104°. Skin bathed with perspiration.

Case IV

6th day.

March 30th P. 120. (mane) Temp. 103°-103½. Yellowish fur on tongue. Bowels moved this morning. Skin dry. Always sleeping.

Vesp. P. 116. Temp. 104°. Skin moist. Still has headache.

7th day.

March 31st P. 116 in comp. Tongue still of same character as on admission. Urine, acid, mucous cloud Sp. gr. 1·020. Temp 103°. Skin dry.

Vesp. P. 120 Temp. 103°.

8th day.

April 1st Pulse 98. Temp 102° Tongue moist. Bowels not moved for last two days. Still sleepy.

9th day.

April 2nd Pulse 116. Temp 103° Tongue dry. Bowels not moved yet. Urine, acid, slight mucous cloud. Sp. G. 1·015. No albumen, Chlorides diminished. Still sleepy. — Vesp. Pulse 108.

10th day.

April 3rd P. 88. Temp. 102° Urine, acid. no deposit. Sp. gr. ~~1·014~~ 1·017. Chlorides slightly diminished.

Vesp. P. 88. Temp. 102°

11th day.

April 4th Pulse 92. Temp. 101°

Case IV–V

12th day.

April 5th. P. 90. Tongue cov'd with white fur dorsally, elsewhere reddish, rather dry. Bowels ~~not~~ moved last night. Skin moist; temp. 100½. No trace of the eruption visible. Has been quite intelligent throughout, ~~and he~~ Sleeps day and night.

13th day.

April 6th. Pulse 72. incomp. Temp. 98°. The tongue is almost clean. Bowels moved yesterday. Says he feels better, but thinks he ~~f~~ began to improve yesterday. The appetite has been fair throughout, now improving –

The patient was able to leave bed in a week after last report.

Case V.

Typhus, with marked delirium, and great prostration, in a middle aged man, formerly treated for Leucocythaemia. Convalescent on the 15th day.

John L— Aet 35. occupied of late as a confectioner's porter, resident at Fishmarket Close.

Admitted into the R. Infirmary March 31st 1864. under Dr Laycock

Antecedent History.

He Enlisted to the army in 1850, from which he was discharged two years ago. He was at the Crimea through-

Case V

and the Campaign: also in India during the Mutiny.
He had Simple Fever in India, and suffered from an affection of the Spleen for two years subsequently.
He has been porter to a confectioner for the last eleven months, and has enjoyed pretty good health during that period.
On the 26th March his present illness commenced: he felt "done up" after a journey before breakfast, & had no appetite; that night he had a shivering, with frontal headache. He stood to work till the 29 inst.
He has felt himself very hot during this period, and has been very noisy in his sleep.
About a month before the present attack he was to see some friends in the Infirmary.
His wife states, he wore a pair of boots for ten days previous to his illness which ~~cut~~ had been mended in a house where several of the inmates ~~had fever~~ were suffering from fever, and that these boots cut both his heels. No other possible sources of contagion could be traced.

Present Condition, (6th day).

Integ. Syst. Face pale, ~~but~~ and the integument here, as well as elsewhere, pearly, and having an unctuous

smell. Eyes dark. heavy, and conjunctivae injected. Coloured blade hair. Expression anxious, but occasionally comical; the face being sometimes contorted with agony, at others times the patient laughs. The body is rather slight. An eruption is visible on the skin, consisting of brownish-pink coloured spots, scattered over the trunk and arms. They are slightly elevated, and fading ~~too~~ into the surrounding skin; they disappear under pressure, but some only fade. Temperature (at noon) 104°.
~~He lies~~ Decubitus dorsi.

Circ. Syst. Pulse 96. of fair volume, regular, incompressible. Cardiac sounds rather weak, apex beat between 5th & 6th ribs.

Resp. Syst. The breathing is not hurried. ~~Has a dry & frequent cough~~ Has a frequent dry cough. Respiratory murmurs rather harsh.

Digest. Syst. Tongue moist, large & flabby; the anterior third is red, and irregularly fissured; the remainder is covered with a thick creamy fur. The patient is very thirsty and does not care for food. Palpation of the abdomen does not occasion much inconvenience. The vertical dulness over the splenic

Case V

organ measures about 4 inches (~~opposite~~ in a line with the axilla).
The blood appears to be deficient in corpuscles, and the white corpuscles are ~~slightly~~ comparatively increased. The corpuscles do not appear to form in rouleaux as readily as they usually do, and the general appearance is peculiar.

Genit. urin. syst. See tomorrow's report.

Nerv. Syst. Complains of headache, pain in the lumbar region, also in his limbs, which pain he says is very severe. His manner is too strange, sometimes he is inclined to be jocular, then groans. Probably this is due partly to personal peculiarity, partly to febrile excitement. He is a little confused, and does not give a clear account of himself. Appears to be much exhausted.

Vesp. Pulse 96. Temperature $103\frac{1}{2}$.

Ordered at visit —

1. ℥i 4th horis. { Liq. Ammon. Acetat. f℥iv
Aquae Camph. ora. ad f℥viij. ft. Mist.

Beef tea & milk diet. Vini ℥viij.

7th day.

April 1st Pulse 100. almost comp. Tongue moist, very thickly coated dorsally. Bowels not moved yet.

Case V

Urine, amber colour, with slight ~~cloud~~ mucous cloud. pungent odour. Sp. gr. 1.019. Trace of albumen. Chlorides diminished. Phosphates detected Chemically. Skin limbs are still very damp. Temp. (noon) 103½°. He was very restless last night, and did not sleep.

3rd day.

April 2nd P. 108. Tongue red and fissured anteriorly, coated with brownish fur posteriorly, dry in centre. Bowels not moved. Urine turbid with slight deposit of urates. Countenance still pale. Temp. 104 - 104½°. He was wandering [illegible] last night. Then slept.
Vesp. P. 110. Temp. 104½.

4th day.

April 3rd (Vesp) Pulse ~~116~~ 120. Tongue dry. Bowels not moved yet. Urine, alkaline, Sp. gr. 1.025. Chlorides much diminished: trace of albumen: copious deposit of triple phosphate and phosphate of lime. Patient has been in a state of muttering delirium all last night and today. Does not know his friends today. Temp. Vesp 103°

10th day.

April 4th. Pulse 112. Temp. 104½. Tongue brownish. Senna draught administered, which has operated. Urine acid, Sp. gr. 1.025. phosphates detected Chemically: deposit of urates. Still delirious.

Case V

11te day.

April 5te P. 116, weak & small. Temp. 104° (room) Skin oily. Petechiae visible on the trunk. Tongue cannot be protruded. The Motions and urine passed in bed involuntarily. Urine alkaline. Hp. 1026. Chlorides more copious, trace of albumen: deposit of triple phosphates and phosph. of lime. Slept last night. Sleepy to day, but muttering.

Resp. P. 114. Temp. 103½ - 104. Breathing stertorous, 54 respirations per min.

12te day.

April 6te Pulse 108 in comp. Temp. 102°½. Patient is not muttering to day: sticking in bed. Motions passed involuntarily again last night. Pupils contracted (?)

13te day.

April 7te P. 112 Temp. 103° (room)

Resp. P. 104. Temp. 102°. Patient little more attentive tonight for the first time; recognized his friends. Still breathing very stertorously. Expression wild: limbs tremulous.

14te day.

April 8te P. 104. Temp. 102° Urine, alkaline, ~~Hp~~ faetid odour. Chlorides scarcely diminished, trace of albumen: copious deposit of triple phosp. and phosp. lime. Can now protrude tongue. Still sleepy. Slept well last night.

Resp. P. 92. Temp. ~~100°½~~. 101°

Case V

15th day.

April 9th Pulse 88. Temp. 100½

Vesp. Pulse 80. Temp. 98½°

16th day.

April 10th Pulse 76. Temp 98°. Appetite improved. Urine, alkaline, deposit of triple phosphates and phosphate of lime. The patient looks brighter today, talks more sensibly, but still tendency to wander in conversation and he is irritable in temper. Slept well last night.

April 15th Since the last report the patient has been much improved. But he is very weak, and anaemic looking. The eyes are very prominent. The articulation is much impaired, so that it is difficult to understand what he says. He is partly deaf also.

Report discontinued on this date.

Typhus. **Case VI.** — Janet Ferguson — aet 45, single, admitted into R. Infirmary April 18th 1864. under Dr Laycock. A week previously the patient had been dismissed from the Infirmary, after having been under treatment for 6 weeks, for an obscure affection of the skin, accompanied by severe headache, partial blindness, and amenorrhoea. On the morning of the 15th April, she suffered from a frontal headache, and was seized with rigors at noon. The following table shows the daily phenomena presented by the different physiological systems during the attack of typhus, from the 4th day of the fever till convalescence. The last division of the table shows the treatment adopted during the fever.

D.P. signifies day pulse; N.P., night pulse; D.T., day temperature; N.T., night temperature of skin; S.G. = Specific gravity of urine; ▱ = triple phosphates; ⁙ = urates, 8 = phosph. lime; T = tongue; B = bowels; Ap = appetite.

Day of fever	Circulatory System: D.P.	N.P.	D.T.	N.T.	Integumentary System	Genitourinary System—Urine: S.G.	Chlorides	Albumen	Deposit	Nervous System	Digestive System	Respiratory System	Treatment: Stimulants	Diet	Medicines
4	116, regular, of fair strength and volume.	124			Countenance flushed; eyes injected. Skin hot, dusky.					Expression feverish. Frontal headache.	Tongue furred. No appetite. Vomiting the food taken. Thirsty. Bowels constipated.			Beef tea and milk	Liq. Am. Acet. ℥iv, Aeth. Chlor ʒiss, Mist. Camph. ... ad ℥viij, f℥i 4tis horis.
5	118	116-120	102½		Suspicious red spots visible over front of trunk.						Vomiting.			"	"
6	132	132	103	104½	A copious eruption of elevated pinkish spots.		no?	trace	mucoid cloud with vaginal epithelium.		Vomiting. B. not moved yet.			"	"
7	138, irregular.	137	102½	104.	Some spots of eruption petechial.	1032	scarcely	considerable	8 ▱ tubecasts		Vomiting.			"	"
8	139. irregular, weak.	140	102½	102½	Countenance intensely flushed.	1025	yes	considerable	granular corpuscles, and tube-casts.	General hyperaesthesia.	T. moist. Vomiting.		Port Wine f℥iij	"	"
9	146-150, irregular.	148-150	101½	102	Copious petechiae, even on the extremities.					Patient is drowsy. No delirium.	T. moist. Vomiting. B. moved by enema; being first stool since admn.		P. Wine f℥iij Brandy f℥iv	"	"
10	148-154, irregular	148-150	101½	101½	Face paler. Extremities cold.	1020	yes	considerable	granular corpuscles, and tubecasts.	Sleepless at night. No delirium.	T. scarcely protruded, dry, and covered with brown sordes		P. Wine f℥iij Brandy f℥iv	"	"
11	154 systoles per min. Pulse almost imperceptible. Cardiac sounds of fair strength.	148-150	101¾	101	Eruption and mottling still well marked.	1016	yes	considerable	granular corpuscles and tube-casts	Drowsy and stupid. There is still a general hyperaesthesia.	T. dry and brown. No vomiting.		P. Wine f℥vj Brandy f℥vj	"	"
12	138	140 regular.	100¾	101	Countenance not flushed, but dusky.	1020	much	considerable	granular corpuscles, and tube-casts	Tendency to sink to bottom of bed. Speech almost unintelligible.			P. Wine f℥vj Brandy f℥vj	"	"
13	128-132, irregular, stronger	128	101¾		Copious petechiae still visible.	1020	much	trace	Slight deposit of ▱ and tubecasts.	Wandering last night. Today she is wandering, and restless. Pupils contracted.	T. dry, and covered with dark sordes. Still thirsty. 1 stool today.	Slight cough.	P. Wine f℥vj Brandy f℥vj	"	"
14	126-128	128	101½	101½	Skin of a dirty hue. Eruption fading.	1020	much	trace	⁙ and tube-casts	Wandering last night. No wandering today.	T. dry. B. not moved today.		P. Wine f℥vj	"	"
15	120, irregular, weak.	112 irregular.	100	99¼		1021	much	trace	mucoid cloud and tubecasts?	Not wandering last night.	T. dry. B. moved by enema.		P. Wine f℥vj	"	"
16	115	116	99¼	99½	Skin looking brighter.	1023	considerably	mere trace	muc. cloud.	Drowsy and sleepy.			P. Wine f℥vj	"	" Tr Hyoscyam ʒi, Aq. purae ℥ij, Ft haust. h.s.s.
17	110, regular, and of better strength.	104	98¾	98½	Countenance brighter. Skin dry; much clearer	1022	much	mere trace	no tubecasts ⁙	Slept well last night. Sleepy today.	T. dryish. Ap. improving. B. constipated.	Slight cough. No expectn. Sonorous sounds heard over chest	P. Wine f℥viij Brandy f℥vj	"	"
18	98	98	97½	99½		1023	slightly	no	⁙	Still drowsy and stupid.	T. moist, and cleaner. Ap. good. B. constipated.		P. Wine f℥viij Brandy f℥ij	"	" no draught
19	86	100	97	96½	The skin has now cleared up.	1022	no?	no	⁙	Very sleepy	T. dryish. Ap. good. B. moved by enema.		P. Wine f℥viij	"	"
20		84 rather feeble				1023	no	no	⁙	Still sleepy	Appetite good.		P. Wine f℥iv	Beef-steak	"
21	80, regular, of better strength.	100				1021	no	no	⁙	Feels better; but she is very weak.	Appetite good. T. moist	Slight cough.	P. Wine f℥ij	"	"

Typhus. **Case VIII:– Agnes B——**, aet. 26, single, a domestic servant, admitted to Ward XI Royal Infy March 8th 1864. Under Dr Laycock. The patient states that when young she had an attack of Typhus Fever 'cut short'. For the last 12 years has been subject to fits and Dysmenorrhoea. State on admission:– Complexion sallow, cheeks have a slight pink colour; eyes blue and large; hair of a dark fair colour, features and expression rather masculine; under each eye, extensive ecchymosis, so as to resemble 'black eyes'; respiratory system normal; pulse 76; tongue loaded, fissured; bowels habitually constipated; flatulence; subject to headache, restlessness, and fits of despondency; Catamenia regular, discharge scanty; urine, sp. gr. 1010, normal. On the evening of 19th April, the patient had rigors; but says she suffered from headache &c for some days previous to that day. The following table shows the daily phenomena presented by the different physiological systems during an attack of typhus, from 8th day till convalescence. D.P. = Day pulse, N.P. = Night pulse, D.T. = Day and N.T. = Night temperature. The rest of the symbols are same as in the other table.

Day of fever	Circulatory System				Integumentary System	Genitourinary System – Urine				Nervous System	Digestive System	Respiratory System	Treatment		
	D.P.	N.P.	D.T.	N.T.	(No eruption visible on 7th day)	S.G.	Deposit	Chlor. dim.	Albumen				Stimulants	Diet	Medicines
8	80, regular, of fair volume and strength.	88	103	102	Skin a little dusky. Cheeks rather flushed. Eyes suffused. Considerable number of pinkish elevated spots on trunk; some disappearing on pressure.					Intelligence unimpaired. Frontal headache, and pain in limbs. Prostration not great.	T. moist; red anteriorly and laterally, furred dorsally. No appetite. Bowels moved several times by enemata since the day of rigors.			Beef-tea milk &c.	
9	96, regular, incompressible.	92	103	102½	Eruption scanty. Some spots very elevated.	1·028	mucous cloud.	little	no?	Partly deaf.	T. moist, covered with patches of yellow sordes; same on lips. B. relaxed.	Breath very foetid.		"	
10	102, weaker.	99	103	103½	Slight mottling. Few spots petechial.	1·027	granular corpuscles	little	trace.	Drowsy. Slight subsultus. Slept a little last night.	T. rather dry. Vomiting. Two or three scanty motions daily, of yellow colour.		S. Wine f℥iij	"	Liq. Ammon. Acet. f℥ss ter die
11	104, irregular.	112	102¼	102½	Many spots petechial, and not elevated.	1·026	muc. cloud	considerably.	trace	Drowsy.	T. dry. B. relaxed. No more vomiting.		"	"	"
12	100-102, irregular	114	101¾	102		1·026	tube-casts	much	considerable	A little wandering towards evening.	T. dry and foul.	Slight cough. Sonorous râles audible over right chest.	"	"	Effervescing mixture of Potass. and Acid. Citric.
13	Pulse very irregular, uncountable. Systolic sound scarcely audible.	116	102½	102½			muc. cloud no tube-casts	much	trace	Left her bed several times last night; but not violent or noisy. Sleepy today.	T. dry, and a little fissured. Sordes on lips and tongue. B. still relaxed.	Sibilus heard over left chest.	"	"	"
14	106, less irregular	108	102½	102		1·016	muc. cloud	much	trace	Frequently leaves her bed. She is pretty rational at times.	T. dry and red: no coating. Three motions of bowels in 24 hours: Stools yellow.		"	"	"
15	111, irregular. Cardiac sounds of better strength.	112	101½	102½	Skin paler, and eruption fading.	1·016	muc. cloud	much	trace	Slept a little last night.	T. same as yesterday. B. relaxed.	Dry and moist sounds heard over chest. A little expectoration. Streaks of blood & rusty spots in sputa.	"	"	"
16	92, regular, weak, compressible.	102	101½	102½		1·022	[illegible]	much	trace	Drowsy, and quite indifferent. Pupils contracted.	T. not protruded: it is dry. B. relaxed.	The pulmonary obscure the cardiac sounds.	P. Wine f℥vj	"	"
17	90, regular		101		Skin a little clearer. Patient looks better.	1·024	[illegible]	very much	no	Not so deaf.	T. readily protruded, and less dry. B. not moved since yesterday.	Breathing a little hurried. No expectoration. Dry sounds heard over chest.	"	"	Medicine discontinued.
18	92	87	100½	101½		1·021	no deposit	much	no	Patient more intelligent.	T. dryish, and cleaner.		P. Wine f℥vj	"	
19	84, regular, soft, of fair strength. Cardiac sounds stronger	91	99	101½	Eruption still visible.	1·026	[illegible]	much	no	Slept pretty well last night. Patient is quite intelligent now, but sleepy.	T. dryish. B. constipated. Has been taking a good quantity of ~~beef-tea~~ for last 2 nights.		"	"	
20	86, regular	89	100	100½			[illegible]			About the same.	T. dryish, slightly coated. B. constipated.	Pulmonary symptoms much better. Still a cough.	"	Beef-steak.	
21	80, of fair strength.	83	99	100½	Skin dry. Trace of eruption apparent.		[illegible]	much	no	Feels much better, Drowsy.	T. dryish, still coated, slightly coated. Appetite good. Bowels relaxed.	Frequent cough, no expectn. 48 respns per min. very irregular. Slight rhonchus audible.	"	"	
22	78	80	98½	98½	Patient looks much better.	1·025	[illegible]	copious chlorides	no	Sleepy. Patient is getting more irritable. Scarcely any deafness.	T. foul. Takes her food well. B. very relaxed for last 24 hours. Stools dark yellow.		"	"	
23	84		100								T. dryish, foul. Appetite good. No diarrhoea today.	no cough.	"	"	
24	80		99¼		No trace of eruption now visible.						T. moist, but foul and flabby.		"	"	
25															