OBSERVATIONS
ON THE
TEMPERATURE AND THE URINE
IN TYPHUS FEVER.

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Received April 4th.—Read June 25th, 1867.

THE following observations were made whilst I was Resident Medical Officer to the London Fever Hospital. To Dr. Murchison my best thanks are due for allowing me to carry them out on patients admitted under his charge, and for many valuable hints in connection with them.

Observations were made on eighteen cases.

The temperature in each case was taken four times daily, as punctually as possible at the stated hours whilst it was above the normal point, and afterwards twice daily till the patient left the Hospital.

The urine was collected every morning at 8 a.m., and examined the same day for urea and chlorides.

The analyses were made according to Liebig's volumetric method. In analysing the urea the chlorides were not separated, but allowed for in proportion to the quantity present.

The colour of the urine has also been carefully noted, and in doing so the urine was daily compared with the table of colours, given in Neubauer's and Vogel's book 'On the Urine.'

A full account of each case with the temperature chart and daily analysis of the urine will be found at the end of this paper. I will here merely state that, in all the cases, the date of the invasion of the disease was accurately ascertained, that in almost every case it was characteristically sudden, and that in all it was well marked by rigors, headache, and general pains.

That of the eighteen cases the first ten were very bad, being accompanied with much delirium and stupor, and having copious dark petechial rashes, with dry brown tongues and sordes-covered teeth and lips. In all these there were the peculiar vacant "typhus" expression.

Of these cases one died.

Of the eight others, Case 15 was the worst. In each, with one exception, there was a distinct though not very copious rash. The tongues remained moist throughout, or were only dry for a day or so during the attack. The delirium and stupor were less, the patients could be more easily roused and could be made to answer questions, though certainly not truly with regard to their condition.

In one case, No. 18, there was not at any time a distinct rash, only slight mottling being noted for a day or so after admission. The boy, however, had come from a house where typhus fever was rife, his father and brother had been in the hospital with the disease, and from there being no other symptoms to account for his high temperature, which ran much the same course as typhus fever although of shorter duration, I think it not unfair to conclude that it was a mild attack of this disease. During the time that he was in the hospital he was in a typhus fever ward, and the fact of his not contracting it also points to the same conclusion.

One case, No. 15, was admitted on the second day of the disease, and on the third day, with regard to the rash, it is noted that the skin of trunk is injected with, here and there,

some slightly elevated rose-coloured spots which disappear entirely on pressure. On the fourth day the typhus rash was distinct.

Case 9 was admitted on the third day; in this case the rash did not appear till the fifth day of the disease.

Complications noted.

Diarrhœa was present more or less in seven cases (Nos. 1, 2, 5, 8, 9, 15, and 16). In all but Case 1 it was easily stopped by a mixture containing chalk and catechu. It was not accompanied in either case by any tympanitis or tenderness of the abdomen.

Respiratory organs.—*Bronchitis* was present more or less in every case, excepting Nos. 11, 17, and 18. In Cases 1, 2, and 3 there was much congestion of the bases of the lungs as well. Case 1 died, and in Case 2 consolidation of both bases followed the congestion, and this again was followed by well-marked evidence of gangrene of a circumscribed portion of the lower lobe of the left lung.

Heart.—The impulse could scarcely be felt, and the first sound was noted to be feeble in all cases during the second week of the attack.

In Case 15 a soft blowing systolic murmur of maximum intensity at the left apex, scarcely audible at base, was noted from the twelfth to the nineteenth days, not afterwards.

Reduplication of the second sound was audible more or less in every case.

In Case 6 convalescence was retarded by occasional boils and sore throat, causing sudden and very high elevations of temperature.

Treatment.—This has been in most cases simply Mist. Camphoræ ʒj, every four hours, followed by a mixture containing either bark or quinine as soon as convalescence was established.

Cases 3, 4, 7, and 13, took a mixture containing ether and sulphuric acid instead of Mist. Camphoræ; and Cases 15 and

16 a mixture containing the dilute nitric and hydrochloric acid.

Brandy was given in Cases 1, 2, 3, 7, 11, and 12; porter or wine in almost every case during convalescence.

The diet consisted of milk and beef-tea with arrowroot and eggs during the acute stage, followed by fish or meat as soon as patient felt able to eat.

The temperature.—The range of temperature in the following cases agrees very closely with the general remarks made by Dr. Buchanan, in his paper 'On Typhus Fever,' in Reynolds' system of medicine.

1st. These cases show that the rise of the temperature at the commencement of the disease is very rapid.

2nd. That the range of temperature the first week or so continues very high, and that it varies very slightly.

3rd. That a well-marked remission in the temperature generally occurs between the seventh and tenth days of the disease.

4th. That the lysis is gradual and commences in uncomplicated cases with this remission.

5th. That the lysis may be interrupted by exacerbations which may be produced either by complications or by some external disturbing influence.

6th. That during the first week of convalescence the temperature is rather low, rising again after a variable period, depending on the severity of the attack, and the constitution of the patient, to the normal line or even higher.

7th. Four of these cases show that during convalescence the temperature may rise to above 100° Fahr. (37·7° cent.), and continue so for a day or two without there being any assignable cause.

The following are the facts on which each of these statements is founded:

1st. The rapid rise of temperature at the commencement of the disease is shown by Cases 9 and 15, in which it rose to 105° Fahr. (40·5 cent.) and 104·6° Fahr. (40·3° cent.) respectively on the third day of the attack.

In Case 18 a temperature of 104·6° Fahr. (40·3° cent.) was

noted on the second day, but in this case there was no distinct typhus rash.

2nd. The high and slightly varying range of temperature during the first week or so is shown by thirteen cases, in all of which the temperature remained above 103° Fahr. (39·4° cent.) during this period.

Six of these cases were, though only admitted on the seventh day of the disease, so that in these the foundation for the above rests only on one or two observations taken on the day of admission, when it might be that the excitement and disturbance consequent on the removal of the patient to the hospital had caused the temperature to rise higher than it otherwise would have done. Still, of the seven other cases admitted, two on the third, three on the fifth, and two on the sixth day, the temperature continued above 103° Fahr. (39·4° cent.), till the seventh day, and there was no particular difference noted in either of them between the temperature, the day of admission, and that of the succeeding day.

The slight daily variation that existed at this time, or rather before the commencement of the lysis, is shown by fourteen cases in which it was under 1·5° Fahr; the difference between the night and morning temperature of succeeding days was in eight cases 1° or less, in six cases 2° or less.

The highest temperature noted 105·2° Fahr. (40·6° cent., in two cases.

The maximum point was reached—

In one case (No. 18) on the second day; in four cases on the fifth and sixth days; in three cases on the seventh day; in four cases on the eighth day, in one case on the tenth day; and in one case on the eleventh day.

The five cases in which the maximum temperature was noted on the eighth and tenth days did not, however, come under observation till the seventh day.

3rd. That a well-marked remission in the temperature generally occurs between the ninth and tenth days is shown by all the cases. In Cases 1, 4, 15, and 17, it was very slight. In Case 18 it occurred on the fifth day.

4th. That the lysis is gradual and commences in uncom-

plicated cases with this remission is shown by eight cases (Nos. 2, 3, 4, 7, 12, 13, 15 and 18). In three of these cases it occupied three days, in the five others a still longer time.

Thus it is seen that these observations do not confirm the statements made by Dr. Buchanan and Aitken, both of whom say that "the abrupt manner in which the fever leaves the patient is peculiar to the disease, that the lysis is frequently completed in twenty-four hours, sometimes in less.

The observations of Dr. G. S. Smith, of the Edinburgh Hospital for Sick Children,¹ and those of Dr. Perry, of Glasgow, and Dr. Compton, of Dublin, also coincide with these observations as to the more gradual decrease of the lysis. And Dr. Gairdner, as far back as January, 1865, states of the crisis, "that it is rarely quite rapid or sudden, usually extending over two or three days, and often rarely appreciable till it has been forty-eight hours or more in progress."

Generally the lysis commences with slight daily remissions. The daily fluctuations become also greater, and these increase the nearer the temperature approaches the normal point, as in Case 3. It may, however, be quite gradual throughout, as in Case 7, and in some, as in Case 12, it will be seen that the daily remissions at the commencement of the lysis may be as great as those at its termination.

The duration of the lysis depends on the severity of the attack and on the constitution of the patient, in severe cases being prolonged to the end of the third instead of the end of the second week.

In these cases complete defervescence was established, on or before the fourteenth day in eight, before the eighteenth day in the others.

5. In nine cases a slight exacerbation of the temperature has occurred after the commencement of the lysis, lasting for a day or more. In eight of these no distinct cause could be discovered for its occurrence. In all the patients were more delirious at this time. In Case 9 the rise in the temperature was due to the disturbance and noise made by a wildly delirious case in the same ward.

¹ See 'Edinburgh Medical Journal,' March, 1866.

6. That during the commencement of convalescence the temperature is lower than normal, is shown by four cases, in which a temperature of 96.8° Fahr. (36° cent.) was noted about this time.

7. In four cases during convalescence the temperature is seen to have been much above the normal point. In neither of these cases could any complication be found to account for it, and although in Case 15 the temperature was above 101° Fahr. (38.3° cent.), on the twentieth day, his appetite was very good, and he expressed himself as feeling very well.

Diagnosis and Prognosis.—Of the following cases there are only two, Cases 9 and 15, coming under observation before the characteristic rash appeared, from which any conclusions can be drawn as to the value of the thermometer as a means of diagnosis between the acute specific fevers.

In both these cases the temperature was above 104° Fahr. (40° cent.) on the third day of the disease, but such a temperature will not, as far as I know, exclude typhoid fever on the one hand or smallpox on the other.

In scarlet fever the appearance of the rash on the second day and in measles the special premonitory symptoms will enable us to distinguish them sufficiently early; but in smallpox and especially varioloid, typhus fever, and typhoid fever, very little help, unless the case be well marked, is afforded by the early symptoms.

The rapid rise and the continued elevation of the temperature in these cases foretell the invasion of a serious disease, but I do not think it enables us to foretell, with certainty, which one of these fevers is approaching.

With regard to *prognosis*, the temperature during the second week will generally give great help. A very high temperature during the first week is not of so much importance as continued elevation in the second week. And of more importance still than this continued elevation is an "abnormal temperature," that is, the temperature falling rapidly, whilst all the other symptoms continue with unabated severity, see Cases 1 and 2; and also a case, L. R—, one of three cases published in the 'Lancet' of December 9th, 1865,

Dr. Compton, of Dublin, has also noted "that an abnormal course of temperature much more generally precedes a fatal termination than any unusually high range."

A too favorable prognosis should not be given from the remission that occurs between the seventh and tenth days of the disease, for although it indicates that the disease is running a favorable course, it does not denote that the most dangerous period of the disease is passed.

The temperature and the pulse, although corresponding in their fluctuations more or less in every case, have not done so so regularly that any number of beats can be said to correspond with any particular amount of variation in the temperature.

Out of these eighteen cases the following irregularities, so to say, have been noticed. Thus, in one case (No. 2), the temperature has risen at a much greater rate than the pulse, the former being 103° Fahr. (39·4° cent.), and the latter only 92 on the seventh day ; the pulse was 120 on the twelfth day.

In two cases the temperature being very high, the pulse remained low throughout. Thus, in Case 5, the temperature being 104° Fahr. (40° cent.), the pulse remained below 100, though the range for the last week of the patient's stay in the hospital, when he was feeling well and strong, was between 70 and 80 beats per minute, and in Case 11 it was much the same.

In three Cases (Nos. 8, 12, and 18) the temperature reached the normal rate before the pulse.

In seven cases the pulse was normal before the temperature, and this is most marked in Cases 13, 14, 16, and 17.

The Urine.

There are at present very few published observations on the urine in typhus fever.

Besides the one case by Dr. Parkes', I know of only two others by Mr. Dunnett Spauton in the 'Medical Times and Gazette' of 1864, and of a series of six cases by Dr. Keith

Anderson, published in the 'Edinburgh Medical Journal' of February, 1866.

Dr. Anderson's observations differ entirely from those of Dr. Parkes, the result that Dr. Anderson arrives at being that "the quantity of urea excreted daily during the second week of the disease is decidedly below the standard of health, notwithstanding that the patients were in a high state of fever, with a temperature and pulse much above the normal rate." He does not from this infer that there is a lessened formation of urea, but that it is not eliminated at this period, but retained in the system to be discharged later in the disease, yet neither of his cases, so far as they are published, show that the great retention of urea which must have occurred in every case is at all made up for by increased elimination at any time afterwards. There is also, in his observation, a great discrepancy to be noted in every case between the proportion of urea and the total solids as calculated approximately from the specific gravity. Take, for instance, the twelfth day of Case 1, where the urea amounts to only 18·05 grains in the whole twenty-four hours. The total solids are that day 354·7 grains, or nearly twenty times as much as the urea. The chlorides being very much diminished and the sulphates only slightly increased (Parkes), of what can these other solids, supposing the urea to have been rightly determined, be made up of? I have taken an extreme instance, but still this discrepancy exists more or less in every case.

Dr. Anderson's analyses were made according to Davy's method; and without in the least wishing to undervalue this mode of analysis, I would merely point out that, of all, it is the one to give the most unsatisfactory results unless the greatest care is taken in its performance.

Dr. Buchanan, from the results of his own experiments, states that the daily quantity of urea during the first week, when the patient is fed on low diet, milk and beef-tea, is about double that of the fourth week, when he is sitting up and eating his fill of meat. That the increase has been found at the earliest day at which the urine has been examined.

The analyses in the following cases were made according to

Liebig's volumetric method. In analysing the urea, the chlorides were not separated, but allowed for in the following ratio in every case.

1. When the chlorides for the whole twenty-four hours were less than 1 gramme, nothing was allowed for them.

2. When the chlorides were less than 5 grammes during the whole twenty-four hours, 1 cubic centimètre was deducted from the mercury solution used before calculating the urea.

3. When the chlorides were more than 5 grammes for the whole twenty-four hours, 2 cubic centimètres were deducted, as is generally allowed.

Albumen when present was separated before determining the urea.

The weight of each patient has been noted once or twice in the course of the disease. In calculating the amount of urea and chlorides excreted per kilogramme of body weight, the patient's weight on leaving the hospital has always been taken; and again, in making these calculations, I have not taken any stated time such as first and second weeks of the disease, but have in each case divided the attack into the following periods:

1st. That before the commencement of the lysis.

2nd. That occupied by the lysis itself.

And 3rdly. The remaining time of patients' stay in hospital has been divided into first and second weeks of convalescence, &c., as I think that by these means only can it be seen whether any relation exists between the excretion of urea and the temperature.

The following is a short account of the urea in each case.

CASE 1.—William L—, æt. 29, weight not known. In this case only one day's urine could be obtained before the patient's death, as he was very delirious, and suffering much from diarrhœa. He passed on this seventh day 910 c.c. S.G. 1025 acid, and it contained a little albumen; the urea was 37·310 grammes, the chlorides 1·820 grammes. It was a red-dish yellow colour and had a copious deposit of lithates; as the disease advanced the albumen became very copious.

CASE 2.—Henry W—, æt. 51. In this case, before the commencement of the lysis, no urine could be obtained. During the lysis and the first week of convalescence he was passing more than the normal quantity, it being per kilogramme of body weight '697 and '677 of a gramme respectively.

During the second, third, fourth, fifth, sixth, and seventh weeks of convalescence it was much below the normal amount, especially in the fourth week, when it was only '328 of a gramme per kilogramme of body weight. During the eighth and ninth weeks of convalescence he passed the normal amount. The patient, during his stay in the hospital, was in a very low weak state, suffering much from cough and expectorating a quantity of gangrenous smelling sputa. When he left he was still thin and weak, his cough was better and his sputa scarcely at all foetid.

Of the remaining cases, in 6 (Nos. 3, 4, 7, 12, 15, and 16) the urea excreted was above the normal rate both before and during the lysis, and in Cases 7 and 15 remained so even during the first week of convalescence, falling afterwards to less than the normal rate.

In four cases (Nos. 8, 9, 10, and 18) the urea excreted was much above the normal rate before the lysis, but less than normal during the lysis and for a variable time afterwards.

In five cases (Nos. 5, 6, 11, 14, and 17) the urea excreted was less than normal before the lysis, above the normal rate during the lysis, and in Cases 11 and 14 it remained high during the first week of convalescence.

In Case 13 no urine was obtained before the commencement of the lysis; during the lysis the urea excreted was above the normal rate, less afterwards.

In the four cases Nos. 8, 9, 10, and 18, the excretion of urea per kilogramme of body weight before and during the lysis was as follows :—

			Gramme.	The normal being
In Case 8, æt. 18, before the lysis	...	...	·616	} ·500 of a grain.
during „	...	...	·497	
„ 9, æt. 13, before	...	...	·748	} ·600 „
during „	...	...	·571	
„ 10, æt. 17, before	...	...	·658	} ·500 „
during „	...	...	·400	
„ 18, æt. 11, before	...	...	1·170	} ·800 „
during „	...	...	·671	

So that only in Case 10 is the urea much below the normal amount during this period (the lysis), in the others very slightly so, and considering that for some time the patients had been in bed living on low diet (milk and beef-tea), it must be allowed that although below the normal rate, it was still a large quantity for such patients to pass.

Of the five cases (Nos. 5, 6, 11, 14 and 17), in which the excretion of urea was below the normal amount before the lysis, whilst the patient was in a high state of fever, it will be seen that in one case (No. 5) the patient was at this time suffering from severe diarrhœa, which would perhaps be sufficient to account for it; that in this case, and also in Case 6, the urea was decidedly above the normal rate during the lysis, and that besides in both these cases only one day's urine was obtained at this period, and it will be allowed that the urine of one day is not sufficient to found an average on, in a disease where the daily excretion may be so irregular.

That in two more of the cases (Nos. 11 and 14), in each of which two days' urine were obtained at this time, the urea is seen to be only slightly below the normal amount, it being per kilogramme of body weight ·485 and ·473 of a gramme respectively, whilst during the lysis and first week of convalescence, especially in Case 14, the urea is so largely increased that it points rather to the lessened quantity of urea before the commencement of the lysis to be due to its non-elimination rather than its non-formation.

That in the other case (No. 17) six days' urine were obtained before the commencement of the lysis. During this time the excretion of urea was very regular, and the amount passed was much below the normal quantity, it being per

kilogramme of body weight only '438 of a gramme, the normal being about '600. During the lysis it was decidedly above the normal rate, but as the lysis only occupied three days, and the excretion of urea during this period was not sufficient to make up for the diminished excretion of the previous days, I think in this case it must be allowed that during the high temperature before the commencement of the lysis, there was not only a diminished elimination of urea but a lessened formation as well.

The daily excretion of urea in these cases has not been so regular as in that one of Dr. Parkes'.

In his, during ten febrile days, the range was one gramme below the mean of the ten days, and one and a half grammes above it.

The least variation in the daily excretion of urea that I have noted was in Case 3, the range being for four febrile days 5.177 grammes above and 3.915 grammes below the mean amount.

The largest amount of urea excreted on any one day was 65.570 grammes by Case 15 on the twelfth day of his attack, the temperature the previous day having been above 104° Fahr.

Patient's age was twenty, his weight 52.3 kilogrammes.

From these analyses the following conclusions are drawn :

1st. That during the first period of an attack of typhus fever before the commencement of the lysis, there is an increased formation, and generally an increased elimination of urea.

2nd. That during the lysis, and sometimes during the first week of convalescence, the *urea* is generally excreted at more than the normal rate.

And 3rd. That for a variable period during the commencement of convalescence the urea is much diminished in quantity, rising again to the normal amount as the patient regains his health and strength.

The chlorides.—The analyses were made according to Liebig's volumetric method.

When albumen was present it was separated by the pro-

cess described in Neubauer and Vogel's book on the urine, before the chlorides were determined.

Of the eighteen cases, Case 1 died; before his death only one day's urine was obtained. On this the seventh day, the chlorides were much below the limit of health, being only 1.820 grammes.

In the other seventeen cases the chlorides were excreted at much less than the normal rate during the pyrexial period and for a variable time afterwards; thus—

In five cases (Nos. 5, 6, 11, 12, and 17) the daily average of chlorides was less than one gramme both before and during the lysis, gradually increasing after this time.

In three cases (Nos. 4, 9, and 14) it was less than one gramme before the commencement of the lysis.

In two cases (2 and 16) the daily average of chlorides was less than one gramme during the lysis; and in the seven other cases the daily average was more than one gramme throughout the pyrexial period, though much below the normal rate.

The first increase noted in the excretion of the chlorides has occurred in eight cases before the temperature has reached the normal point; in two cases just at the end of the lysis; and in the remaining seven cases two or three days after the normal point had been reached.

This increase has in all cases corresponded with the return of the appetite, and the large quantity of chlorides daily excreted in some of these cases during convalescence, as in Cases 2, 5, 10, 13, 14 and 17, where it is seen that the excretion is much above the normal quantity, is most likely due chiefly to the large quantities of food taken at this time by the patients.

Four cases left the hospital before the excretion of chlorides had reached the normal rate, but in the remaining thirteen the excretion was much above the normal quantity when they were discharged.

The average daily excretion of chlorides has remained below the normal rate in each of these cases for a variable period.

Thus in one case, No. 4, only till the end of the lysis, the excretion then so rapidly increasing, that during the first week of convalescence, the daily average was above the normal rate.

In eight cases (Nos. 5, 7, 9, 10, 13, 14, 16, and 17) the average daily excretion was below the normal quantity till the end of the first week of convalescence.

In five cases (Nos. 6, 11, 12, 15, and 18) it was below the normal quantity till the end of the second week of convalescence.

In two cases (Nos. 8 and 3) till the end of the third week of convalescence.

And in one case (No. 2) till the end of the fourth week of convalescence; in this case, though, there was a lung complication.

In all these cases more or less salt was taken with the nourishment, whilst the patients were on low diet, though, no doubt, much less than is generally taken in health.

These cases thus prove what Dr. Parkes states, namely, that the chlorides are almost entirely absent during the pyrexial period. Their absence seems to be due *chiefly* to the lessened ingestion of salt in the food at this time. Their absence, though, cannot be entirely explained by lessened ingestion, as Dr. Murchison quotes two cases where salt was given in large quantities during the height of the fever, and yet was not discovered in the urine, although it was examined carefully for them for several days after.

In these cases the chlorides must either have been retained in the system or not absorbed at all.

In my own cases I think the large increase in the elimination during convalescence points to a certain amount of retention having occurred during the pyrexial period.

The amount of urinary water.

As nothing whatever is known in these cases with regard to the ingestion of fluid, which has so much influence on this

secretion, the following statements must be taken in a very general way.

I will only here say that the patients were not at all stinted in their drink at any time of the disease, being allowed plenty of water as well as their fluid nourishment during the twenty-four hours.

The mean of a number of experiments on the amount of this excretion during health collected by Dr. Parkes is 1500 cubic centimètres. This I propose to consider as the normal amount, and to compare with it the amount of urinary water in these cases during each period into which they have been divided. Thus—

1st. *Before the lysis.*—In only one case has the average daily excretion of water during this period been above the normal rate (1500 cubic cent.). In the sixteen others it was below this, and in seven of them below 1000 cubic cent.

2nd. *During the lysis.*—In four cases the amount of water was above the normal rate. In thirteen others below, and in five of these below 1000 cubic cent.

3rd. *During the first week of convalescence.*—The amount of water was below the normal rate in all cases below 1000 cubic cent. in eight.

4th. *During the second week of convalescence.*—Out of fifteen cases, in five the amount of water was above, in ten below the normal rate.

5th. *During the third week of convalescence.*—Out of nine cases it was above the normal quantity in four cases, below in five cases.

6th. *During the fourth week of convalescence.*—Out of five cases it was above normal in four, below in one case.

Therefore from these observations I think we may state in a general way that the amount of water excreted by the kidneys is diminished both before and during the lysis, and for a variable time afterwards, but that, about the end of the third week of convalescence, the quantity passed has reached the normal rate or more.

Colour of the Urine.

This has been determined by the plate of colours given by Vogel. He distinguishes three groups—the yellow, the reddish, and the brown or dark group.

In the one case that died the urine was for a day or so before a brownish-red colour; it contained a quantity of albumen and, judging from the colour, blood.

In the other cases the colour of the urine has for the most part belonged to those of the second group. Reddish-yellow and yellowish-red being the predominating colours during the pyrexial period and for some time after, then gradually losing the reddish tint and toning down into the first group; in some cases becoming almost colourless. There has generally been a copious deposit of lithates during or towards the termination of the pyrexial period.

Albumen was noted in twelve out of the eighteen cases at one time or other of the disease. In neither case was the urine examined microscopically for casts.

In five cases the urine was found alkaline for a day or so during the disease, and generally about the end of the third week.

The Temperature Chart.

Each large square represents one day's observation, the smaller blue squares show the division of each degree into fifths. The vertical column on the left side of the chart gives the temperature in the Fahrenheit scale, that on the right the temperature in corresponding degrees of the Centigrade scale. The three horizontal columns at the top of the chart indicate the day of the disease, the hour at which the observation was made, and the pulse.

CASE 1.—William L—, æt. 29. Admitted into the London Fever Hospital, March 26th, 1866. Is a labourer by

trade ; married. Says that he has been ill four days. His attack commenced with headache, chilliness, and general pains. On admission his mind was quite clear ; his skin was hot, and there was a distinct typhus rash on the forearms and back of his hands, less on his trunk. His tongue was moist and thinly furred, his bowels had not been open for a day or so. He had no cough, but he complained of much headache and general pains.

Rash.—Was well out on his trunk and limbs on the sixth day ; there was very little mottling, and the spots were large, rather dark, and irregular in size. It grew very dark and petechial, but faded somewhat before his death on the seventeenth day.

Sleep.—Bad from the commencement. Wandered, and was very restless from the seventh to the ninth, then became heavy and drowsy, with only occasional low muttering delirium. Patient could answer questions truly till the tenth day, then grew confused, and after the thirteenth he did not notice anything, lying in a heavy stupid condition.

Complexion.—Muddy, slightly flushed at first, but pallid after the tenth day. His pupils were small, the conjunctivæ suffused and injected. Lips dry, with sordes after the eleventh day. Expression dull and vacant after eighth day.

Tongue.—Dry and rough on the ninth, was brown on the thirteenth day, and caked over with dark-brown fur on the sixteenth day.

Bowels.—Confined at first, were loose more or less after the tenth day. Urine was passed in bed after the ninth day, and also fæces after the twelfth day.

Thirst.—Complained of at first. Took drinks very badly on the fifteenth and afterwards.

Perspiration.—Copious on the nights of ninth and tenth.

Cough.—Patient had some troublesome cough on admission, with slight expectoration. On the eighth day some bronchitic râles were audible over the back ; these increased, and with them at bases towards end of disease some large moist râles were audible. There was some dulness on percussion at bases of lungs on the twelfth day.

p. 347. William L. —, Aged 29 — Admitted into the London Fever Hospital, March, 26th 1866.
The 5th day of his Illness.

Diagram I.

Heart.—The pulse was very weak on admission. First sound was inaudible at base after the eleventh day; both were audible at the apex, but much muffled in character.

In this case only the urine of the seventh day was saved, the patient in his delirium passing it in bed. He passed on this day 910 c.c., S.G. 1025; and containing a trace of albumen.

The treatment was, in this case, large quantities of brandy daily, 12 oz. daily. Counter-irritants to the back and chest, and various remedies were tried to stop the diarrhœa. (See Diagram I.)

CASE 2.—Henry W—, æt. 51, admitted into the London Fever Hospital, November 7th, 1865. Has been ill six days. Is married, and a labourer by trade. Says that he is very poor indeed, and has not been living at all well. He says his present illness commenced six days ago with headache, shivering, and general pains.

On admission his skin was hot, and there was a distinct rather petechial typhus rash on the trunk and limbs. His tongue was moist and covered with a white fur; his bowels had been open the day before admission. He complained of little headache and some slight cough. His lungs were clear at bases.

Rash.—Grew very dark and petechial as the disease advanced. It began to fade on the fifteenth day, but slight remains of it were visible till the twenty-fifth day.

Sleep.—Till eleventh day pretty good, with little wandering. From eleventh to the sixteenth day there was much low muttering delirium, and patient was very restless, scarcely sleeping at all. After this he slept somewhat better, only wandering slightly every now and then. Between the twentieth and thirtieth day his cough became very troublesome and prevented his sleeping at night.

Complexion.—Sallow, with suffused and slightly injected eyes, the pupils rather contracted, and sordes on the legs and teeth from the eleventh till the eighteenth day. Then

slightly improved, but remained pallid and sallow till he left the Hospital.

Tongue.—Moist and furred till eleventh day, then became dry and brown, and continued so more or less till the nineteenth day, then gradually improved, but remained dry down the centre for some time, and after this became red and swollen.

Bowels.—Rather loose on the eleventh day; were confined after this, not being open without medicine.

Headache and general pains not complained of after admission.

Appetite.—Began to return about the twenty-eighth day but for a long time after this was very variable, sometimes pretty good, at others entirely gone.

Thirst.—Complained of slightly the first few days, but not afterwards.

Mind.—Patient remained in a very low stupid confused state for a long time after the fever had left him.

Lungs.—During the pyrexial period he had much bronchitis and congestion of the lungs, but not much dulness on percussion at bases. About the twenty-sixth day he complained of pain in the left side on drawing a deep breath, and on coughing. His cough became more troublesome, and he expectorated more; on the twenty-eighth day there was dulness on percussion at the left base, and round left side, with fine crepitation audible on deep inspiration, almost as high as the angle of the scapula. On the thirty-eighth day this dulness was noted as a circumscribed patch at the left base, about three inches in diameter, with some tubular breathing, and coarse crackling audible over this region. The expectoration was at this time a dark greenish colour, and very foetid. His breath was also very foetid. On the sixty-eighth day the following note was taken:—"On looking at back the left side is seen to be much flattened, a regular depression exists from about half way down scapular nearly to base, left side expands very little during respiration. No râles are here audible, and the respiration is bronchial in character. The expectoration is not so copious, but still very foetid. Patient

Henry W ----. Aged 51. Admitted Nov^r 7th 1865. The 7th day of his Attack.

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Diagram II.

left the Hospital a few days after this very weak, but still gradually improving.

Heart sounds were very weak indeed throughout.

Treatment consisted in this case of the æther mixture at first, and then stimulants and tonics. At one time, about fortieth day, he was taking a mixture containing free chlorine. Counter-irritants were frequently applied to his back, and linseed poultices almost continually.

During the height of the fever, he was taking 12 oz. of brandy daily; and afterwards, till he left the Hospital, about 6 oz. a day, besides beer. (See Diagram II.)

CASE 2.—Henry W—, æt. 51. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
9	1000	1015	Acid	None	21.500	2.500	During lysis.	Reddish-yellow colour; deposit of lithates.
10	680	1020	"	"	20.060	.680		Yellowish red; cloudy deposit.
11	800	1019	"	"	23.600	.600		"
12	740	1018	"	"	19.240	.370		Reddish yellow; deposit of lithates.
13	Lost	1018	"	Trace	.....	.....		"
14	"	1015	"	None	.....	.....		"
15	"	1017	"	"	.....	.....		no deposit.
16	1270	1016	"	Trace	31.115	.635		"
17	Lost	1013	"	"	.....	.....		Yellowish red; cloudy deposit.
18	1180	1017	"	"	31.860	.590		"
19	1020	1017	"	"	32.640	1.580		"
20	800	1020	"	"	26.500	2.000		deposit of lithates.
21	820	1021	"	"	26.650	2.460		"
22	660	1021	"	None	21.450	2.970		"
23	Lost	1026	"	"	.....	.....		Reddish yellow; copious deposit of lithates.
24	570	1022	"	"	18.525	2.565	1st week of convalescence.	Yellowish red
25	580	1024	"	"	17.400	3.190		" cloudy deposit.
26	Lost	1026	"	"	.....	.....		Reddish yellow; copious deposit of lithates.
27	1360	1015	"	"	19.100	5.440	2nd week of convales.	" slight cloudy deposit.
28	600	1022	"	"	16.400	1.800		Yellowish-red colour; slight uric acid deposit.
29	670	1020	"	"	19.095	1.675		" cloudy.
30	730	1018	"	"	15.695	1.825		Reddish yellow; cloudy.

35	530	1017	"	14-045	1-325	3rd week of convales.	Yellowish red ; no deposit.
36	810	1015	"	15-795	2-025	"	" deposit of lithates.
37	800	1014	"	11-200	2-800	"	Reddish yellow ; cloudy ; no deposit.
38	Lost	1015	"	.....	.....	"	Yellowish red "
39	610	1019	"	13-420	1-525	"	Reddish yellow "
40	600	1015	"	12-300	1-800	"	cloudy deposit.
41	Lost	1019	"	.....	.....	"	lithates.
42	490	1018	"	10-780	2-205	"	Yellowish red ; copious deposit of lithates.
43	510	1017	"	9-180	3-570	"	Reddish yellow "
44	910	1014	"	10-920	5-005	"	" no deposit.
45	830	1013	"	11-205	3-735	"	" "
46	1250	1015	"	15-000	6-875	"	Yellow ; cloudy.
47	1880	1011	"	15-040	10-340	"	" "
48	1310	1014	"	15-720	8-515	"	" "
49	1540	1013	"	16-940	8-470	"	" no deposit.
50	950	1017	"	14-250	5-225	"	" cloudy.
51	1680	1012	"	15-960	8-400	"	" "
52	1750	1012	"	16-625	8-750	"	" "
53	1350	1013	"	16-875	7-425	"	" "
54	1620	1011	"	16-380	7-290	"	" "
55	1440	1011	"	13-680	6-480	"	" "
56	1490	1011	"	14-900	8-195	"	Bright yellow ; cloudy deposit.
57	1510	1015	"	15-875	9-060	"	" "
58	1720	1011	"	18-065	10-320	"	" "
59	1050	1015	"	11-550	6-275	"	Pale "
60	1630	1012	"	18-745	8-150	"	Bright "

CASE 2—continued.

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
61	1390	1014	Acid	None	16.680	9.035	7th week of convalescence.	Bright yellow; cloudy deposit.
62	1100	1016	"	"	13.200	7.700		Pale yellow; slight deposit of phosphates on boiling.
63	1380	1013	"	"	15.180	8.970		Bright yellow; cloudy.
64	1210	1015	"	"	15.730	7.260		" "
65	1150	1012	"	"	13.800	5.750		" "
66	1590	1015	"	"	19.875	9.540		Bright yellow; cloudy.
67	920	1015	"	"	13.800	5.520		" slight deposit.
68	1350	1014	"	"	17.550	12.150		cloudy.
69	960	1018	"	"	16.320	8.640		" "
70	1510	1015	"	"	18.120	13.590		" "
71	1360	1013	"	"	16.320	10.880		Pale
72	1780	1019	"	"	24.030	19.580		" slight cloudy deposit.
73	1400	1018	"	"	18.900	.....		" "
74	640	1023	"	"	12.800	6.400		" "
75	1160	1018	"	"	18.560	11.020		" yellow lithates.
76	710	1026	"	"	17.750	7.455		Reddish yellow; lithates.
77	960	1024	"	"	.....	.....		
78	830	1020	"	"	19.120	8.715		Yellow; slight cloudy deposit.
79	1110	1020	"	"	22.200	10.545	9th week of convalescence.	Reddish yellow; lithates.

In this case, therefore, the average daily excretion of urinary water, urea, and chlorides was—

		Amount of urine.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
2	During the lysis.....	945	24·562	·895
	or per kilogramme of body weight .....	.....	·697	·0254
3	During the 1st week of convalescence ...	741	23·862	2·452
	or per kilogramme of body weight .....	.....	·677	·0696
4	During the 2nd week of convalescence ...	590	17·572	2·685
	or per kilogramme of body weight .....	.....	·499	·0762
5	During the 3rd week of convalescence ...	685	13·615	1·919
	or per kilogramme of body weight .....	.....	·386	·0545
6	During the 4th week of convalescence ...	765	11·564	3·865
	or per kilogramme of body weight .....	.....	·328	·111
7	During the 5th week of convalescence ...	1494	15·915	8·160
	or per kilogramme of body weight .....	.....	·451	·231
8	During the 6th week of convalescence ...	1494	15·599	7·953
	or per kilogramme of body weight .....	.....	·443	·225
9	During the 7th week of convalescence.....	1248	15·466	7·682
	or per kilogramme of body weight .....	.....	·439	·218
10	During the 8th week of convalescence ...	1285	17·720	11·873
	or per kilogramme of body weight .....	.....	·503	·337
11	During the 9th week of convalescence ...	95	19·407	9·433
	or per kilogramme of body weight .....	.....	·551	·268
The normal excretion for a man æt. 51 would be per kilogramme of body weight.....		23	·450	·126

CASE 3.—Robert W—, æt. 22, admitted into London Fever Hospital October 7th, 1865, labourer; single. Has always had good health, and was working regularly up to the commencement of his present illness six days ago.

His attack commenced with headache, rigor, and general pains; it came on very suddenly, and he was obliged to give up work this first day of his illness. On admission the seventh day, his skin felt very hot and there was a copious,

rather dark, measly rash on the trunk and limbs. His tongue was covered with a thick clammy brownish fur. He was very restless, continually getting out of bed and wandering a good deal; very thirsty. He was dull and stupid, but could answer questions when roused.

Rash.—Copious, measly, and dusky, on admission: grew very dark and petechial as his disease advanced. It began to fade on the fifteenth day, but remains of it were more or less visible till the twenty-seventh day.

Complexion.—Dusky and flushed; the eyes much suffused and injected, and the lips and teeth covered with sordes till the fourteenth day. It then gradually improved, and was noted as clear and good on the twenty-second day. The expression, at first characteristically typhus, was noted as natural on the twenty-sixth day.

Sleep.—He slept very badly; wandered much and was very restless till fourteenth day. On the sixteenth he slept well. During early convalescence from sixteenth to twenty-fourth day he slept almost continually.

Tongue.—Covered with a thick clammy brown fur when first seen; was dry, brown, and hard, from the tenth to the fourteenth days, then gradually became moist and clean; quite clean on the twenty-first day.

Bowels.—Rather confined. On the ninth day had a simple soap-and-water enema, else opened naturally throughout attack.

Headache, general pains, and thirst, were not complained of after admission.

Appetite.—Noted as returning on the eighteenth day, was not good till the twentieth day.

Mind.—Much low, talkative, delirium, till the fourteenth day, then very drowsy, deaf, and stupid, this lasting more or less till the twenty-fourth day.

Lungs.—Slight dulness at bases from the twelfth to the fifteenth days. Sonorous râles audible over whole back, and at bases mucous râles from tenth to seventeenth days.

Robert W —, Aged 22.—Admitted Oct. 7th 1865. The 8th day of his Illness.

Diagram III.

Heart.—Sounds very weak from the eighth till the nineteenth day, impulse not to be felt during this time.

Patient was up for the first time on the twenty-eighth day, and was then very weak indeed. He left the hospital on the forty-first day, feeling well and strong.

He weighed, on the twenty-ninth day, 44 kilogrammes or 97lbs.; on the thirty-ninth day, 57·3 kilogrammes or 111·5 lbs.

Treatment.

7th day.	R	Æther mixture every four hours.
9th	„	Enema simplex.
11th	„	Mustard poultice to back.
19th	„	Quinine draught three times daily.
23rd	„	Castor oil ʒss at once.

Diet.

7th day.	Low diet with beef-tea.
11th	„ Brandy 6 ozs.
19th	„ Full diet and porter, 1 pint daily. To leave off brandy.
29th	„ Egg and extra bread. (See Diagram III.)

CASE 3.—Robert W—, æt. 22. *Analysis of Urine.*

Weight on 29th day . . 44 kilogrammes.
 " 39th " . . 57·3 "

Day of disease.	Quantity of water.		Specific gravity.	Reaction.	Albumen.	Urea.		Chlorides.	Colour and deposit.			
	C.	G.				Grammes.	Grammes.		Before lysis.	During lysis.	1st week of convales.	2nd week of convalescence.
10	1760		1015	Acid	Trace	45·760	.....					
11	1300		1016	"	"	45·700	.....					
12	Lost		1016	"	"	.....	.....					
13	2945		1007	"	"	51·537	.....					
14	3265		1005	"	"	42·445	.....					
15	1525		1015	"	"	32·825	·762					
16	1475		1015	"	"	44·250	·878					
17	685		1020	"	"	24·345	·342					
18	1125		1022	"	"	37·687	2·250					
19	985		1025	"	"	32·505	4·432					
20	820		1027	"	"	31·570	2·460					
21	760		1027	"	"	28·880	3·280					
22	655		1026	"	"	27·510	2·947					
23	620		1030	"	"	25·420	3·100					
24	630		1030	"	"	25·830	2·662					
25	700		1025	"	"	25·200	3·325					
26	Lost		1025	"	"	.....	.....					

Pale yellow, with deposit of lithates.

" "

Bright yellow

Reddish brown; copious deposit of lithates.

" "

Yellowish red, with slight cloudy deposit.

" no deposit.

In this case the average daily excretion of urinary water, urea, and chlorides has been—

		Amount of urine.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before the lysis	1760	45·760	Not analysed
	or per kilogramme of body weight	30·7	·799	
2	During the lysis.....	2503	46·561	„
	or per kilogramme of body weight	45·2	·812	
3	During the following five days, during which the temperature was rather high.			
	1st week of convalescence	1159	34·322	1·632
	or per kilogramme of body weight	20·2	·599	·018
4	During 2nd week of convalescence	697	27·401	2·962
	or per kilogramme of body weight	12·1	·478	·051
5	During 3rd week of convalescence	1019	23·028	4·460
	or per kilogramme of body weight	17·6	·402	·078
6	During 4th week of convalescence	1579	26·105	12·323
	or per kilogramme of body weight	27·4	·455	·215
The normal amount for this man would be about		1501	33·180	8·21
or per kilogramme of body weight about		·23	·500	·126

CASE 4.—Samuel H—, æt. 38, admitted into the London Fever Hospital, October 10th, 1865, labourer by trade : married. He states that he has been out of work lately and not living well. His present illness commenced six days ago with headache, rigors, and general pains, and for the last two days he has been obliged to keep to his bed. With the exception of some castor oil, three days ago, he has not had any medicine.

On admission his face was much flushed ; his eyes were suffused and injected, the pupils small ; his lips dry, with some sordes on the teeth ; his expression dull and listless. He complained much of frontal headache and aching pain in his eyeballs. His skin was hot, with a distinct typhus rash. The tongue, moist at edges, was getting dry and hard down the centre ; he was very thirsty. He had no cough, and his lungs were clear to the base.

Rash.—Distinct on admission, grew darker as the disease advanced. It began to fade on the fourteenth day, and was quite gone by the eighteenth day.

Samuel H.—. Aged 38.—Admitted Oct. 10th 1865. The 7th day of his Illness.

Diagram IV

Sleep.—Restless and disturbed with more or less delirium, till the thirteenth day, afterwards good.

Complexion.—Dusky and flushed, with a heavy vacant expression till the thirteenth day, natural on the nineteenth day.

Tongue.—Was dry, red, and hard down the centre, till the eleventh day; on the twelfth day it was moist and covered with a yellowish creamy fur, and by the nineteenth day was quite clean.

Bowels.—Were rather confined throughout; patient had a simple enema on the thirteenth day, and took castor oil on the eighteenth day.

Thirst.—Very great till the sixteenth day; was not complained of afterwards.

Appetite.—Patient began to feel hungry on the seventeenth day; his appetite was very good on the nineteenth day.

Headache.—Intense at first, continued bad till the tenth day. None after the twelfth day.

Lungs.—Few; sonorous râles audible, chest and back from eleventh to sixteenth day. Patient did not complain of any cough.

Heart.—Sounds normal throughout; impulse not felt during second week's illness.

Patient was up for the first time on the twentieth day. He left the hospital feeling quite well on the twenty-eighth day.

He weighed, on the twentieth day, 50 kilogrammes or 110 lbs.; on the twenty-eighth 52 kilogrammes or 114·5 lbs.

Treatment.

7th day.	R	Æther mixture ʒj every four hours.
13th	„	Enema simplex.
18th	„	Bark mixture ʒj three times daily.
		Castor oil ʒij.

Diet.

7th day.	Low diet with beef-tea.
18th „	Full diet and porter, 1 pint daily. (See Diag. IV.)

CASE 4.—Samuel H—, æt. 38. *Analysis of Urine.*
 Weight on 20th day . . . 50 kilogrammes.
 ” 28th day . . . 52 ”

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.	Before lysis.	Colour and deposit.
	C. C.				Grammes.	Grammes.		
9	955	1022	Acid	None	32·947	.....		
10	1140	1020	”	”	35·340	.....		
11	850	1017	”	”	24·225	.....		
12	1150	1011	”	”	25·300	.....		
13	2440	1012	”	”	50·020	1·220		
14	820	1015	”	”	21·730	·615		
15	790	1016	”	”	22·120	·395		
16	2040	1015	”	”	49·980	2·040		
17	1900	1014	”	”	38·950	2·850		
18	1230	1014	”	”	27·675	2·460		
19	1045	1015	”	”	26·125	2·873		
20	640	1023	”	”	20·800	2·560		Reddish-brown colour, with copious deposit of lithates.
21	750	1018	”	”	22·875	3·750		Reddish yellow; some lithates.
22	470 ¹	1015	”	”	.....	.....		Pale yellow, with slight cloudy deposit.
23	1560	1012	”	”	24·960	6·240		Yellow colour. No deposit.
24	1760	1012	”	”	25·620	7·920		”
25	1520	1015	”	”	22·800	8·260		”
26	1560	1016	”	”	23·400	10·140		”
27	980	1011	”	”	17·640	6·370		Deposit of lithates.
28	1680	1011	Alkaline	”	20·160	9·240		Bright yellow. No deposit.

¹ Some urine lost this day.

In this case the average daily excretion of urinary water, urea and chlorides, has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before the lysis	1225	31·954	·803
	or per kilogramme of body weight	23·5	·605	·015
2	During the lysis.....	1401	32·970	2·123
	or per kilogramme of body weight	26·9	·634	·041
3	During the 1st week of convalescence (8 days)	1306	22·282	6·810
	or per kilogramme of body weight	25	·428	·131
The normal amount in this case would be per kilogramme of body weight about...		23	·500	·126

CASE 5.—W. B—, æt. 28, admitted into the London Fever Hospital, March 2nd, 1866. States that he has been ill five days.

On admission his skin was hot, and there was a distinct, rather dark typhus rash. His tongue was furred, and dry at the tip. The bowels had been open in the morning. He was complaining of much headache and pains all over him, and of great thirst. He had some cough, but his lungs were clear to bases. He was restless and wandering slightly.

Rash.—Copious on admission, grew dark and petechial as the disease advanced. It began to fade from the limbs on the eleventh day, from the trunk on the twelfth day, and was gone by the fifteenth day.

Sleep.—His nights were restless and disturbed, with much delirium till the twelfth day. On the thirteenth and afterwards he slept well.

Aspect.—Vacant and listless till twelfth day, good on the sixteenth day. Complexion muddy and sallow, with suffused and injected eyes, and slight sordes on lips and teeth till twelfth day.

Tongue.—Moist, and covered with a thick yellowish fur till the eleventh day. On the twelfth and thirteenth days it

was dry and brown, on the fourteenth improving, and on the sixteenth day was fairly clean.

Bowels.—Loose on seventh and eighth days, afterwards confined (by medicine) ; open freely by oil on eighteenth day.

Headache.—Very severe at first, was only occasional after the eighth day.

Nasty taste in mouth was much complained of till the thirteenth day.

Thirst.—Very great at first, was complained of slightly till the sixteenth day.

Appetite.—Noted a returning on the fourteenth ; was very good by the sixteenth day.

Cough.—Never very troublesome.

Lungs.—Few coarse crepitant râles, audible at left base from fourteenth to seventeenth days. No particular dulness at left base, local fremitus the same at both bases.

Heart.—Sounds normal, rather weak.

Patient got up for the first time on the twenty-second day. He left the Hospital feeling quite well and strong on the fortieth day.

His weight on the thirty-fourth day was 52·05 kilogrammes, or 136·5 lbs. ; on the fortieth day was 63·4 kilogrammes, or 139·5 lbs.

Treatment.

6th day.	℞	Mist. Camphoræ ʒj, 4th horis.	Mustard poultice to back.
7th	„	Tinct. Catechu ʒj, Mist. Camph. ʒj,	three times daily.
11th	„	Mist. Camphoræ ʒj, 4th horis.	Repeat mustard.
14th	„	Bark mixture,	three times daily.
17th	„	Castor oil ʒj,	statim.

Diet.

6th day.	Low, beef-tea diet.
14th	„ Full diet. Porter Oj.
17th	„ One egg daily. (See Diagram V.)

William B — Aged 2nd 1866. The 6th day of his Illness.

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Diagram V.

CASE 5.—William B—, æt. 28. *Analysis of Urine.*

Weight on 34th day . . 62 kilogrammes.

" 40th day . . 63·4 "

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.	Colour and deposit.	
							Before lysis.	During lysis.
8	C. C. 590	1023	Acid	Slight trace	Grammes. 25·370	Grammes. ·147	Yellowish red; copious lithates.	
9	420 ¹	1027	"	" ¹	17·220	·105	"	"
10	Lost	1024	"	None	Lost	Lost	"	"
11	1320	1018	"	"	48·840	·660	"	"
12	1320	1017	"	"	42·240	1·320	Reddish yellow;	"
13	940	1020	"	"	21·550	·940	"	"
14	560 ¹	1020	"	"	.....	.....	"	"
15	900	1022	"	"	29·700	1·350	Yellowish red; cloudy deposit; and some uric acid.	"
16	1070	1022	"	"	31·030	2·140	" lithates.	"
17	950	1025	"	"	29·450	2·850	" cloudy.	"
18	810 ¹	1025	"	"	.....	.....	" deposit of lithates; and uric acid.	"
19	780 ¹	1020	"	"	.....	.....	"	"
20	950	1018	"	"	19·950	5·225	Reddish yellow; clear.	"
21	1560	1013	"	"	19·500	8·580	Yellow;	"
22	1500	1012	"	"	21·000	8·250	Reddish yellow, "	"

¹ Some urine lost on these days.

CASE 5—continued.

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
23	1320	1017	Acid	None	21.945	9.310	2nd week of convalescence.	Reddish yellow; clear.
24	1060	1021	"	"	22.790	9.540		Yellow; "
25	1680	1017	"	"	28.560	12.600		Reddish yellow; slight deposit of lithates.
26	2320	1010	"	"	23.200	11.600		Bright yellow; clear.
27	1440	1017	"	"	27.360	10.080		Yellow; "
28	2160	1013	"	"	28.080	17.280		Bright yellow "
29	1300	1021	"	"	26.000	13.650		Yellow; "
30	1540	1017	"	"	27.720	15.400		"
31	2300	1016	"	"	30.800	18.800	3rd week of convalescence.	Bright yellow; "
32	1560	1020	"	"	28.860	7.800		Yellow; clear; uric acid deposit.
33	1000	1022	"	"	26.000	8.500		"
34	1540	1021	"	"	32.340	12.320		"
35	2200	1013	"	"	27.500	15.510		Bright yellow; clear; uric acid deposit.
36	2170	1016	"	"	.....	19.530		"
37	2680	1010	"	"	.....	16.080	4th week of conv.	"
38	2020	1016	"	"	.....	14.140		Yellow; "
39	1430	1019	"	"	.....	12.870		"
40	2350	1012	"	"	.....	16.450		"

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (only one day's urine or per kilogramme of body weight	590	25·370 ·400	·147
2	During lysis (four days' urine)..... or per kilogramme of body weight	1120	35·582 ·561	·875 ·001
3	During 1st week of convalescence or per kilogramme of body weight	1206	24·186 ·381	5·409 ·085
4	During 2nd week of convalescence or per kilogramme of body weight	1611	24·410 ·400	12·008 ·189
5	During 3rd week of convalescence or per kilogramme of body weight	1758	28·870 ·453	13·980 ·220
6	During 4th week of convalescence or per kilogramme of body weight	2120		14·885 ·234
The normal rate per kilogramme is about.		1500	·500	·126

CASE 6.—William B—, æt. 27, admitted into the London Fever Hospital, November 7th, 1865. Is a strong healthy-looking man, and has never been laid up with any serious illness. His present attack commenced six days before his admission with headache, rigors, and general pains. When first seen, November 7th (seventh day of his illness), his skin was hot, and there was a copious rather dark typhus rash on trunk and limbs. His tongue was moist and covered with a thick creamy fur. He was restless and wandering slightly. His face was dusky and flushed. He did not complain of any pain, but was very thirsty.

Rash.—Copious and dark on admission, became quite petechial in character towards the end of the disease. It began to fade the twelfth day, and was quite gone by the fifteenth day.

Sleep.—Restless and disturbed, with much delirium till the twelfth day. Slept well on thirteenth.

Complexion.—Dusky and flushed with the suffused and injected eyes, and dry lips slightly covered with sordes till

the eleventh day; clearer on the twelfth and natural on the sixteenth day. The expression at first vacant and listless, was good on the sixteenth day.

Tongue.—Dry and brown on the ninth and tenth days, moist and thickly furred on the eleventh day. Was quite clean by the seventeenth day.

Bowels.—Open daily, rather relaxed at first.

Headache.—Not complained of after admission.

Thirst.—Great to the thirteenth day.

Appetite.—Returning on fourteenth day, good on sixteenth day.

Mind.—Confused and stupid, with some deafness to the tenth day. Pretty clear on thirteenth day.

Lungs.—Few bronchitic râles audible at bases tenth and eleventh days; no dulness on percussion elsewhere. Respiration was normal.

Heart.—Sounds weak but normal throughout. Impulse could not be felt during second week.

Perspiration.—More or less free from the fifteenth to the thirtieth days, with some sudaminæ on the chest and abdomen.

During convalescence patient suffered from boils and occasional sore throat, which caused sudden and high elevations of temperature.

Patient was up for the first time on the thirtieth day. He left the Hospital the thirty-sixth day, feeling well and strong.

His weight on the thirtieth day was 54·5 kilogrammes, or 120 lbs.; on the thirty-sixth day was 58 kilogrammes, or 127·5 lbs.

Treatment.

7th day.	R	Mist. Camphoræ ʒj, 4th horis. Sedative draught at night.
12th	„	Bark mixture, three times daily.
20th	„	Poultice to boil on buttock.
22nd	„	Quinine draught, three times daily. Gar- garisma aluminis to be frequently used.

William B. s. Aged 27.—Admitted Nov. 7th 1865. The 7th day of his Attack.

Diagram VI.

Diet.

7th day.	Low beef-tea diet.
14th „	Full diet, and porter Oj.
20th „	Low beef-tea diet and 3 oz. of wine.
22nd „	Fish and middle diet. To leave off wine.
29th „	Chop and middle diet.
31st „	Low beef-tea diet.
32nd „	Fish and middle diet. (See Diagram VI.)

CASE 6.—William B—, æt. 27. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea. Grammes.	Chlorides. Grammes.		Colour and deposit.
9	C. C. Lost	1015	Acid	Slight trace	.....	.....	Before lysis.	Reddish yellow; cloudy deposit.
10	1365	1017	"	None	23.887	.682		Yellowish red; cloudy.
11	Lost	1011	"	"	.....	.....		Reddish yellow; cloudy with deposit.
12	1130	1017	"	"	37.290	.567		" no deposit.
13	970	1021	Neutral	"	34.435	.485		" lithates.
14	1050	1018	Acid	"	32.550	.525		Yellow; no deposit.
15	1060	1018	"	"	26.500	1.325		Reddish yellow; no deposit.
16	820	1018	"	"	22.140	1.435		Yellow; cloudy deposit.
17	1070	1017	"	"	33.705	2.675		" "
18	1270	1017	"	"	33.020	5.715		Yellowish red; slight cloudy deposit.
19	830	1023	"	"	26.560	6.225		" "
20	730	1022	"	"	23.360	2.920		Reddish yellow; cloudy deposit; phosphates.
21	860	1022	"	"	27.950	5.160		" no deposit; phosphates less.
22	1140	1019	"	"	26.220	6.840	1st week of convalescence.	"

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (only 1 day's urine obtained)...	1365	23·887	·682
	or per kilogramme of body weight .....	.....	·412	·0117
2	During lysis (4 days' urine).....	1052	32·694	·723
	or per kilogramme of body weight .....	.....	·563	·012
3	During the 1st week of convalescence ...	960	27·565	4·424
	or per kilogramme of body weight .....	.....	·475	·076
4	During the 2nd week of convalescence ...	1009	24·442	6·486
	or per kilogramme of body weight .....	.....	·440	·112
5	During 3rd week of convalescence	1841	20·786	10·408
	or per kilogramme of body weight .....	.....	·358	·179

CASE 7.—Louis S—, æt. 21, admitted into the London Fever Hospital January 1st, 1866; is a labourer. Has always enjoyed very good health; he has been ill eight days; says that his attack commenced with rigor, headache, and general pains, felt at first as if he had a very bad cold.

On admission (ninth day of his illness) his skin was very hot, and there was a copious, dark, typhus rash on trunk and limbs; his tongue was dry and brown down the centre; he was very thirsty; he did not complain of any pain, and he was rather deaf and stupid.

Rash.—Copious and dark on admission, became quite petechial about the end of the second week. It began to fade on the eleventh day, but was not entirely gone till the nineteenth day.

Sleep.—Restless and disturbed with occasional moaning and some delirium till the twelfth day, better afterwards.

Complexion and Expression.—Characteristic of typhus, with much sordes on the lips and teeth. Began to improve on the fifteenth day, and was natural on the twentieth day.

Tongue.—Dry and brown down the centre till the eleventh day; covered with a thick yellowish clammy fur on the twelfth day, cleaning on the thirteenth day, clean on the nineteenth day.

Bowels.—Rather loose at first, were open daily during acute stage.

Headache.—None after admission.

Thirst.—Very great at first, was complained of more or less till the nineteenth day.

Nasty taste in mouth, very bad till the twelfth day.

Appetite.—Returning on the seventeenth day, good on the nineteenth day.

Mind.—Very dull and stupid, and very deaf till the fourteenth day; he continued heavy and restless, sleeping almost all day and night, with exception of meal times, till seventeenth day, then was much more sensible and scarcely at all deaf.

Cough.—Very troublesome between the twelfth and fifteenth days.

Lungs.—Numerous sonorous and large mucus râles were audible at bases from the tenth to the seventeenth day, and more or less sonorous râles over whole back, slight dulness on percussion at bases.

Heart.—Sounds very weak, and impulse indistinct till the seventeenth day.

Patient was up for the first time on the twenty-sixth day. He was discharged the thirty-third day feeling quite well and strong.

His weight on the nineteenth day was 47·5 kilogrammes or 104·5 lbs; on the thirty-third day was 56 kilogrammes or 123 lbs.

Treatment.

9th day.	R	Æther draught ʒj, 4tis horis.
12th	,,	Mustard to back.
15th	,,	Repeat mustard poultice.
19th	,,	Bark mixture three times daily.
21st	,,	Castor oil ʒj, at once.

Diet.

9th day.	Low diet, with beef-tea, brandy 4 oz.
19th	,, Fish and middle diet; porter Oj.
27th	,, Full diet. (See Diagram VIII.)

CASE 7.—Lewis S—, æt. 21. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.	Before lysis.	
11	Lost	1021	Acid	Trace	.....	.....		Raddish yellow; clear.
12	1200	1018	"	"	39.600	Trace		" " no deposit.
13	1240	1016	"	"	37.820	"		Yellow " "
14	1510	1019	"	None	49.830	"		Yellowish red, with lithateæ.
15	1050	1022	"	"	36.750	"		" " "
16	1480	1020	"	"	54.020	"		" " clear; no deposit.
17	980	1024	"	"	34.300	.980		" " "
18	1540	1013	"	"	36.190	5.390		" " "
19	1940	1013	"	"	37.860	5.820		Raddish yellow; clear.
20	1500	1010	"	"	30.000	4.500		Yellow " "
21	1190	1017	"	"	26.180	5.950		" " "
22	930	1018	"	"	26.970	3.720		Yellowish red " "
23	780	1019	"	"	23.400	3.120		" " light cloudy deposit.
24	1340	1017	"	"	32.820	6.080		" " clear.
25	1460	1017	"	"	33.580	8.080		Yellow; slight cloudy deposit.
26	1790	1013	"	"	32.220	8.950	Last week of convalescence.	

Patient's weight on the 9th day was 47·5 kilogrammes or 104·5 lbs.; on the 33rd day was 56 kilogrammes or 123 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (2 days' urine)	1220	38·710	Trace
	or per kilogramme of body weight .....	.....	·691	
2	During lysis	1417	41·491	4·063
	or per kilogramme of body weight .....	.....	·741	·0725
3	During the 1st week of convalescence.....	1284	29·310	5·757
	or per kilogramme of body weight .....	.....	·523	·1028
	The normal excretion per kilogramme of body weight would be about .....	.....	·005	·126

CASE 8.—George W—, æt. 18, labourer, admitted into the London Fever Hospital October 25th, suffering from scarlet fever; from this attack he began to coalesce October 30th, and was removed to the Convalescent Scarlet Ward on November 3rd. Whilst there, after he had quite recovered from his attack of scarlet fever, he contracted typhus fever. Says that he did not feel so well on November 25th, he felt cold and chilly, and had some headache and general aching pains; he gradually became worse, his appetite entirely failed, he complained of great thirst and passed bad and restless nights.

On the 29th, fifth day of disease, a distinct typhus rash was visible on the backs of hands and arms, and slightly on the trunk; his headache and general pains, though better, were still bad, he complained of much thirst; his tongue was moist with white fur on dorsum, red at tips and edges; the bowels had been opened daily, not at all loose; the lungs and heart sounds were normal, and his mind quite clear.

Rash.—On the fifth day the rash was copious on the backs of hands and arms, slight on the trunk. On the sixth day a

copious rash was everywhere visible, and it gradually grew darker as the disease advanced. It began to fade on the ninth day and was entirely gone on the fifteenth day.

Sleep.—He passed restless and disturbed nights up to the 16th, with little low muttering delirium each night; on the 15th he was disturbed by noisy patients in the same ward and wandered much; on the 17th and afterwards he slept well.

Complexion.—Was muddy and flushed, with suffused and injected eyes and more or less sordes on lips and teeth till thirteenth day; then gradually improved, and on the 20th it was noted as quite clear. Expression characteristically typhus at first, gradually cleared up, and was natural on the twentieth day.

Tongue.—Moist and red at tips and edges with white fur on dorsum, at first, was dry, and brown on the eighth day and continued so to the sixteenth; was quite clean on the nineteenth day.

Bowels.—Were open throughout without medicine, rather loose on the eighth day.

Headache and general pains intense at first, were not complained of after the sixth day. He complained much of nasty taste in his mouth till the eighth day.

Mind.—Patient was in a low heavy and stupid state from the ninth to the fifteenth day; on the nineteenth his mind was pretty clear, and he could answer questions readily.

Appetite.—Noted as returning on the seventeenth, and was very good on the nineteenth day.

Cough.—Slight from the thirteenth to the twenty-first day.

Lungs.—Few bronchitic râles with some mucous râles at bases audible at the end of the second and beginning of the third week. Quite clear on the twenty-second day.

Heart.—Sounds normal throughout. The impulse and first sound rather weak from the eighth to the fifteenth days.

Patient got up for the first time on the twenty-sixth day and convalesced rapidly afterwards.

George W—, Aged 18.—Admitted Nov. 29th 1865. The 5th day of his Illness.

Diagram VIII.

The Temperature was taken regularly Night & Morning, till the 49th day. It ranged between 97° & 98°.

Patient's weight on the twenty-seventh day, was 93 lbs. or 43·3 kilogrammes; on the thirty-seventh day, 102·5 lbs. or 46·6 kilogrammes; on the fiftieth day, 113 lbs. or 51·4 kilogrammes.

Treatment.

5th day.	℞	Mist. Camphoræ ʒj, 4tis horis.
8th	„	Mist. Cretæ cum Catechu ʒj subinde.
14th	„	Mustard to back.
17th	„	Haust. Cinchonæ ʒj, ter die.

Diet.

5th day.	Low, beef-tea.
17th	„ Full diet and porter Oj.

(See Diagram VIII.)

CASE 8.—George W—, æt. 18. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
7	740	1028	Acid	None	26.640	2.960	Before lysis.	Yellowish red, with slight cloudy deposit.
8	470 ¹	1029	"	Trace	16.920	.940		"
9	470 ¹	1022	"	None	16.920	.235		" no deposit.
10	1110	1021	"	"	34.410	.555		" cloudy deposit.
11	860	1019	"	"	24.940	Trace		" Reddish yellow; no deposit.
12	1115	1020	"	"	35.680	"		"
13	1300	1016	"	"	31.220	.650	During lysis.	Yellow; cloudy; no deposit.
14	1570	1012	"	"	25.120	3.925		"
15	870 ¹	1018	"	"	20.010	1.305		"
16	910	1025	"	"	25.935	1.365		" Reddish yellow; deposit of lithates.
17	Lost	1023	"	"	.....	.....		" cloudy; no deposit.
18	470	1027	"	"	16.110	1.645	1st week of convalescence.	" deposit of lithates.
19	960	1018	"	"	19.200	5.280		Yellow; slight cloudy deposit.
20	780 ¹	1016	"	"	14.820	1.950		" cloudy, with deposit.
21	740	1020	"	"	16.650	2.960		" deposit of lithates; and some phosphates.
22	650	1017	"	"	13.650	2.600		" Reddish yellow; no deposit.
23	730	1016	"	"	13.870	2.920		"

24	590	1022	"	"	3245	2nd week of convalescence.	"	copious deposit of lithates.
25	640	1020	"	"	3200		"	no deposit.
26	400	1028	"	"	2800		"	"
27	500		"	"				
28	650	1024	"	"	5850		Yellowish red, with cloudy deposit.	
29	580	1022	"	"	5220		Reddish yellow; deposit of lithates.	
30	920	1017	"	"	5080		Yellow; cloudy deposit.	
31	820	1015	"	"	4100		"	"
32	710	1020	"	"	4615		"	no deposit.
33	660	1015	"	"	3960		"	"
34	830	1015	"	"	5810		"	"
35	1190	1011	"	"	5950		Pale yellow; cloudy; no deposit.	
36	1170	1012	"	"	4680		"	"
37	1170	1011	"	"	4095		Bright yellow; no deposit.	
38	1200	1010	"	"	6000		"	light deposit.
39	1760	1010	"	"	7900		"	no deposit.
40	1310	1008	"	"	6550		"	"
41	2150	1010	"	"	8600		"	"
42	1400	1016	"	"	10500		Yellow; clear.	
43	2150	1010	"	"	9675		"	"
44	2140	1015	"	"	19260		Bright yellow; clear.	
45	1990	1012	"	"	17910		"	"
46	2530	1013	"	"	25300		"	"
47	1700	1012	"	"	14450		"	"
48	1570	1015	"	"	10205		Yellow	"
49	1330	1016	"	"	9975		"	"

¹ Some of urine lost each of these days so marked.

Weight on the 27th day 43·3 kilogrammes or 93 lbs.; on the 50th day 51·4 kilogrammes or 113 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (4 days' urine)	·956	31·667	1·757
	or per kilogramme of body weight .....	.....	·616	·0339
2	During lysis	·1260	25·569	1·811
	or per kilogramme of body weight .....	.....	·497	·0352
3	During 1st week of convalescence	·710	15·717	2·892
	or per kilogramme of body weight .....	.....	·305	·0523
4	During 2nd week of convalescence	·611	14·295	4·202
	or per kilogramme of body weight .....	.....	·278	·0822
5	During 3rd week of convalescence	·935	14·043	4·744
	or per kilogramme of body weight .....	.....	·282	·0923
6	During 4th week of convalescence	·1730	20·175	9·783
	or per kilogramme of body weight .....	.....	·392	·190
7	During 5th week of convalescence	·1824	24·924	15·568
	or per kilogramme of body weight .....	.....	·485	·302
The average normal excretion per kilo-gramme of body weight would be about		.....	·500	·126

CASE 9.—Thomas S—, æt. 13. Errand boy. Admitted into the London Fever Hospital on March 14th. States that he has been ill for two days. The attack commenced whilst at work with headache, rigors, and general pains. He has always enjoyed good health, and is a well-made healthy looking boy.

On admission patient was still suffering much from headache, and pains in back and limbs. His mind was quite clear. His skin was hot and mottled, but there was no distinct typhus rash. The tongue was moist and thickly furred. The bowels were open the day before admission. The lungs and heart were quite healthy. He was rather restless, face was slightly flushed, and he complained of much thirst.

Rash.—A copious typhus rash appeared on the fifth day, which grew dark and petechial as the disease advanced. It began to fade on the tenth, and was quite gone on the fifteenth day.

Sleep.—He slept badly, and was very restless, with more or less delirium till the ninth day; on the tenth day he slept better, but on the eleventh, being disturbed by a wildly delirious patient in the same ward, the delirium returned, and continued with more or less severity till the thirteenth day.

Complexion.—Dusky and flushed, with suffused and injected eyes, and some slight sordes on lips and teeth till the thirteenth day. Quite clear on the eighteenth day.

Expression.—Dull, vacant, and listless at first, began to improve on the thirteenth, and was quite natural on the eighteenth.

Tongue.—With the exception of the twelfth day, when it was dry and brown down the centre, the tongue was moist throughout, thickly coated with yellowish creamy fur during the early part of the disease. First noted as "clean" on the seventeenth day.

Bowels.—Open, without medicine, throughout; were rather loose from the fifth to the seventh days, and on the eleventh and twelfth days.

Headache.—Intense at first, lasted more or less till the seventh day. None afterwards.

Nasty taste in mouth much complained of till the ninth day.

Appetite.—Noted as returning on the fifteenth, good on the nineteenth day.

Cough.—Rather troublesome from the fifth to the seventeenth days. Expectoration frothy, and slightly mucopurulent.

Lungs.—Never any dulness chest or back. Numerous sonorous and sybilant râles audible, chiefly at back, from fifth to seventeenth days.

Heart.—Sounds were healthy throughout; rather weak at first.

Patient got up for the first time on the twentieth day.

Weight.—On the twenty-sixth day patient weighed 32·5 kilogrammes, or 71·5 lbs.; on the thirtieth day he weighed 34·5 kilogrammes, or 76 lbs.

Treatment.

3rd day.	℞	Mist. Camphoræ ʒj, every four hours.
5th „		Mist. Cretæ ʒj, Tinct. Catechu ʒj. Three times daily.
8th „		Mustard poultice to back. Mist. Camphoræ as before.
11th „		Rep. Haust. Cretæ and Catechu.
13th „		Rep. Mustard poultice to back and chest.
15th „		Hydrochlorate of Cinchonine gr. 1, Dilute Hydrochloric acid ℥x, Treacle ʒss, Aqua ad ʒj. Fiat haust., t. d. s.

Diet.

3rd day.	Low, beef-tea.
15th „	Middle diet and fish.
20th „	Full diet, and porter Oj. (See Diagram IX.)

Thomas S —, Aged 13.— Admitted March 13th 1866. The 3rd day of his Illness.

Diagram IX.

CASE 9.—Thomas S—, æt. 13. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
5	630	1031	Acid	None	26.460	1.260	Before	Reddish yellow, with lithates.
6	490	1029	"	"	20.580	.785		"
7	790	1025	"	"	27.650	.790		"
8	1020	1019	"	"	28.560	.510		Yellowish red; clear; no deposit.
9	1100	1015	"	"	28.050	.550		"
10	Lost	1014	"	"	.....	.....		"
11	830	1015	"	"	22.410	.415		Reddish yellow; clear.
12	670	1016	Alkaline	"	17.420	.335		" copious deposit of lithates.
13	Lost	1016	"	"	.....	.....		"
14	"	1010	Acid	"	.....	.....		"
15	800	1013	"	"	13.600	3.200		Yellow; clear; no deposit.
16	1050	1010	"	"	15.225	1.050		" cloudy.
17	930	1016	"	"	20.460	3.720		" clear.
18	1160	1015	Alkaline	"	20.880	5.800		" cloudy.
19	1090	1016	Acid	"	21.800	5.450		Bright yellow; cloudy.
20	1100	1016	Alkaline	"	23.100	4.400		"
21	1370	1011	"	"	21.235	4.110		"
22	1340	1011	Neutral	"	.....	5.360		Yellow; clear.
23	1740	1009	Acid	"	.....	4.350		" slightly cloudy.
24	1320	1007	"	"	.....	3.960		Bright yellow; clear.
25	1560	1010	"	"	.....	6.240		"
26	1740	1008	"	"	19.140	6.960	2nd	cloudy.
27	1860	1009	"	"	18.600	4.650	week of conval.	"

Weight on the 26th day 32·5 kilogrammes or 71·5 lbs.; on the 30th day 34·5 kilogrammes or 76 lbs.

The average daily excretion of urinary water, urea, and chlorides has been in each period—

		Amount of water.	Urea.	Chlorides
		C. C.	Grammes.	Grammes.
1	Before lysis (4 days' urine)	·732	25·812	·823
	or per kilogramme of body weight .....	.....	·748	·0238
2	During lysis	·934	19·712	2·153
	or per kilogramme of body weight .....	.....	·571	·0624
3	During 1st week of convalescence	·1326	22·045	4·771
	or per kilogramme of body weight .....	.....	·639	·138
4	During 2nd week of convalescence	·1720	18·870	5·283
	or per kilogramme of body weight .....	.....	·547	·153

CASE 10.—Joseph L—, æt. 17, admitted into the London Fever Hospital, October 30th, 1865. A strong well-made boy. Works at brick-laying. His present illness commenced seven days before admission with pain in his chest, and shortness of breath, followed by shivering, headache, and pains all over.

On admission his skin was hot, and covered with a pinkish typhus rash. His face was much flushed, and his expression rather dull. His tongue was moist and furred down the centre. His bowels had not been open for two days. He was complaining much of headache and thirst. He had a slight cough, but the lungs were clear to bases, and the heart sounds were normal.

Rash.—Gradually became darker; it began to fade on the twelfth, and was quite gone by the seventeenth day.

Sleep.—Restless and disturbed, with much delirium, from the tenth to the thirteenth days; he slept well on the fourteenth day, and afterwards.

Complexion.—Dusky and flushed at first; was pallid on the tenth, and not clear and good till the twentieth. No sordes on lips throughout. Eyes much suffused and injected

Joseph L., Aged 17.—Admitted Oct. 30th 1865. The 8th day of his Illness.

Diagram X.

at first. The expression, dull to the thirteenth, was good by the eighteenth day.

Tongue.—Was dry and brown from the ninth to the fourteenth days. It was moist at edges on the fifteenth, and by the eighteenth was quite clear.

Bowels.—Confined generally; were opened by castor oil on the eleventh day. On the twenty-first day they were rather loose.

Thirst.—Very great, and much complained of till the twelfth day.

Appetite.—Noted as returning on the fourteenth, was good on the sixteenth day.

Headache.—Very bad indeed till the eleventh day, afterwards not complained of.

Mind.—Much confused till the fourteenth day. He was very deaf, and could not, when roused, answer questions truly up to the fourteenth day. Deafness lasted more or less till the eighteenth day.

Cough.—Slight throughout; a few bronchitic râles were audible at bases from the eighth to the thirteenth day.

Heart.—Sounds normal throughout.

Patient was up for the first time on the twentieth day. He left the Hospital feeling well and strong on the thirty-fifth day.

He weighed on the twenty-second day 35·7 kilogrammes, or 78·5 lbs.; on the thirty-eighth day 40 kilogrammes, or 88 lbs.

Treatment.

8th day.	R	Mist. Camphoræ ʒj, every four hours.
11th	„	Castor oil ʒj, at once. Mustard to back.
15th	„	Bark mixture ʒj, three times daily.
21st	„	Chalk and Catechu mixture every now and then.

Diet.

8th day.	Low diet, with beef-tea.
15th	„ Full diet and porter Oj.
21st	„ One egg. (See Diagram X.)

CASE 10.—Joseph L—, æt. 17. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
10	910	1018	Acid	None	26.390	1.365	Before lysis.	Yellowish red; clear.
11	1140	1014	"	"	26.225	1.710	"	Reddish yellow; no deposit.
12	925	1014	"	"	19.887	1.156	"	"
13	790	1016	"	"	15.010	.790	"	"
14	1365	1008	"	"	17.745	1.365	During lysis.	"
15	1210	1007	"	"	13.310	1.210	"	Yellow
16	835	1013	"	"	14.195	1.252	"	Reddish yellow
17	1100	1010	"	"	14.850	1.650	"	Yellow
18	1110	1017	"	"	17.205	1.665	"	Yellowish red
19	930	1015	Alkaline	"	17.670	3.720	"	Yellow, with cloudy deposit.
20	1120	1017	Acid	"	22.400	6.720	1st week of convalescence.	Reddish yellow, with slight cloudy deposit.
21	380 ¹	1016	"	"	.....	.....	"	"
22	580	1022	"	"	15.660	4.060	"	Yellowish-red
23	620	1024	"	"	17.360	6.200	"	Reddish-yellow; deposit of lithates.
24	950	1022	"	"	19.950	9.500	"	Yellow, with cloudy deposit.
25	1480	1020	"	"	22.200	17.760	"	Pale yellow, with slight cloudy deposit.
26	1710	1018	"	"	25.650	20.355	"	Bright yellow
27	2440	1015	"	"	26.840	19.520	"	Pale
28	1575	1016	"	"	22.050	15.750	"	Bright
29	1890	1014	"	Trace	26.460	17.955	"	Pale
30	830	1020	"	"	17.430	7.470	"	Yellow
31	870	1023	"	None	20.013	10.875	"	Bright yellow
32	1030	1020	"	"	22.755	14.045	"	"
33	1300	1017	"	"	23.400	15.600	"	Pale yellow
34	1680	1019	"	"	25.200	20.160	"	" no deposit.
35	1550	1023	"	"	31.000	15.500	3rd week of convalescence.	Yellow, with slight cloudy deposit.

¹ Some urine lost this day.

Weight on the 22nd day 35·7 kilogrammes or 78·5 lbs. ; on the 38th day 40 kilogrammes or 88 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (2 days' urine) or per kilogramme of body weight	·1025	26·302 ·658	1·587 ·0396
2	During the lysis..... or per kilogramme of body weight	·1025	16·029 ·400	1·354 ·0338
3	During 1st week of convalescence or per kilogramme of body weight	·910	17·524 ·433	4·002 ·100
4	During 2nd week of convalescence or per kilogramme of body weight	1553	22·940 ·523	15·472 ·3868
5	During 3rd week of convalescence or per kilogramme of body weight	1326	24·473 ·612	15·236 ·3809

CASE 11.—John J—, æt. 30, admitted into the London Fever Hospital March 1st, 1866; is a labourer. Has always had very good health, but lately having been out of work has not lived well. His present illness commenced six days before his admission. He is now, March 1st (seventh day of attack), in a confused and stupid state, not complaining of any pain, rather deaf; his skin is hot and there is a distinct and copious typhus rash visible; his tongue is dry and red; he has been rather sick; he complains of thirst; he has no cough and his lungs are clear to bases: heart sounds are weak but normal.

Rash.—Copious, on admission became gradually darker. It began to fade on the twelfth day and was entirely gone by the seventeenth day.

Sleep.—Restless, with more or less wandering at night, till the eleventh day. After this he slept well.

Complexion and Expression.—Thoroughly typhus, with sordes on lips and teeth till twelfth day, then gradually improved, and was natural on the sixteenth day.

Tongue.—Dry, smooth, red, and fissured, till eleventh day,
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moist at edges on thirteenth day, slight remains of fissure seen to the twentieth day.

Bowels.—Rather confined throughout. On the nineteenth and twenty-ninth days castor oil was taken.

Headache.—None after admission.

Nasty taste in mouth much complained of till the eleventh day, then less, only noticed on waking.

Thirst.—Intense at first, was complained of more or less till the thirteenth day.

Appetite.—Patient complained of feeling hungry on the seventeenth day. His appetite was very good on the twenty-first day.

Mind.—Confused, dull, and very deaf till the eleventh day, pretty clear on the fourteenth day; some deafness lasted till the twenty-first day.

Cough.—Slight and occasional from the eighth till the fifteenth day. Lungs were clear throughout.

Heart.—The impulse could not be felt from the eighth to the thirteenth day. The sounds were normal throughout rather weak at first, especially the first sound.

There was slight desquamation noted from the twenty-first to the thirtieth days.

Patient got up for the first time on the twenty-fifth day. He left the hospital feeling pretty strong and well on the thirty-second day.

His weight, on the twenty-seventh day, was 47·3 kilogrammes, or 104 lbs.; on the thirty-second day was 48·1 kilogrammes, or 106 lbs.

Treatment.

7th day.	R	Mist. Camphoræ ʒj. 4tis horis.
15th	„	Bark mixture three times daily.

Diet.

7th day.	Low, beef-tea diet.
11th	„ 1 egg, and brandy 4 oz.
18th	„ Fish and middle diet.
22nd	„ Full diet, and porter Oj; omit brandy. (See Diagram XI.)

CASE 11.—John J—, æt. 30. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.	Before lysis	
9	720	1015	Acid	None	19.440	.540		Yellowish red; cloudy; no deposit.
10	1240	1015	"	Trace	27.280	.620		"
11	1110	1016	"	Alb. 1/16 ¹	27.195	.555		Reddish yellow; cloudy.
12	920	1017	"	"				"
13	800	1016	"	Less Alb. ²	22.400	.200		copious deposit of lithææ.
14	1680	1019	"	Less	34.280	None		"
15	470	1020	"	Trace	Some lost	Some lost		Reddish yellow
16	1100	1018	"	"	35.200	None		"
17	1270	1017	"	"	31.750	.635		cloudy.
18	780	1020	"	"	24.180	.585		" lithææ.
19	580	1021	"	"	18.560	.580		" lithææ.
20	790	1022	"	None	25.280	1.188		Reddish yellow
21	930	1022	"	"	20.460	1.395	1st week of convalescence	Yellow; clear.
22	820	1023	"	"	19.680	2.975		Reddish yellow; lithææ.
23	670	1021	"	"	19.430	3.350		clear.
24	690	1022	"	"	19.320	4.140		Yellow
25	850	1022	"	"	21.675	5.950		Reddish yellow
26	840	1021	"	"	21.000	5.460		"
27	640	1024	"	"	16.640	2.200		"
28	1550	1016	"	"	26.350	8.525		Yellow
29	1780	1011	"	"	19.580	10.680		Bright yellow
30	2160	1011	"	"	21.600	12.960		"
31	2900	1010	"	"	23.200	14.500		"
32	1430	1013	"	"	17.160	7.150	3rd wk. of conval.	"

¹ The albumen was separated before testing for the urea and chlorides.² The albumen not separated, being so little.

Weight on the 27th day 47·3 kilogrammes or 104 lbs. ; on the 32nd day 48·1 kilogrammes or 106 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (2 days' urine)	980	23·300	·580
	or per kilogramme of body weight		·485	·012
2	During lysis	996	27·958	·378
	or per kilogramme of body weight		·581	·007
3	During 1st week of convalescence	895	25·015	1·4716
	or per kilogramme of body weight		·520	·0305
4	During 2nd week of convalescence	1003	20·570	5·758
	or per kilogramme of body weight		·427	·119
5	During 3rd week of convalescence	2163	20·653	11·536
	or per kilogramme of body weight		·430	·239

CASE 12.—George Y—, æt. 29, admitted March 7th—fifth day of attack. Patient states that he has been ill for four days, his attack commenced with headache, rigors, and general pains. On admission his mind was quite clear, his skin was hot and there was a copious rather dark rash on trunk and limbs, quite distinct on the dorsum of his feet; the tongue was moist and red at the tip and edges, thickly furred down the centre; the bowels had been opened just before admission; he was breathing quietly and the heart sounds, though weak, were quite normal.

The Rash.—Copious on admission grew dark and petechial as the disease advanced. It began to fade on the eleventh day but slight remains of petechiæ were still visible on the eighteenth day.

Sleep.—He slept badly and was restless, with a good deal of delirium, till the tenth day, afterwards well.

Complexion.—Muddy and flushed, with the suffused and injected eyes and dull look of typhus fever till the tenth day; he then gradually improved and his expression was pretty good on the thirteenth day.

Tongue.—Moist and furred at first, grew dry, smooth, and more or less furred, from the eighth to the eleventh days. On the fourteenth it was moist and clean, with slight remains of fissures visible.

Bowels.—Open throughout without medicine, were rather loose on the tenth day.

Thirst.—Was great till the eighth day, but not complained of after the tenth day.

Appetite.—Began to return on the twelfth and was very good by the fifteenth day.

Cough.—Never very troublesome. A few bronchitic râles were noted over back from the seventh to the sixteenth days.

Heart.—Sounds rather weak, else normal.

Patient was up for the first time on the nineteenth day of his attack. He left at his own request on the twenty-first day. His weight on leaving was 99 lbs, or 45 kilogrammes.

Treatment.

5th day.	℞	Mist. Camphoræ ʒj. 4tis horis.
6th	„	Sedative draught.
7th	„	Mustard to back.
10th	„	Rep. Mustard back and chest.
14th	„	Haust. Cinchonæ ʒj. ter die.

Diet.

5th day.	Low diet, beef-tea.
6th	„ Egg 1, and brandy 4 oz. daily.
10th	„ Increase brandy to 6 oz. daily.
14th	„ Full diet, with porter Oj; omit brandy. (See Diagram XII.)

CASE 12.—George Y—, æt. 16. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.		Chlorides.		Colour and deposit.
					Grammes.	Grammes.			
	C. C.				24.500	None			
7	700	1020	Acid	None	Lost	Lost		Before	Reddish yellow; copious deposit of lithates.
8	Lost	1016	"	Trace				Iysis	
9	800	1017	"	"	28.800	.200		Dur.	Yellow
10	970 ¹	1012	"	None	16.490	.485		Iysis	"
11	370 ¹	1017	"	"	.....	.....			"
12	900	1019	"	"	26.190	.900			"
13	1320	1013	"	"	25.080	2.640			cloudy.
14	1450	1011	"	"	21.750	2.900			clear.
15	1310	1012	"	"	22.925	3.980			"
16	1680	1010	"	"	22.680	6.720			"
17	1360	1011	"	"	13.600	6.020		1st week of	Reddish yellow; clear.
18	1810	1014	"	"	21.720	6.385		convalescence	"
19	1280 ¹	1016	"	"	.....	.....		2nd	"
20	1410	1010	"	"	16.920	3.525		wk. of	Bright yellow
21	1490	1012	"	"	19.370	2.235		conval.	"
									rather cloudy.

¹ Some urine lost on these days.

Weight on the 21st day 45 kilogrammes or 99 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (1 day's urine) or per kilogramme of body weight	·700	24·500 ·544	None
2	During lysis (1 day's urine)..... or per kilogramme of body weight	·800	28·800 ·640	·200 ·0044
3	During 1st week of convalescence or per kilogramme of body weight	·1404	21·992 ·489	4·206 ·0934
4	During 2nd week of convalescence or per kilogramme of body weight	·1450	18·145 ·403	2·830 ·063

CASE 13.—Edward S—, æt. 29, admitted into the London Fever Hospital, October 9th, 1865. Has been ill six days. He is a railway porter and is a strong healthy-looking man, he has always had good health, but lately has been out of work and not living very well. On admission, seventh day of his attack, his skin was hot with a typhus rash well out; his tongue was moist and furred and his bowels had been freely opened by medicine. He was complaining much of headache and general pains; sleeps badly and has wandered a little at night before admission.

Rash.—Well out on admission, was never very copious or dark. It began to fade on the thirteenth day and was gone on the fifteenth day.

Sleep.—Fair throughout attack; little wandering on eighth, ninth, and tenth, days.

Complexion.—Dusky and flushed, with suffused and injected eyes and heavy vacant expression till the eleventh day, was quite clear and natural on the fourteenth day. No sordes on lips throughout.

Tongue.—Moist and covered with a thick yellowish creamy fur till twelfth day, was less furred on thirteenth, and clean on the sixteenth day.

Bowels.—Inclined to be loose at first were open daily throughout attack.

Thirst.—Much complained of till the ninth day.

Appetite.—Patient complained of feeling hungry on the fourteenth day, but his appetite was not good till the eighteenth day.

Cough.—Rather troublesome occasionally.

Lungs.—Respiration over back rather harsh with some sibilant râles audible ninth, tenth, and eleventh days. No dulness on percussion.

Heart.—Sounds normal throughout; first sound rather weak, but impulse was felt distinctly throughout.

Perspiration.—Patient perspired freely on nights of thirteenth and fourteenth, and numerous sudamina were seen on chest and abdomen.

Patient was up for the first time on the sixteenth day for a few hours; he left the hospital quite well and strong on the thirty-fourth day.

Patients weight on the nineteenth day was 57 kilogrammes, or 125·5 lbs; on the thirty-fourth day was 70·7 kilogrammes, or 155·5 lbs.

Treatment.

7th day.	R	Æther mixture 3j, 4tis horis.
14th	„	Bark mixture 3j, ter die.

Diet.

7th day.	Low diet, with beef-tea.
14th	„ Full diet, and porter Oj.
18th	„ 1 egg. (See Diagram XIII.)

CASE 13.—Edward S—, æt. 29. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
9	1500	1015	Acid	None	36.750			
10	1875	1015	"	"	50.625			
11	1680	1015	"	"	46.200			
12	1540	1015	"	"	43.890			
13	1150	1015	"	"	33.350	.287		Pale yellow; uric acid deposit.
14	1050	1016	"	"	31.500	2.100		"
15	960	1019	"	"	27.860	2.700		"
16	905	1020	"	"	23.530	4.977		"
17	1480	1011	"	"	27.180	6.660		"
18	1330	1018	"	"	25.935	10.640		"
19	1830	1015	"	"	23.790	11.895		"
20	2200	1013	"	"	24.200	16.500		less uric acid deposit.
21	2135	1010	"	"	26.687	16.012		cloudy.
22	2185	1014	"	"	24.035	17.480		less uric acid deposit.
23	1090	1016	"	"	17.440	10.082		slight cloudy deposit.
24	1300	1018	"	"	24.700	14.950		Bright yellow
25	1510	1011	"	"	28.690	15.100		"
26	1920	1019	"	"	37.440	19.200		no deposit.
27	1825	1017	"	"	31.025	16.425		"
28	2530	1017	"	"	32.480	18.270		" slight cloudy deposit.
29	2380	1011	"	"	36.890	22.210		Pale yellow; no deposit.
30	2510	1010	"	"	47.690	25.210		"
31	1720	1020	"	"	36.980	18.920		" Bright yellow; slight cloudy deposit.
32	2200	1019	"	"	39.600	20.900		Pale yellow; no deposit.
33	1890	1017	"	"	35.910	15.985		"
34	2740	1017	"	"	44.580	23.290		" Bright yellow "

Weight on the 19th day 57 kilogrammes or 125·5 lbs. ; on the 34th day 70·7 kilogrammes or 155·5 lbs.

The average daily excretion of urinary water, urea, and chlorides for each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis. No urine obtained.			
2	During lysis or per kilogramme of body weight	·1648	44·366 ·627	
3	During 1st week of convalescence or per kilogramme of body weight	·1243	27·521 ·389	6·376 ·0901
4	During 2nd week of convalescence or per kilogramme of body weight	·1763	25·599 ·362	15·617 ·221
5	During 3rd week of convalescence or per kilogramme of body weight	·2162	34·144 ·539	20·026 ·283

CASE 14.—Henry D—, æt. 22, admitted into the London Fever Hospital October 18th, 1866, costermonger ; single. Present illness commenced eight days ago with headache, general pains, and rigors. His friends say that he has been very delirious. On admission his skin was hot with a distinct, but not copious, typhus rash. He did not complain of any pain ; was lying on his back with eyes closed and breathing quietly ; was rather stupid but answered questions when roused ; his tongue was moist at edges, dryish and rough down centre ; the bowels had been open before admission ; heart sounds weak but normal, and the lungs were clear at bases.

Rash.—Distinct but not very copious, was noted as fading on the eleventh day, and was entirely gone by the sixteenth day.

Sleep.—Disturbed with a good deal of wandering till the eleventh, then slept well.

Complexion.—Muddy and sallow with suffused and injected eyes, and dull vacant expression till the twelfth day, clear and natural on the sixteenth day.

Henry D —, Aged 22—Admitted Oct. 18th 1865. The 8th day of his Illness.

Diagram XIV.

Tongue.—Dry and rough down centre on admission, was brown and cracked slightly eleventh and twelfth days, then began to improve, and on the sixteenth day was moist and clean.

Bowels.—Rather loose at first, were open throughout acute stage without medicine; rather confined during convalescence.

Thirst.—Much complained of till eleventh day, not after.

Appetite.—Returning on the fifteenth day, good on seventeenth day.

Mind.—Confused and dull till twelfth day, then improved and was quite clear by sixteenth day.

Cough.—Rather troublesome from the ninth to sixteenth days.

Lungs.—Few sibilant râles audible over back till the seventeenth day.

Heart.—Sounds normal throughout, rather weak at first.

Patient was up for the first time on the twenty-fifth day. He left the hospital feeling well and strong on the thirty-third day.

His weight on the twenty-fifth day was 48·4 kilogrammes, or 106·5 lbs.; on the thirty-third day was 51·8 kilogrammes, or 114 lbs.

Treatment.

8th day.	R	Mist. Camphoræ ʒj, 4tis horis.
15th	„	Back mixture three times daily.
23rd	„	Castor oil ʒj, at once.

Diet.

8th day.	Low diet with beef-tea.
15th	„ Full diet, porter Oj.
17th	„ Not to have porter.
24th	„ 1 egg. (See Diagram XIV.)

CASE 14.—Henry D—, æt. 22. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
11	Lost.	1020	Acid	Trace	25.080	1.045	Before	Pale yellow; cloudy.
12	1045	1017	"	Less	23.790	.610	Iysis	deposit of lithates.
13	1220	1020	"	None				"
14	1900	1015	Alkaline	"	50.350	.950		cloudy; copious deposit of lithates.
15	2010	1011	Acid	"	42.220	2.010	Uris	no deposit.
16	1760	1016	"	"	48.500	1.760		Reddish yellow "
17	1080	1018	"	"	38.990	1.545		cloudy deposit.
18	1030	1027	"	"	36.565	4.120		Yellowish red; deposit of lithates.
19	1010	1026	"	"	33.638	5.555		Reddish yellow "
20	1040	1021	"	"	32.760	5.720		"
21	980	1024	"	"	30.690	3.720		Yellowish-red; cloudy deposit.
22	870	1021	"	"	25.230	2.175	1st week of	Reddish yellow; no deposit.
23	670	1017	"	"	21.105	2.345	convalescence	slight deposit of lithates.
24	665	1028	"	"	24.937	4.332		cloudy deposit; few phosphates.
25	500	1025	"	"	18.500	2.250		deposit of lithates.
26	1240	1023	"	"	39.060	9.300	2nd week of	Yellow; cloudy deposit.
27	910	1020	"	"	26.845	5.915	convalescence	Reddish yellow; cloudy deposit.
28	1425	1019	"	"	29.925	12.825		Bright yellow; slight cloudy deposit.
29	1560	1016	"	"	24.960	13.260		"
30	980	1020	"	"	17.640	9.555		Pale yellow "
31	800	1020	"	"	15.200	9.600		Bright yellow "
32	1270	1023	"	"	25.400	15.875	3rd week of	Yellow "
33	960	1023	"	"	21.600	12.480	conval.	"

Weight on the 25th day 48·4 kilogrammes or 106·5 lbs.; on the 33rd day 51·8 kilogrammes or 114 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (2 days' urine)	1132	24·435	·8275
	or per kilogramme of body weight		·473	·0159
2	During lysis	1890	47·023	1·573
	or per kilogramme of body weight		·907	·0303
3	During 1st week of convalescence	940	30·567	3·594
	or per kilogramme of body weight		·590	·0695
4	During 2nd week of convalescence	1040	25·923	8·405
	or per kilogramme of body weight		·500	·162
5	During 3rd week of convalescence	1010	20·733	12·651
	or per kilogramme of body weight		·400	·244

CASE 15.—Joseph A—, æt. 20, shoemaker, admitted into the London Fever Hospital, November 10th. Attack commenced yesterday (November 9th) whilst at work, with headache, pains in back and limbs, and rigors. Patient felt quite well the day before yesterday. Has always had good health. Body is well nourished.

On admission was suffering much from headache and general pains; his face was flushed; the skin hot, but there was not any distinct rash. The tongue was moist and furred; the bowels had been opened the day before. He was very thirsty, and rather restless. Lungs and heart were quite healthy. Mind quite clear.

Rash.—On the third day the skin of trunk was injected and a few rose spots, slightly elevated, were to be seen here and there; on the fourth day there was a distinct typhus rash on the forearms, and backs of hands, and on the fifth day it was quite distinct on the trunk; never very petechial, but noted as dark and copious during the course of the disease. It began to fade on the twelfth, and was quite gone by the fifteenth day.

Sleep.—His sleep was restless and disturbed, with much delirium from the fifth to the tenth day, then gradually improved. On the fourteenth slept well, and continued to do so.

Complexion.—Dusky and flushed, with suffused and injected eyes, dry lips, but no sordes throughout, and a heavy listless vacant expression till the fifteenth day. Noted as clear, but rather pallid, with good expression, on the nineteenth day.

Tongue.—On the eleventh and twelfth days it was noted as dry and brown down the centre, and again slightly so on the fourteenth and fifteenth days, at other times it was moist and furred. Not noted as quite clean till the twenty-first day.

Bowels.—Were open throughout, without medicine; rather loose from the sixth to the ninth days.

Headache and general pains, with nasty taste in mouth, were complained of more or less till the eighth day. Headache very bad indeed the first four days.

Appetite.—First complained of hunger on the fourteenth, but the appetite was not good till the twentieth day.

Cough.—Slight, with some little frothy expectoration, from the sixth to the fourteenth days.

Heart sounds on admission were weak, but otherwise normal. From the twelfth to the nineteenth days, a soft blowing systolic murmur was audible at the mitral apex. On the twenty-fifth day it had quite gone and was not heard afterwards.

Patient did not get up till the twenty-sixth day, having to wait for his clothes, then felt very well and strong. He left the Hospital on the thirtieth day of his illness, at his own request, said he felt strong enough to work.

Weight on twenty-sixth day 51·1 kilogrammes, or 112·5 lbs.; on thirtieth day 52·3 kilogrammes, or 115½ lbs.

Treatment.

2nd day. ℞ Dilute Hydrochloric acid ℥xv, dilute Nitric acid ℥xv, Spirit of Nitrous ether ʒss, Syrup ʒss, water to ʒj. Mixture to be taken every four hours.

10th day.	Linseed and mustard poultice to loins.
19th „	Sulphate of Quinine gr. ij, dilute Sulphuric Acid mix, water ℥j. To be taken three times daily.

Diet.

2nd day.	Low beef tea diet.
19th „	Wine 4 oz., egg one.
20th „	Full diet and porter Oj. To leave off wine. (See Diagram XV.)

CASE 15.—Joseph A—, æt. 20. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.	Before lysis	
5	1310	1026	Acid	None	55.200	3.595		Yellowish red; slight cloudy deposit.
6	820	1030	"	"	36.670	2.870		lithates.
7	880	1028	"	Slight amount	.....	.....		no deposit.
8	880	1025	"	"	.....	.....		"
9	1500	1018	"	More	45.000	Trace		" alb. separated before ex- aming for urea.
10	1180	1022	"	"	44.635	.565		"
11	830	1022	"	"	32.370	Trace		"
12	1660	1021	"	$\frac{1}{2}$ part	65.570	"		Reddish yellow
13	1390	1016	"	"	48.650	"		lithates
14	1050	1020	"	"	42.000	"		" copious
15	1250	1021	"	"	51.250	.625		cloudy.
16	1830	1017	Alkaline	None	61.305	1.830		Yellow; copious deposit of lithates.
17	1490	1015	"	"	32.780	3.725		"
18	1460	1017	"	"	30.660	5.840		Bright yellow; muddy.
19	1630	1016	Acid	"	30.970	7.335		Reddish yellow; slight cloudy deposit.
20	1250	1020	"	"	32.520	2.500		"
21	1440	1016	"	"	34.560	2.160		"
22	1370	1015	"	"	26.715	2.055		lithates.
23	1310	1013	"	"	23.580	3.275		"
24	1600	1010	"	"	24.000	4.800		cloudy deposit.
25	1520	1014	"	"	25.080	4.860		"
26	1530	1013	"	"	23.100	5.390		Yellow; slight
27	1790	1011	"	"	21.480	4.475		Reddish yellow; cloudy; no deposit.
28	1550	1012	"	"	24.800	5.425		" phosphates.
29	970	1015	"	"	17.460	5.225		deposit of lithates.
30	2100	1011	"	"	21.000	11.550		Yellow; cloudy; phosphates.

Weight on the 26th day 51·1 kilogrammes or 112·5 lbs.; on the 30th day 52·3 kilogrammes or 115·5 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water,	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (5 days' urine)	1060	42·575	1·406
	or per kilogramme of body weight .....	.....	·814	·0268
2	During the lysis.....	1445	50·259	1·030
	or per kilogramme of body weight .....	.....	·961	·0197
3	During 1st 5 days' of convalescence, the temperature being high	1430	31·085	3·978
	or per kilogramme of body weight .....	.....	·961	·0760
4	During 8 succeeding days, the temperature being still high	1622	22·562	5·563
	or per kilogramme of body weight .....	.....	·421	·106

CASE 16.—James H—, æt. 16, admitted into the London Fever Hospital, October 12th 1865, was born and has lived in London all his life. Is a paper-hanger by trade. He has always lived pretty well, and has had very good health.

His present attack commenced six days before his admission, with headache, rigor and general pains. When first seen (October 12th) his headache had entirely left him, he complained of much thirst; his skin was very hot and covered with fleabites, and there was a faint typhus rash visible.

Rash.—Distinct on admission, grew darker as the disease advanced. It was never very copious. It began to fade on the thirteenth day, and was quite gone by the sixteenth day.

Sleep.—He slept pretty well throughout, restless but not wandering except on the ninth.

Complexion.—Dusky and flushed, with suffused and injected eyes and slight sordes on lips and teeth till the eleventh day, then gradually improved, and on the sixteenth day it was noted *clear*. His expression, at first vacant and dull, was good on the sixteenth day.

Tongue.—With the exception of the eleventh day, when it

was dryish at tip and down centre, the tongue was moist and furred throughout. It was quite clear on the fifteenth day.

Bowels.—Were open throughout without medicine, were rather loose on the eighth. Natural stool on the sixteenth day.

Thirst.—Much complained of till tenth day, but not afterwards.

Appetite.—Returning on the twelfth day. Good on the sixteenth day.

Mind.—Confused and dull to the thirteenth day, then improved; and on the sixteenth day was quite clear.

Lungs.—Cough nothing to speak of throughout, no dulness chest or back. Respiration noted as rather harsh at bases from the ninth to the fourteenth days.

Heart.—Sounds and dulness normal throughout.

Patient was up for about two hours on the sixteenth day. He left the hospital on the twenty-third day, feeling quite well and strong.

Weight on the sixteenth day 38·2 kilogrammes, or 84 lbs.

„ twenty-third „ 41·8 „ or 92 lbs.

Treatment.

7th day.	R	Nitric acid mixture every four hours.
8th „		Chalk of catechu mixture occasionally.
10th „		Bark mixture three times daily.

Diet.

7th day.	R	Low, beef-tea diet.
14th „		Full diet. (See Diagram XVI.)

CASE 16.—Joseph H—, æt. 16. *Analysis of Urine.*

Day of disease.	Quantity of water.		Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.			Colour and deposit.
	C.	G.						Grammes.	Before lysis.	
9	1500		1010	Acid	None	22.500	.....			
10	2010		1008	"	"	32.160	1.005			
11	1940		1009	"	"	30.070	.495			
12	Lost		1010	"	"					
13	1550		1010	"	"	29.450	.775			
14	1070		1009	"	"	17.120	.535			
15	720		1010	"	"	15.840	.540			
16	955		1006	"	"	12.415	.477			
17	1330		1012	"	"	22.610	.987			
18	1250		1011	"	"	21.250	1.250			
19	1240		1010	Slightly Alkaline	"	19.840	3.720			Pale yellow; slight deposit of lithates.
20	1050		1010	"	"	20.475	3.675			" " copious
21	1140		1017	"	"	24.510	6.270			Yellow
22	1390		1013	"	"	24.230	9.730			" "
23	880		1017	"	"	19.860	4.840			" "
24	1380		1017	Acid	"	20.010	12.420			Bright yellow; no deposit.

Weight on the 16th day 38·2 kilogrammes or 84 lbs.; on the 23rd day 41·8 kilogrammes or 92 lbs.

The average daily excretion of urinary water, urea, and chlorides has been during each period—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (1 day's urine)	1500	22·500	.....
	or per kilogramme of body weight .....	.....	·538	.....
2	During lysis	1642	27·200	·7025
	or per kilogramme of body weight .....	.....	·651	·0168
3	During 1st week of convalescence	1240	19·563	2·417
	or per kilogramme of body weight .....	.....	·468	·0578
4	During 2nd week of convalescence	1216	21·200	8·996
	or per kilogramme of body weight .....	.....	·505	·215

CASE 17.—Henry C—, æt. 15, labourer, admitted into the London Fever Hospital, March 1st, 1866.

Patient states that he has been ill four days. His attack commenced with headache and general pains. On admission his mind was quite clear, he answered questions readily—his skin was hot, and there was a distinct though not copious typhus rash to be seen. The tongue was moist and thinly furred down centre, red at tip and edges. The bowels had been opened the day before—he had no cough, but he complained much of headache and general pains.

The rash.—Distinct on admission, was not very copious throughout the attack; it gradually grew darker and began to fade on the twelfth day, and was entirely gone by the sixteenth day.

Sleep.—He slept pretty well throughout; he wandered a little on the nights of the tenth and eleventh days, and on the afternoon of the fifteenth day.

Complexion.—Dusky and flushed with suffused and injected eye, dry lips up to the eleventh day, then gradually improved, and was noted as clear with good expression on the eighteenth day.

Henry C—, Aged 15.—Admitted March 1st 1866. The 6th day of his illness.

Tongue.—Furred throughout, was rather dry at the tip till the eighth day. Clean and moist on seventeenth day.

Bowels.—Were open throughout without medicine.

Headache and general pains.—Rather severe at first, disappeared after the ninth day.

Thirst.—Much complained of till the tenth day.

Appetite.—Returning on the thirteenth, good on the sixteenth day.

Mind.—No great wandering throughout, but mind was very confused from the ninth till the eleventh day.

Cough.—Not complained of; lungs were clear throughout.

Heart.—Sounds weak—during the second week of attack, else normal.

Slight desquamation of the skin was noted from the nineteenth to the twenty-first days.

Patient got up for the first time on the twenty-second day. On the twenty-fifth day he weighed 75·5 lbs. or 34·3 kilogrammes.

On the thirty-sixth day he weighed 84·5 lbs. or 38·4 kilogrammes.

Treatment.

5th day of attack.	℞	Mist. Camphoræ, ʒj, 4tis horis.
14th " "		Haust. Cinchonæ, ʒj, t. d. s.

Diet.

5th day.	Low, beef-tea diet.
14th "	Middle diet and fish.
17th "	Middle diet and chops. (See Diagram XVII.)

CASE 17.—Henry C—, æt. 15. *Analysis of Urine.*

Day of disease.	Quantity of water.	Specific gravity.	Reaction.	Albumen.	Urea.	Chlorides.		Colour and deposit.
	C. C.				Grammes.	Grammes.		
7	1430	1013	Acid	None	22.880	1.430	Before lysis.	Yellow; slight cloudy deposit.
8	1140	1017	"	"	17.670	.885		" clear.
9	960	1017	"	"	15.360	.480		" "
10	500 ¹	1019	"	"	15.900	.530		Yellow; copious deposit of lithates.
11	1060	1017	"	"	15.180	None		" cloudy.
12	660	1023	"	"	14.000	"		" lithates.
13	400	1023	"	"	26.040	.465		Reddish yellow; cloudy; lithates.
14	930	1017	"	Trace	27.600	.690		Yellow; clear.
15	1380	1013	"	"	29.520	.615		Reddish yellow; clear.
16	1230	1016	"	"	13.340 ¹	.580 ¹		Yellow; clear.
17	580 ¹	1018	"	None	18.690	.885		" "
18	590	1023	"	"	17.280	2.520		" "
19	640	1021	"	"	17.825	9.875		" "
20	775	1018	"	"	17.820	4.950		Reddish yellow; clear.
21	660	1022	"	"	13.160	4.480		" "
22	560	1020	"	"	13.800	4.500		" phosphates.
23	600	1022	"	"	15.120	5.040		" "
24	630	1022	"	"	19.140	7.830		Reddish yellow; cloudy; lithates.
25	870	1023	"	"	17.480	10.160		Yellow; slight deposit.
26	1270	1016	"	"	16.200	6.480		" clear.
27	1080	1017	"	"	23.290	12.330		Bright yellow; clear.
28	1370	1013	"	"	21.110	14.770		" "
29	2110	1012	"	"	20.040	9.185		" "
30	1670	1013	"	"	22.605	10.960		Yellow
31	1370	1017	"	"	27.600	13.800	3rd week of convales.	Bright yellow
32	2300	1011	"	"	21.945	5.320		" "
33	1330	1015	"	"	34.500	18.400		Yellow
34	2300	1015	"	"				Bright yellow

¹ Some lost on each of these days.

Weight on the 25th day 34·3 kilogrammes or 75·5 lbs.; on the 36th day 38·4 kilogrammes or 84·5 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (6 days' urine)	941	16·831	·552
	or per kilogramme of body weight .....	.....	·438	·0143
2	During lysis	1180	27·720	·590
	or per kilogramme of body weight .....	.....	·722	·0153
3	During 1st week of convalescence	637	16·429	3·535
	or per kilogramme of body weight .....	.....	·228	·0920
4	During 2nd week of convalescence	1285	18·911	9·399
	or per kilogramme of body weight .....	.....	·492	·242
5	During 3rd week of convalescence	1825	26·662	12·120
	or per kilogramme of body weight .....	.....	·794	·318

CASE 18.—Edmund J—, æt. 11 years, admitted into the London Fever Hospital, January 1st, 1866. Father labourer.

Says that he first felt ill yesterday (December 30th), the day before was running about and quite well. His attack commenced with rigors, headache, and pains all over.

On admission his skin was hot, somewhat injected, but there was no distinct rash, numerous fleabites. His tongue was moist and red at tip and edges with thin white fur on dorsum. He complained of much thirst and headache; he had slight cough, and there were a few sonorous and sibilant râles audible over the back, but no dulness. The heart-sounds were quite healthy and his mind quite clear.

Rash.—There was no distinct typhus rash throughout, but on the third, fourth, and fifth days pinkish mottling was noted on the arms and trunk.

Sleep.—He slept well throughout; profuse perspiration was noted on the fifth and slight on the seventh and eighth. No delirium at all.

Complexion.—Slightly flushed from the third to the fifth

day. Expression noted as rather listless on the fourth, fifth, and sixth days; good on the seventh.

Tongue.—Noted as moist throughout; thinly furred up to the eighth day.

Bowels.—Open throughout without medicine.

Headache with general pains. Rather severe to the fourth day; nasty taste in his mouth complained of till the seventh day; never at all deaf.

Appetite.—First complained of being hungry on the sixth day; appetite was noted as good on eleventh day.

Cough.—Slight throughout; no expectoration.

Lungs.—Few sonorous râles were audible over chest the first seven days.

Heart.—Sounds normal throughout, with the exception of slight reduplication of the second sound, first noted on the fourth day.

Patient got up for the first time on the fourteenth day, and was discharged well and strong on the twenty-second day.

Patient weighed on the fourteenth day 55·5 lbs., or nearly 25·23 kilogrammes.

Treatment.

2nd day.	R	Mist. Camphoræ ʒj, every four hours.
9th	„	Bark mixture ʒss, three times daily. Mustard to back.

Diet.

2nd day.	Low, beef-tea.	
9th	Fish, and middle diet.	(See Diagram XVIII.)

Irregular

" " " " " " " " " " " "

Diagram XVIII

CASE 18.—Edmund J—, æt. 11. *Analysis of Urine.*

Day of disease.	Quantity of water.		Specific gravity.	Reaction.	Albumen.	Urea.		Chlorides.			Colour and deposit.
	C. C.	oz.				Grammes.	Grains.	Grammes.	Grains.		
4	1080	38	1017	Acid	None	32.940	507.2	1.620	24.9	Before	Yellowish red; clear.
5	1240	43½	1012	"	"	26.040	401	1.240	19.0	Before	" "
6	820	28½	1015	"	"	20.500	315.7	.820	12.5	Before	Yellow "
7	Lost	Lost	1017	"	"	.....	.....	.....	.....	Before	" "
8	650	22½	1015	"	"	13.650	209.2	.650	10.0	Before	Reddish yellow "
9	450	15½	1017	"	"	10.350	159.3	.900	13.8	1st week of	Yellowish red "
10	640	22½	1019	"	"	12.800	197.1	4.160	64	1st week of	Yellow; cloudy deposit; phosphates.
11	620	21½	1015	"	"	11.780	181.4	5.890	90.7	1st week of	" clear.
12	850	30	1020	"	"	18.700	287.9	6.375	98.1	1st week of	Yellowish red; clear.
13	770	27½	1017	"	"	18.480	284.5	6.160	94.8	1st week of	Yellow; slight cloudy deposit.
14	640	22½	1022	"	"	20.560	316.6	5.120	78.8	1st week of	" clear.
15	730	25½	1023	"	"	18.615	286.6	5.840	89.9	1st week of	" "
16	880	31	1021	"	"	22.880	352.3	4.840	74.5	2nd week of	" "
17	620	21½	1027	"	"	19.220	295.9	5.890	90	2nd week of	" "
18	550	19½	1027	"	"	17.050	262.5	5.225	80	2nd week of	Pale yellow; lithates.
19	620	21½	1025	"	"	15.500	238.7	4.030	62	2nd week of	" "

Weight on the 14th day 25·2 kilogrammes or 55·5 lbs.

The average daily excretion of urinary water, urea, and chlorides during each period has been—

		Amount of water.	Urea.	Chlorides.
		C. C.	Grammes.	Grammes.
1	Before lysis (2 days' urine)	·1160	29·490	1·438
	or per kilogramme of body weight .....	.....	1·170	·0569
2	During lysis	·735	17·075	·735
	or per kilogramme of body weight .....	.....	·677	·029
3	During 1st week of convalescence	·671	15·898	4·920
	or per kilogramme of body weight .....	.....	·651	·193
4	During 2nd week of convalescence	·667	18·662	4·996
	or per kilogramme of body weight .....	.....	·740	·196