On the temperature of the body as a means of diagnosis in phthisis and tuberculosis / by Sydney Ringer.

ON THE

TEMPERATURE OF THE BODY

AS A MEANS OF DIAGNOSIS

IN PHTHISIS AND TUBERCULOSIS.

BY

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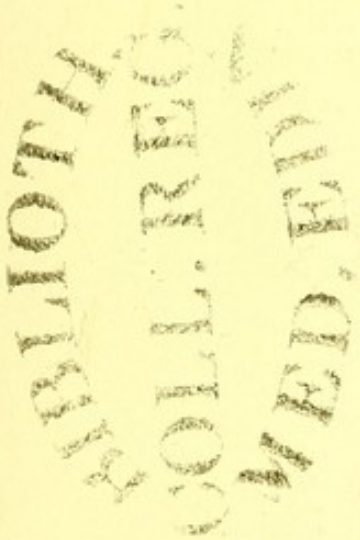

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ALTHOUGH in these pages the author has limited himself to twenty-four cases of phthisis, the propositions therein stated are based on a far more extensive series of observations made both by others and himself. In addition to the cases that have come under his immediate observation, the temperature of twenty-five patients suffering from phthisis has been taken by Mr. Appleby, in all of whom it was found to be abnormally high.

Thus in 2 cases it was $99\frac{4}{5}°$.

In 4 cases it varied between 100° and 101°.

In 7 „ „ 101° and 102°.

In 7 „ „ 102° and 103°.

In 4 „ „ 103° and 104°.

In 1 „ „ 104° and 105°.

An interesting case has been lately observed by Mr. Arnott, one of the Resident Medical Officers to

the Brompton Hospital for Consumption. The patient had been ill some time before her admission into Hospital, and during the subsequent three months her temperature has risen on each day to a point rather higher than that normal to the body, namely from $99\frac{4}{5}°$ to 101°. Nevertheless, no physical signs could be detected sufficient to justify the diagnosis of phthisis till within the last fortnight of this period. It will be seen by those who read this pamphlet that all these cases fully bear out the propositions shortly to be stated.

In conclusion, the author takes this opportunity of especially thanking Mr. J. Bartlett for the great assistance he has rendered him whilst making his observations for this paper.

SYDNEY RINGER.

15, Cavendish Place,
Cavendish Square,
January 20, 1865.

The reader is requested to insert the following Foot-note on p. 26.

By the expression "continued elevation of the temperature" is meant an elevation continuing for a period varying between five weeks, to six, eight, or even more months.

ON THE

TEMPERATURE OF THE BODY,

AS A MEANS OF DIAGNOSIS IN

PHTHISIS AND TUBERCULOSIS.

MUCH attention has of late years been paid to the temperature of the body in various diseases, and much practical information has been derived from this study.

In this paper the results of rather numerous observations on the temperature in tuberculosis and phthisis are given. Should these conclusions be confirmed by subsequent observations, the author hopes they will be found to be of some practical value.

As the thermometer has hitherto been but little used in medicine, a few remarks respecting its application will perhaps not be considered out of place in this pamphlet.

It is now generally admitted that the temperature of the body should be taken by a thermometer placed in the axilla.

The patient should be in bed and undressed, other-

wise the temperature of the surface of the body may be considerably below that of the internal parts. A difference of 2° or even 3° Fah. can easily result from the non-observance of this precaution.

The patient should be in bed an hour before the temperature is taken, as this time is often required before the surface of the body recovers from the effects of the previous exposure.

The patient should be placed diagonally on the right or left side. For if placed on their back, patients are apt, in their anxiety to retain the thermometer in the axilla, to press the arm too firmly against the side, and thus to make the anterior and posterior boundaries of the axilla tense. The axilla is thus converted into a cavity, in which the bulb of the thermometer moves about loosely, without coming thoroughly in contact with the tissue. This is especially apt to occur in emaciated people.

On the other hand, if placed quite on the right or left side, the distal end of the thermometer becomes depressed, thus rendering the reading of it difficult; nay, sometimes the column of mercury divides, when part gravitates down the tube, giving a fictitious result.

If, on the other hand, the patient be placed neither completely on the back or side, but in a medium position, these objections are obviated, for the parts then fall naturally together, no muscular effort being required to retain the thermometer.

Care should be taken that the patient has been

previously covered up, and that the axilla has not been exposed, otherwise a difference of 2° or 3° Fah. may result.

It is, therefore, better, if the patient has been lying on one side, to turn him diagonally on the other, and to use the axilla which was previously most dependent.

Care should be taken that the thermometer be in complete contact with the skin, and that no clothes are in the way to separate it from the surface of the body.

All these precautions being observed, it is better to allow the thermometer to remain in the axilla at least five minutes.

Thermometers should always be tested, as even those sold by the most trustworthy makers sometimes vary as much as 1° Fah.

The temperature should be taken twice in the day, at 8 A.M. and 8 P.M. If only one observation can be made in the day, the evening must be chosen, for often the temperature is normal in the morning, but very considerably elevated at night.

The observations recorded in this paper were obtained from patients under the care of Dr. Jenner, Dr. Hare, and Dr. Reynolds. They were made in order to ascertain what information the temperature of the body is capable of affording in cases of phthisis and tuberculosis.

The following are the conclusions arrived at:—*

* The author begs to acknowledge the great assistance he has

1. There is probably a continued elevation of the body in all cases in which a deposition of tubercle is taking place in any of its organs.

2. This elevation of the temperature is probably due either to the general condition of the body (tuberculosis), or to the deposition of tubercle in its various organs (tuberculization).

3. This elevation is probably due to the general condition (tuberculosis), rather than to the deposition of the tubercle (tuberculization).

4. The temperature may be taken as a measure of the amount of the tuberculosis and tuberculization, and any fluctuations in the temperature indicate corresponding fluctuations in the severity of the disease.

5. The temperature is a more accurate indication of the amount of tuberculosis and tuberculization, than either the physical signs or the symptoms.

6. By means of the temperature we can diagnose tuberculosis and tuberculization long before the physical signs and symptoms are sufficient to justify such a diagnosis.

7. By means of the temperature we can diagnose tuberculosis even when during the whole course of the disease there are no physical signs indicative of

received in collecting these cases from Mr. J. Bartlett; to whom he is indebted for the notes on the cases of Piper, Saunders, Foley, Farr, Thompson, Regan, Bryson, Rush, and Dale. To Mr. Arnott he is indebted for the notes on Cartwright, Jones, and Sullivan. His thanks are also due to Mr. Appleby, who has rendered him much assistance in taking the temperature in most of the remaining cases.

tubercular deposit in any of the organs of the body, and in which cases the symptoms (apart from the temperature) are inadequate to enable us to arrive at such a diagnosis.

8. It is probable that by means of the temperature we can conclude that the deposition of the tubercle has ceased, and that any physical signs that are present are due to obsolescent tubercle and the chronic thickening of the lung tissue between the tubercular deposit.

9. It is probable, though further observations on this point are necessary, that the temperature of the body affords a means by which we can diagnose between diseases in which the symptoms and physical signs are either too scanty or too much alike to enable us to decide between them.

These propositions will be now considered *seriatim:*—

1. There is probably a continued elevation of the temperature of the body in all cases in which a deposition of tubercle is taking place in any of its organs.

Thus, of the twenty-four cases here given, in twenty-one there was a continued elevation of the temperature of the body, and in these twenty-one cases the deposition of tubercle was proved during life by an increase of the physical signs, or after death by the post-mortem appearances.

In one of the three remaining cases no increase of the physical signs was detected whilst the patient

was in the Hospital; but her stay there was short; and on her return, after an absence of some weeks, the physical signs were found to have increased. The temperature in this case (Rogers) was but slightly elevated. In the two remaining cases, not only was there no * elevation of the temperature, but no increase could be detected in the physical signs, and on making the post-mortem examination the tubercle was found to have undergone retrograde changes, and to have become obsolescent. No recent tubercle was found. Thus, in the case of Cove, the cavities which were in both lungs were surrounded by thick, tough, and fibrous walls, and the grey granulations were shrunken (causing slight puckering of the surrounding lung tissue), extremely hard, and, for the most part, enclosed in their centre a small amount of cretacious matter; they, moreover, contained, and were immediately surrounded by, much black pigmentary matter. The lung tissue between them was also tough and fibrous.

In the case of Frampton, the tubercle had undergone similar changes, and presented similar appearances.

Thus, in all the cases observed in which the deposition of tubercle in the body was going on, there was a continued elevation of the temperature, whilst

* It is perhaps right to state that, in one of these cases the temperature once rose to 100°, and in the other case, on one occasion, once to 100 and once to 100⅘°. We are now speaking, however, of a continuous elevation of the temperature.

in those two cases in which the deposition of the tubercle had ceased, the temperature was normal.

2. This elevation of the temperature is probably due either to the general condition of the body (tuberculosis), or to the deposition of tubercle in its various organs (tuberculization).

Thus seven * of these cases during the chief part of their course had no detectable disease except the tubercle in the different organs of the body, and, therefore, in the present state of medical knowledge, we must admit that either tuberculosis or tuberculization is capable of causing an elevation of the temperature of the body.

Of the remaining cases, in which there was a continued elevation of the temperature, other diseased conditions besides the tuberculosis and tuberculization were present. As these secondary complications, though always slight in degree, may be thought to have been sufficient to account for the elevation of the temperature, they will now be considered.

These secondary complications were bronchitis,† slight ulceration of the intestines,‡ pneumonia,§ chronic inflammation of the pharynx and trachea,‖ aphthæ,¶ a trace of albumen in the urine,** and

* Reynolds, Duffield, Hearne, Woodbridge, Dickson, Rogers, and the early part of Bryson's cases.

† Piper, Saunders, Farr, Thompson, Wells, Dale, Rush, Regan, Cartwright, Jones, and Sullivan.

‡ Raden, Piper, Farr, Cartwright, Woodbridge, and Norton.

§ Piper, Foley, and Cartwright.

‖ Saunders, Foley, Farr, and Cartwright.

¶ Farr.

** Piper, Farr, Thompson, and Regan.

in one case some pleural friction * was detected; but there were no signs at any time of effusion into the pleura. In no single case were all these diseased conditions met with; they were variously and, for the most part, sparingly mixed in the different patients. In the majority of the cases, the only secondary complication was bronchitis.

1st. *Bronchitis.*—Probably part of the rhonchus heard was due to softening of the tubercle; still, in all the cases mentioned, a certain amount of bronchitis certainly existed.

To ascertain how far bronchitis is capable of elevating the temperature of the body, observations were made on five patients suffering from more or less severe capillary bronchitis; and on one patient, whose expectoration amounted to three-quarters of a pint daily, but in whose chest only sonorous and sibilant rhonchus could be detected: in none of these cases was there any elevation of the temperature of the body.

It may be objected that in these cases of bronchitis there was evidence of obstruction to the circulation, and want of proper aëration of the blood. This is true to some extent of five of the cases; but in the sixth there was no dyspnœa, nor any lividity of the face.

The author, therefore, thinks that it is improbable that the bronchitis could have caused the elevation of the temperature in these cases, especially so when

* Regan.

it is borne in mind, that in many of the cases the bronchitis was very small in amount; and when it is further remembered that if different cases of phthisis, or different periods of the same case are compared, the elevation of the temperature is in no way proportionate to the amount of bronchitis that is present.

Albumen.—Did the small amount of albumen in the urine of several of these patients indicate disease of the kidney, and, if so, was that disease sufficient to account for the elevation of the temperature? To ascertain how far chronic Bright's disease is capable of affecting the temperature, observations were made on several patients suffering from that affection. In none was there any elevation of the temperature of the body. And it must be borne in mind that fever (that is, elevation of the temperature due to any cause) is often productive of a small amount of albumen in the urine without there being any reason to suspect disease of the kidney.

In these cases of phthisis in which albumen was discovered in the urine, the temperature was considerably elevated, as high, indeed, as that attained in scarlet and typhoid fevers, namely, from 103° to 105° Fah.

Thus the author thinks he is justified in assuming that the albumen in the urine in these cases did not indicate sufficient disease of the kidney to cause elevation of the temperature.

Ulceration of the intestines.—In none of the cases was the ulceration extensive, and in no case

were they more than ten or twelve in number, indeed in one case they were much less numerous.

It will hardly be thought possible that so slight a lesion could cause so great an elevation of the temperature as was met with in these cases, that is, from 102° to 105° Fah.

That extensive ulceration of the intestines, both large and small, does not necessarily cause elevation of the temperature, is seen in the case of Frampton, in whom the ulceration was far more extensive than in any of the cases of phthisis given. Here there was no elevation of the temperature.

It must be further borne in mind that in some of these cases diarrhœa only set in a few days before death, at about which time it is probable that the ulceration commenced, and yet on the commencement of the diarrhœa the temperature suffered no increase in its elevation.

Pneumonia.—It is very improbable that the pneumonia was the cause of the elevation of the temperature throughout, for it had all the characters of being recent, was but slight in amount, and gave no evidence of its existence a few days previous to the death of the patients. Pneumonia, moreover, is frequently found in the lungs of persons who have died of various diseases, in which cases it is generally admitted to have set in only a very short time before death.

Chronic inflammation of the pharynx and trachea can scarcely be considered capable of elevating the temperature to 103° and 105° Fah.

Aphthæ.—It will scarcely be maintained that these could produce so high a temperature as 103° Fah.; moreover, they did not make their appearance till a few days before the death of the patient, at which time indeed there was a slight decline of the temperature.

Pleurisy.—The pleurisy indicated by the friction could not have elevated the temperature to 103° and 104° Fah. for five weeks without giving rise to effusion, yet there was no evidence at any time in this case of fluid in the pleural cavities.

Thus the author thinks he is justified in assuming that in these cases, accompanied with secondary complication, the elevation of the temperature, if not entirely, was mainly due to the tuberculosis or tuberculization.

It thus appears that not only are the conditions existing during the deposition of tubercle in the body capable of causing a continued elevation of the temperature, but that it actually does so, if not in all at least in the very great majority of cases, there being no exception to this rule amongst the cases given in this pamphlet.

That the elevation of the temperature in these cases was due to the phthisis, is shown by the correspondence which existed between the elevation of the temperature and the activity of the deposit in the lungs judged by the physical signs; for it can be seen by looking at any of these cases, that where the deposition was going on

rapidly, the elevation of the temperature was high, and *vice versâ*.

3. This elevation of the temperature is probably due to the general condition (tuberculosis), rather than to the deposition of the tubercle (tuberculization). For if the elevation of the temperature be due to the deposition of the tubercle, we must admit that the conditions existing during the deposition are far more capable of causing this elevation than are the conditions existing in closely allied diseases, as inflammations. Thus we meet with cases of phthisis in which the temperature is greatly elevated for several weeks before we get physical signs indicative of the deposition of tubercle in any part of the body, or of any considerable increase of the already existing deposition. For instance, Edward Reynolds began to be ill towards the latter part of March, but we were unable to detect sufficiently marked physical signs to warrant us in diagnosing phthisis till May 6th, and even on June 12th, the day of his discharge, the physical signs only showed consolidation of the right lung above the clavicle, and on the left side as low as the second rib in front, and four fingers' breadth below the spine of the scapula behind. Yet during the greater part of this time the temperature varied between 103° and 104° Fah., and during the whole time it rose daily considerably above the temperature normal to the body.

Thomas Hearne was first taken ill on July 15th, yet we were unable to detect sufficiently physical

signs to indicate consolidation of the lungs till August 13th ; and on September 6th, the physical signs indicated considerable consolidation on the right side of that portion of the lung occupying the supra clavicular and clavicular region, and slight consolidation of that portion immediately below the clavicle. There was no evidence of consolidation of the left lung, yet during by far the greater part of this time his temperature rose daily to 103° and to 104° Fah.

James Duffield was under observation from April 30th to August 18th. On the former of these dates the physical signs indicated in front slight consolidation of the right apex, and considerable consolidation over the whole of the left side ; behind, some consolidation on both sides, as low as the angle of the scapula. There were at this time no evidences of softening or excavation. At the post-mortem examination on August 19th, cavities were found in the upper lobes of both lungs, and the whole of these lobes contained much recent and obsolescent tubercle. The middle and the lower lobes contained only a very few scattered grey granulations, yet in this case the maximum temperature attained each day varied from 103° to 105° Fah.

It thus appears that in the cases here given a very small deposition of tubercle corresponds to a very considerable and long-continued elevation of the temperature ; and the remaining cases, if referred to, will be found to correspond to them in this respect. But inflammations of any of the tissues of the

body with a corresponding elevation of the temperature, give rise to signs and symptoms that indicate far greater alterations. Thus pneumonia sufficient to cause an elevation of the temperature equal to that met with in cases just given, would in a short time be sufficient to cause entire consolidation of both lungs. The author, therefore, thinks that in proportion to the right he has to argue from such analogy, is the probability that the elevation of the temperature is rather due to the general than to the local conditions existing in this disease.

The probable correctness of this inference is strengthened by the fact that in other diseases, such as the specific fevers, where the elevation of the temperature is in excess of the local derangement dependent on these diseases, we ascribe this elevation to some general cause rather than to the local disturbances. Thus in typhus, typhoid, scarlet fevers, &c., we do not ascribe the elevation to the rash, ulceration of the intestines, nor to the sore throat, but to some general condition which exists in these diseases. And the disproportion existing between the elevation of the temperature and the amount of tubercle deposited, is quite as great as that between the elevation of the temperature and the rash in typhus fever, the ulceration of the intestines in typhoid fever, and the rash and sore throat in scarlet fever.

4. The temperature may be taken as a measure of the amount of the tuberculosis and tuberculization,

and any fluctuations in the temperature indicate corresponding fluctuations in the severity of the disease.

For, 1st. If the elevation of the temperature be due to the phthisis, we should expect that there would be a close correspondence maintained between them.

2nd. In the case of inflammation of any of the tissues of the body, and also in the case of any of the specific fevers, the temperature is admitted to be an accurate indication of the severity of any of these diseases.

3rd. We actually find that the general symptoms, taken collectively, do most closely correspond to the temperature of the body ; that when they are severe the temperature is high, and *vice versâ*. All the cases corroborate this assertion, but especially so Reynolds, Hearne, Duffield, and Rogers.

4th. The elevation of the temperature closely corresponds to the activity of the deposition of the tubercle, for in those cases in which the physical signs, corroborated after death by examination of the organs, show the deposition to be actively going on, the temperature is high, and *vice versâ*. The assertion is especially proved by the case of Reynolds, Raden, Duffield, Rogers, and Dickson.

In some cases the temperature is considerably and permanently elevated throughout the day. In others, though normal or nearly so at one period of the day, at another period it rises to a considerable height, whilst in other cases this rise is far less considerable.

The first description of temperature is accompanied with very severe general symptoms and an active deposition of tubercle; the second description with less severe symptoms, and with a less active deposition; and the third description is accompanied with but few symptoms, and with a very slow deposition of tubercle in the body; and lastly, in those cases in which the temperature becomes and remains normal, all the symptoms disappear, and the deposition of tubercle ceases, as is seen in the case of Cove and Frampton.

5. The temperature is a more accurate indication of the amount of tuberculosis and tuberculization than either the physical signs or the symptoms. Thus it is only a considerable increase in the deposition of the tubercle in the body that can be detected by physical signs; nay, more, if the tubercle be scattered, even though it be abundant, it may give no evidence of its presence by physical examination; this was well seen in the case of Raden, in whom, after the most careful and repeated examinations, we could only get evidence of slight consolidation at one apex. However, at the post-mortem examination, the lungs were found to be abundantly studded with grey granulations. Further, in those cases of general deposition of tubercle, where death results from tubercular meningites, we constantly at the post mortem examination find tubercle abundantly scattered through the lungs, liver, peritoneum, &c., which tubercle gave no evidence of its presence

by physical signs during life. Thus it is apparent, that by the physical signs we can only get evidence of a continuation of the disease after a considerable interval has elapsed; whilst we have seen it to be highly probable that there is always an elevation of the temperature during the deposition of tubercle, and that the elevation is proportionate to the activity of the deposition, and thus the continuation and the amount of the disease can at any time be ascertained by the use of the thermometer. When it is thus borne in mind that only considerable deposits in the lungs can be detected by physical signs, and when to this it is added that the amount of tubercle deposited is small when compared to the general condition, whilst the alteration in the temperature is considerable, it will be evident that the temperature becomes a far better estimate of the general condition (tuberculosis) than the physical signs.

Of the symptoms in phthisis, though many are more or less constant, still it is well known that none can be implicitly relied on as evidence of the severity, or even of the continuance of the disease. For of all the symptoms, perhaps that most relied on as evidence of the continuation, or improvement of phthisis, is a loss or gain of weight of the patient. But the fact of the weight remaining the same will not justify us in concluding that the disease has either improved or been arrested. Thus, in four of these cases, continuance of the disease was proved by

an increase in the physical signs, and yet the weight of these patients remained the same. Thus Regan's weight, from June 6th to June 20th, fluctuated between 40 lb. and 39½ lb. Duffield's weight was taken on many occasions between March 31st and July 16th, and was found to fluctuate to the extent of 2 lb.; but it was exactly the same on both of the above dates. Bryson's weight continued the same from April 27th to May 17th. Emily Rogers weighed on April 8th, 49 lb., and on April 26th, 50 lb. Neither does a considerable increase of the weight of the patient necessarily show the arrest, or even any considerable improvement in the disease. For in the case of Reynolds the weight increased from 8 st. 1 lb. to 8 st. 8 lb., between May 25th and June 9th, and yet there was no considerable improvement in the disease, as judged by the temperature.

In the case of Hearne the weight increased from 98 lb. to 101 lb. between August 24th and August 31st, and yet the temperature indicated that the disease was still very severe, and that no improvement had then taken place.

Nor does a sudden and very great loss of weight necessarily indicate any increase in the intensity of the disease; thus Duffield lost 8 lb. in weight between July 16th and July 28th, and yet during this time the temperature indicated a less intensity of the disease than on many previous occasions.

A further objection to the weight when compared to the temperature as an indication of the severity

of the disease is, that it usually only gives evidence of any fluctuation when observations are made over extended periods, and also that food and the state of the bowels materially affect the weight, whilst none of these objections apply to the temperature.

It may be remarked here, that the weight* of the patient is chiefly regulated by the appetite; thus, if the appetite remains good, the patient may maintain, or even increase in weight, though the tuberculosis be sufficient to elevate the temperature as high as it usually reaches in scarlet or typhoid fever, that is to say, 103° and 105° Fah. On the other hand, immediately the appetite fails, the tuberculosis remaining the same, the patients most rapidly lose weight, and speedily die, as might, indeed, be expected, when it is borne in mind that the elevation of the temperature is due either to perversion of the forces of the body, or to increased consumption of the tissues, most probably, in part at least, to the latter.

The cases of Duffield, Reynolds, Hearne, Regan, and Rogers show the truth of the above statement. Thus, when it is borne in mind that the weight is regulated by the appetite, and that the appetite does not necessarily hold any relationship to the amount of the disease, it will be at once evident that the weight cannot be relied upon as a test of the severity of the tuberculosis.†

* When not interfered with by diarrhœa or profuse hæmoptysis, or other occasional causes.

† It is true that patients with a very considerable elevation of

Night sweats are generally considered to be in some measure indicative of phthisis; but, though often present, still their presence is not sufficient to establish the existence of, nor their absence, freedom from, that disease. Moreover, no evidence can be obtained from the amount of the sweating that will assist us in forming an opinion respecting the severity of the disease.

Their presence is not sufficient to indicate phthisis, for there are two chief causes of profuse sweating:—

1st. Fever (*i.e.*, elevation of the temperature) during the decline, of which sweating, more or less severe, generally occurs; and

2nd. General weakness.

When the sweating is due to the former of these conditions, namely, elevation of the temperature, it becomes of value in the diagnosis of phthisis; but in many cases it is impossible to decide whether the sweating results from fever or from debility.

In phthisis the temperature generally, except in the severer cases, falls daily to that normal to the

the temperature, but who enjoy a good appetite, do not lose flesh, provided, however, they are not employed in any active pursuit, which entails much waste of tissue. If, on the other hand, they are actively employed, then the food is insufficient to supply the waste caused by the fever and that due to muscular and mental exertion; hence phthisical patients who follow their employment are apt to lose in weight even when the appetite remains good. It thus follows that the appetite and the state of rest enjoyed by the patient become of the greatest importance in giving an opinion respecting the possible duration of the disease.

body, and we therefore may have a daily attack of sweating, and when the sweating indicates previous elevation of the temperature recurring daily for a considerable time, we are justified in assuming that it is significant of phthisis.

In some cases the distinction between the two kinds of sweating may be recognized. Thus, when due to fever, the sweating will occur only during its decline, and as we get only one daily rise of the temperature, we consequently have only one paroxysm of sweating in the twenty-four hours; whilst, if the sweating be due to debility, upon any exertion, or during sleep at any hour of the day, sweating will usually ensue, and therefore we may have several paroxysms of sweating in the course of the twenty-four hours.

But though this difference in the frequency of the attacks of sweating may in some degree serve to guide us in determining the cause of the sweating, yet too much reliance must not be placed on it, inasmuch as in advanced cases of phthisis both causes exist; and, consequently, though the frequency of the daily attacks surely show the presence of debility, they will not prove that the other cause, namely, fever, does not also exist.

But neither does the absence of sweating show freedom from phthisis, for in those cases in which the temperature remains permanently high, no sweating occurs; and, further, in some cases (Reynolds, Duffield, Hearne), though the daily rise in the

temperature is great, and the weakness marked, yet there may be no sweating.

Thus, from the frequent impossibility of determining the cause of the sweating, and from the fact that the two causes often coexist, it being in such cases impossible to determine how much of the sweating is due to the fever, and how much to the weakness of the patient, and also on account of the impossibility of determining, with anything approaching to accuracy, the amount of the secretion, it becomes apparent that sweating is but of little value either as evidence of the existence of phthisis or as a measure of the amount of the disease. But none of the objections now urged against sweating apply to the temperature, consequently this latter becomes of far more use than the former in ascertaining the existence and amount of tuberculosis.*

How far can the pulse be relied upon as capable of affording an indication of the presence and amount of tuberculization, and how far is it comparable with the temperature in this respect?

It is well known that the pulse and the temperature generally coincide,— alterations affecting the

* It is generally considered that sweating causes much exhaustion of the patient. When due to fever (elevation of the temperature) much weakness is often the result, not however from the sweating but from the increased consumption of tissue, which causes the elevation of the temperature. When, however, the sweating does not depend on a previous elevation of the temperature, it must be considered as the result, and not the cause of the exhaustion.

one also influencing the other. In all the cases now given, whether the physical signs were distinctive of tubercle or not, there was a decided elevation of the temperature; and as often as the increased frequency indicates increased elevation of the temperature, it becomes with it significant of phthisis. But cases occur in which, with a considerable elevation of the temperature, the pulse remains normal, or nearly so. Thus the author has seen two cases of typhoid fever; in one the temperature varied between 103° and 105°, and during this time the pulse never rose above 98, and generally it varied between 80 and 88. In the other case the pulse reached only 88 during the fever, but rose to 112 during convalescence.

It is thus evident that a normal frequency of the pulse is not sufficient to prove the absence of fever, and therefore the freedom from tuberculization. Such cases are, however, rare.

But whilst generally with an elevation of the temperature we have increased frequency of the pulse, it must be borne in mind that such increased frequency may be produced by other causes than an elevation of the temperature. Thus a most frequent cause of it is debility or exhaustion, for, in a case of convalescence from pneumonia, after the temperature became normal, the pulse still remained at 112 to 136. In another case, of bronchitis and dilated bronchi, the temperature was normal, but the pulse was, on an average, 124. In the case of Frampton, given in this paper, the temperature was normal, and

yet the pulse was, on an average, 114. In a case of pleurisy, after the temperature fell, the pulse remained at 108. In those cases of tuberculosis in which the temperature ultimately became normal, the pulse still continued high, in one case as high as 120. Moreover, the pulse may be very frequent in cases of simple hysteria; thus the author has met with a patient suffering from the disease uncomplicated with any other morbid condition, in which the pulse rose even to 160.

Hence we may frequently have an increased frequency of the pulse without any elevation of the temperature; but we have seen that it is probable that in all cases of tuberculization there is an elevation of the temperature; thus a continued increase in the pulse frequently cannot be taken to be significant of phthisis.

Is there any method of deciding between the increased frequency of the pulse due to fever and that due to weakness? The author knows of none but the use of the thermometer.

It may be said (with truth) that the cases in which we generally get increased frequency of the pulse from exhaustion, are those convalescent from some acute disease; but it is after such acute diseases that tuberculosis often sets in, and when, consequently, it is of great importance to decide between the causes.

And it certainly is true that in those cases in which the weakness is slowly brought about, the

pulse is much less apt to be increased, and thus such a constant increase in a person who has not previously suffered from an acute disease becomes important, as under such conditions the increase is very possibly due to fever, and is thus to some extent significant probably of phthisis; but much doubt must always exist till the temperature of the body is obtained. From these considerations it follows, therefore, that the pulse is of far less value in the diagnosis of tuberculosis than the temperature. It is also far inferior as a measure of the amount of tuberculosis; indeed in this respect it is almost useless, for it varies very greatly in frequency in different patients, and in the same patient when the temperature stands at the same point. And we have seen that after the tuberculosis has ceased, that is, after the temperature has become normal, the pulse may still continue very frequent.

To test the accuracy of these conclusions, the temperature and the pulse were observed by Mr. Appleby, in a very chronic case of phthisis. In this patient the maximum temperature attained each day varied between 100° and 100$\frac{3}{5}$° Fah., whilst the pulse varied usually between 76 and 80 beats in the minute, rising only on one or two occasions to 88. The observations were made during twenty days.

Of the remaining symptoms it is so generally admitted that they cannot be taken as indicative of the amount of the tuberculosis then existing, that

the author thinks he need urge no further proof in support of his statement.

Hence the author thinks he is justified in saying that it is probable that the temperature is a far more delicate measure of the severity of the disease in tuberculosis than are either the physical signs or the symptoms, whether the latter be taken individually or collectively.*

6. By means of the temperature we can diagnose tuberculosis and tuberculization long before we can detect any physical signs, and when the symptoms are insufficient to justify such a diagnosis.

The author trusts that it has been shown to be probable that there is a continued elevation of temperature in all cases of tuberculosis† and tuberculization; and he is further able to state, that after very numerous observations of the state of the temperature in various diseases, with one exception,‡ this continued elevation has been observed only in

* The collective symptoms certainly very often closely correspond to the amount of tuberculosis, and a fair estimate of the activity of the disease may be obtained from them. But they are so capable of being modified by diarrhœa, the amount of the appetite. hæmoptysis, &c., that they become less trustworthy than the temperature. Moreover the temperature can be accurately recorded day by day, and we thus can speak confidently as to the improvement or otherwise of the patient, whilst it is not so with the general symptoms.

† I mean by this term the active general condition, not that general condition which is known to *predispose* to the deposit of tubercle.

‡ In this case, even after a post-mortem examination, the nature of the disease could not be satisfactorily made out.

tuberculosis, rheumatism, and ague. The diagnosis of ague and rheumatism is rarely difficult, as both usually manifest marked and characteristic symptoms. Thus, if we meet with a case in which the temperature rises daily during a considerable time, if this be not rheumatism nor ague, it is probably tuberculosis. Of course further observations respecting the temperature in various diseases may modify this statement, but in the present state of knowledge the author thinks he has fair grounds for such a conclusion. How long must the elevation of the temperature continue before we can with probability suspect tuberculosis? The author thinks from ten to twenty days, each day adding considerably to the probability of the correctness of the diagnosis; for by the time mentioned, inflammation in any of the organs of the body would have declared itself by characteristic symptoms, or indeed by which time the majority of inflammations would have ceased. Moreover, before ten days has elapsed all the specific fevers would have rendered their diagnosis certain by their rash or other characteristic symptoms. The only disease likely to offer difficulty in this respect is typhoid fever. Still even in this disease, in the great majority of cases, symptoms would be present by the fifteenth or twentieth day, by which we should be able to recognise this disease.

We have, however, seen that physical signs sufficient to justify us in diagnosing tuberculosis even in acute cases may not present themselves till after the

period above mentioned has elapsed (Reynolds and Hearne); and the period before physical signs would show themselves would probably be very much longer in chronic forms of the disease.

The symptoms also apart from the elevation of the temperature are not sufficiently characteristic to enable us to diagnose tuberculosis.

Thus it is probable that we are able by means of the temperature to ascertain the existence of tuberculosis before we can detect any physical signs, and when the symptoms are inadequate to justify such a diagnosis.*

7. By means of the temperature we can diagnose tuberculosis, even when during the whole course of the disease there are no physical signs indicative of tubercular deposit in any of the organs of the body, and in which cases the symptoms are quite inadequate to enable us to form such a diagnosis. The truth of this assertion is shown in the case of Norton. Here we had no physical signs to show deposit in the lungs, and the symptoms she presented were calculated to lead to the diagnosis of some other disease than tubercle. This patient, æt. 41, was the subject

* For the chief part of the idea embodied in this and the next section I am indebted to Dr. Jenner, who has long taught that a continuous fever, which cannot be accounted for by inflammation of any of the tissues of the body, or by the presence of one of the specific fevers, must be considered to be tuberculosis. Dr. Jenner has drawn attention to this in respect of *acute* tuberculosis; I have endeavoured to show that it holds also in chronic forms of this disease.

of hæmiplegia of the left side of the body. She suffered from frequent twitchings of the paralysed side, accompanied with severe headache and gradual failure of the intellect. In this case the temperature was elevated for a very considerable time, and after death tubercle was discovered in the brain, lungs, kidneys, &c.

8. It is probable that by means of the temperature we can decide when the deposition of tubercle has ceased, and that any physical signs that exist are due to obsolescent tubercle and the chronic thickening of the lung tissue between the tubercular deposit.

If it be admitted that in all cases in which tuberculosis exist and tuberculization is going on, that there is an elevation of the temperature, it follows that if the temperature is normal we may conclude that the patient is not the subject of tuberculosis. Further, when patients present themselves with physical signs indicating marked consolidation of the apices of the lungs, we are justified in stating, if the temperature is normal, that the deposition in the lungs has ceased, and that the tuberculosis is in abeyance. This statement is corroborated by two cases, in both of which there were physical signs proving extensive consolidation of, with cavities in, both apices; and yet we were enabled to diagnose that the tubercle was obsolescent, and that the deposition of the tubercle had ceased, from the fact that the temperature remained at the point normal to the body whilst the patients were under observation. The correctness of the conclu-

sion was confirmed by a post-mortem examination (Frampton and Cove).*

9. It is probable, though further observations on this point are necessary, that the temperature affords a means by which we can diagnose between diseases

* Since the above was written the following case has occurred at University College Hospital, in the practice of Dr. Hare, who has kindly permitted the author to publish it :—

"Richard Gleasby, æt. 5, was admitted on July 26th. At this time the physical signs of the chest indicated very extensive consolidation of the right apex and somewhat less of the left. Moist rhonchi were heard over the entire front on both sides; this was cavernous under the right clavicle. The child was considerably emaciated, his skin was hot, face flushed, and cough very troublesome.

"Soon after his admission he improved, and on October 29th he was considered fit to be discharged. The dulness over the chest had diminished, the moist rhonchi had disappeared, and his cough was almost gone. He had notably gained in flesh.

"On the evening of the very day he was ordered to be discharged he was seized with symptoms of an altogether different character to those he had at any time previously presented. Thus, on the evening of this day he was attacked with paroxismal and very violent pain in the head, causing him to scream out loudly; vomitting soon occurred; he then passed into a dull and drowsy state, which condition increased gradually (with occasional temporary improvements after leeches and blisters were applied), and continued to the day of his death. He could, however, almost to the last be partially roused, and evidently in some measure comprehended what was said to him. The headache and vomitting, to which was added obstinate constipation, continued throughout. The skin flushed up greatly on irritation. Occasional slight strabismus, with well-marked dilatation of both pupils, was noticed. At no time was there any ptosis, perfect blindness, paralysis, or rigidity of the extremities; nor general convulsions, though it was not certain that there were not partial ones on some of the later days of the illness. The pulse was generally slow, but increased in frequency latterly.

"During the last twenty-four hours of his life a peculiar con-

in which the symptoms are either too scanty or too much alike to enable us to decide between them.

dition was noticed. His right arm and leg were in constant motion : the leg was drawn sharply up and down, or thrust outwards with a kind of jerking movement. There were no twitchings. These movements were very frequent, but not rhythmical. The right arm was tossed about some times so as even to strike his face. The movements, however, were not violent. At times he seemed to doze, when the movements were but slight, or indeed ceased altogether. The left arm and leg were motionless, but not paralysed. During this time he was unconscious when spoken to ; but slightly felt pinching of the body.

" He died on the morning of November 6th. At the post-mortem examination there was found to be a very extensive deposition of tubercle in both lungs and one or two small cavities at the right apex. The intervening lung-tissue was converted into a firm, whitish, fibrous tissue. In the lower part of the lung, where the deposition was less abundant, the lung-tissue was much too resistent ; especially so around the aggregation of grey granulations. At the apex some of the tubercle had become cheesy, and was obviously obsolescent. Altogether the appearance of this was not that of the organ in the state of active tuberculization. Dr. Hare was of opinion that,—considering the great improvement of the physical signs, great diminution of the cough, the disappearance of the rhonchus, and the increased consistence of the lung substance found after death,—all the tubercle was old, and not of recent deposition. Tubercle was also found in the pleuritic adhesions on the left side, and also in the peritoneal covering of the liver ; this tubercle was undoubtedly old. In the inferior and posterior part of the left hemisphere of the cerebellum was situated a large mass of yellow tubercle, of the size of a small chestnut. Another mass, of about the same size, was found on the upper, posterior, and inner part of the same lobe of the cerebellum. These were distinctly imbedded in the brain substance, and the latter, in the immediate neighbourhood of the tumour, was neither reddened nor softened.

" Two masses of tubercle, about the size of large peas, were found imbedded in the grey matter on the middle of the left hemisphere of the cerebrum ; and another mass, the size of a

Thus in cases of emphysema of the lungs, it is often very difficult to decide whether there is deposition of tubercle, as the emphysema may prevent us obtaining any dulness by percussion, and the other physical signs may be too slight to warrant the conclusion that such a deposition is occurring. In these cases the presence or absence of an elevation of the temperature will enable us to decide whether any tubercular deposit is occurring or not.

It is also well known that the diagnosis between phthisis and dilated bronchi is often all but impossible. If dilatation of the bronchi is accompanied by elevation of the temperature, it must be due to the bronchitis that accompanies that condition of lung; but cases are mentioned at the commencement of this pamphlet which prove that bronchitis,

filbert, was situated at the outer and inferior part of the right crus cerebri, apparently, however, not pressing on the crus.

"The tubercle found in the brain was undoubtedly of a period anterior to the recent acute symptoms. There was some opacity of the pia mater within the circle of Willis, but not greater than is sometimes met with in health. There was no inflammatory thickening of, nor deposit in, the pia mater elsewhere; but there was notably increased redness even of the finer vessels. The ventricles contained an excess of fluid."

In this case the temperature was taken by Mr. Powell from November 1st to November 6th, both days inclusive. On November 4th and 6th it rose to $100\frac{3}{5}°$ in the evening; at all other times it was normal.

The author has here given Dr. Hare's notes of the case and his opinion respecting the age of the tubercle, as he felt that, having preconceived views on the matter, he might possibly be led to consider tubercle to be old that was really not so.

with a considerable amount of moist rhonchus, is insufficient to cause any such elevation. Moreover, the temperature was taken by Mr. Arnott in one case of dilated bronchi, and it was found to be normal.

Carcinoma of the lung not unfrequently simulates phthisis. In one case of this disease the temperature was taken by Mr. Arnott, who found it to be constantly normal. Thus it is possible that the temperature is a means of distinguishing between these two conditions of lung.

Aneurisms of the aorta also, when too small to produce pressure, or to give evidence of their existence by dulness on percussion, sometimes allow a small quantity of blood to pass through their walls, which may be expectorated, and thus lead to the conclusion that the patient is the subject of phthisis. Here again we think it probable that the temperature will serve to guide us to a correct conclusion, for in one case of aneurism the temperature was most carefully taken; but on every occasion it was found to be quite normal.*

Another case was observed by my friend Dr. Rickards; here the temperature was always normal.

In diseases of the brain closely simulating tubercular meningitis the temperature affords us a means of distinguishing between them. Thus Charles

* The temperature of this patient was taken by Mr. C. E. Squarey, who was the physician's assistant in University College Hospital at that time.

Gooding, aged four years, was ill rather more than five weeks. The disease commenced with vomiting, pain in the head, and obstinate constipation. The child gradually passed into a comatose condition, from which he could only be partially roused. The head was thrown back, and was fixed so by the muscles of the back of the neck ; the muscles at this part were rigid and contracted. There was ptosis, with intermittent and fluctuating strabismus. The pupils were widely and unequally dilated ; they acted but little under the influence of light. The skin also flushed up to a very unusual degree on irritation. The respirations and pulse were very slow and irregular for a great part of the time. There was, however, no paralysis nor rigidity, nor convulsive movements in any of the limbs. In this case, which certainly very closely simulated tubercular meningitis, the temperature during the greater part of the time the child was under observation remained normal ; and from this fact we were led to conclude that the disease was of some other nature than tubercle. The correctness of this opinion was confirmed at the post-mortem examination, when no tubercle was found, nor were there any evidences of inflammation of the meninges. The symptoms were due to a large tumour situated in the inferior and anterior part of the right lobe of the cerebellum, which pressed on one half of the medulla, and also had caused very considerable effusion into the lateral ventricles. The tumour had none of the characters of tubercle.

The case of Norton has already been referred to, in whom the chief symptom was hemiplegia, certainly not a common result of tubercle in the adult. In this case there was a continuous elevation of the temperature, and the post-mortem examination showed that all the symptoms were due to numerous small masses of tubercle, the size of peas, situated upon and in the brain substance.

In the case of Woodbridge, the symptoms merely pointed to disease of the brain, with probable effusion into the ventricles; but the nature of this could not be determined, except by the help of the thermometer. In this case the temperature was persistently elevated, and on this fact the diagnosis of tubercle in the brain was made. The diagnosis was confirmed after death by a post-mortem examination.

The temperature will also be of use in enabling us to decide whether the dulness be due to tubercle or not, in cases of syphilitic thickening of the ribs, and in the case of patients with large mammæ, in whom it is impossible to decide what reliance is to be placed on the dulness obtained by percussion, as evidence of consolidation of the lungs.

A short account of each case is now given. To some the temperature is appended in the form of charts.

The vertical column gives the temperature in fifths of a degree.

Of the two horizontal columns one gives the hour of the day, and the other the day of the month.

CASE I.

James Duffield, was admitted into University College Hospital under the care of Dr. Jenner, on March 31, 1864. He remained in the hospital till June 20th. He was again admitted on July 16th, and remained under observation till August, 18th, on which day he died. The patient stated that he was in good health till the Christmas before his admission, since which time he has considerably lost flesh. Since that time he suffered from cough. His appetite never failed him, and he never spat blood. At the time of his admission he was thin and pale; he was able, however, to pass a good part of the day up and about the ward. He continued apparently in much the same general state till July 16th, soon after which date he rapidly declined; he then became much weaker, lost flesh with very great rapidity, and was constantly confined to his bed till the day of his death.

Analysis of the symptoms :—

Sweating. He only very occasionally sweated at night, till July 24th, after which time the perspiration became profuse night and day.

Sleep was generally pretty good.

Tongue was clean and moist throughout till July 31, on which day it was rather furred and dry. Throughout the whole time he suffered from slight sore throat. No ulceration was ever seen. His voice was always hoarse.

Appetite was noticed to be good on April 3, 5, and 8. Middling from April 12 to July 16; and very bad on and after July 20.

Thirst. None on April 3, 8, 12, 15; some on April 5.

Vomiting. None on March 31, April 3, 5, 19, 22, May 8, June 12, 18.

Nausea on April 8 and 29.

Vomiting, with cough, April 12, July 16, 31.

Bowels regular from April 5 to July 31. Confined March 31 and April 3. There was no diarrhœa at any time.

He occasionally complained of slight pain after food.

Cough was troublesome throughout.

Expectoration. None till July 16, when it was very scanty; on July 31st it had ceased again.

Urine contained a slight shade of albumen on June 3 and July 31. Frequent observations were made, but no trace was met with at any other time.

Throughout he complained of severe frontal headache, varying in intensity. It was paroxysmal in character. This pain was increased by excitement or exertion.

On and after April 19 he complained much of pain across his loins; worse towards evening, and apparently due to weakness.

On June 18, it was noted that there was ulceration of his gums, and that his teeth were loose.

Weight. March 31, 6 st. 4 lb.; April 9, 6 st.

4½ lb.; April 14, 6 st. 4 lb.; April 17, 6 st. 3 lb.; April 20, 6 st. 4½ lb.; April 26, 6st. 5 lb.; April 30, 6 st. 4½ lb.; May 4, 6 st. 5½ lb.; May 13, 6 st. 4 lb.: May 17, 6 st. 6 lb.; June 12, 6st. 5 lb.; June 14, 6 st. 6 lb.; June 20, 6 st. 4 lb.; July 16, 6 st. 4 lb.; July 28, 5 st. 10 lb.

He had slight hæmoptysis, amounting in all to about 3 oz., on April 29 and 30.

Physical signs of chest on March 31.

Front. Some flattening under both clavicles. Expansion less right than left.

Vocal fremitus about equal on both sides.

Percussion. Right side some dulness at outer part of infra-clavicular region.

Left, very dull over whole front, but especially so by sternum. Resonance greatly improves on passing into the axillary region.

Respiration. Under right clavicle very weak, jerking and divided. Expiration much prolonged. On deep breathing at the external part of the infra-clavicular region respiration becomes blowing. Hear also an occasional bubble of submucous rhonchus.

Left. Respiration over whole of left front weak, divided, and expiration prolonged. On deep breathing respiration becomes rather blowing, and is accompanied by rather abundant submucous rhonchus. The rhonchus is high pitched, and superficial at the acromial angle.

Back. Percussion dull, both apices, as low as the angle of the scapular. Good below this. Respiration

very blowing above; harsh below. No rhonchus heard.

May 4th. Some flattening under both clavicles. Expansion equal and good under both.

Front. Percussion. Right infra-clavicular region. Slightly dull internally; decidedly so externally. At acromial angle reaches lower than internally; the dulness extending as low as the upper border of the third rib.

Left. Whole of left front, very dull, dulness extends into the upper part of the axillary region.

Respiration very weak under either clavicle. So weak under right that it is difficult to describe it. Under left clavicle respiration decidedly blowing, and midway between the sternum and the acromial angle it is cavernous. Below the second rib the respiration becomes harsh blowing.

Hear under both clavicles a little submucous rhonchus; this is quickly lost in passing down the chest; under the left clavicle, hear a little cavernous rhonchus.

Back. Percussion dull, as low as the angle of the scapula on both sides, and markedly so above.

Respiration. On both sides above the spine of the scapula, markedly blowing. On left side expiration very hollow. Respiration becomes more open as we pass down the chest, and becomes merely harsh below the angles of the scapula. No rhonchus heard on either side.

June 12th. Front. Some flattening under both

clavicles, and expansion not very good under either, equal on the two sides. Percussion. Right side. Dulness at acromial angle reaching to the lower border of the second rib, and slight dulness at inner part of infra-clavicular region. Percussion excellent over rest of right front.

Left very dull over whole of front; and also very dull in the upper part of the axillary region; here however it becomes good as we pass downward. Get cracked-pot sound at the acromial angle.

Left. Respiration very blowing over whole front, and over the external two-thirds of the infra-clavicular region, and as low as the inferior border of the second rib respiration is cavernous. Hear a little rhonchus at the inner part of the infra-clavicular region. None elsewhere. Respiration rather blowing in the upper part of the axillary region.

Right. Respiration blowing under the clavicle as low as the second rib. No rhonchus.

Back. Percussion very bad, both apices, especially so on left side. This improves on right side, two fingers' breadth below the spine of the scapula, and on the left side at two fingers' breadth above the angle of the scapula. Respiration at the apices weak and blowing. No cavernous breathing. No rhonchus. Respiration harsh below.

July 16th. Left. Percussion everywhere dull, though not absolutely so; rather tubular in character. Dulness extends into the upper part of the axillary region, but soon improves as we pass down.

Right. Percussion not good under clavicle; worse close to sternum. Dulness reaches internally as low as the third rib, externally to the second rib. Respiration on left side cavernous all over the front, except at the acromial angle. Cavernous also in the upper part of the axillary region. Hear much cavernous rhonchus over the front, and much sub-mucous rhonchus over axillary and infra-axillary regions.

Right. Cavernous breathing audible over the whole infra-clavicular region; most marked externally and audible as low as the second rib; below this the breathing is harsh, and is accompanied in latter part with some scanty high pitched, ringing, bubbling rhonchus.

Back. Percussion on left side dull to the angle of the scapula. The percussion note is however duller above than below the angle of the spine of the scapula. On right side percussion very bad to two fingers' breadth above the angle of the scapula. Good below. Respiration very blowing at both apices, especially so on right side. A little rhonchus heard over the infra-spinous region on the right side. No rhonchus elsewhere.

Post-mortem eighteen hours after death. Lungs strongly adherent at both apices. Both lungs in their upper lobes contain several cavities. One in left upper lobe, as large as a small orange, and in right upper lobe still larger. Upper lobes of both lungs much indurated, and contain much pigment. These lobes also contain many grey granulations,

and also a little yellow tubercle. Many of the former are shrunken hard, and contained much pigment. These are probably obsolescent. Indeed both the upper lobes give all the appearance of old and long continued disease.

The lower lobes of both lungs have some groups of recent grey granulations scattered sparingly through them. There is also some patches of pneumonia in a state of low grey hepatization in those lower lobes.

Liver healthy.

Spleen healthy.

Kidneys healthy.

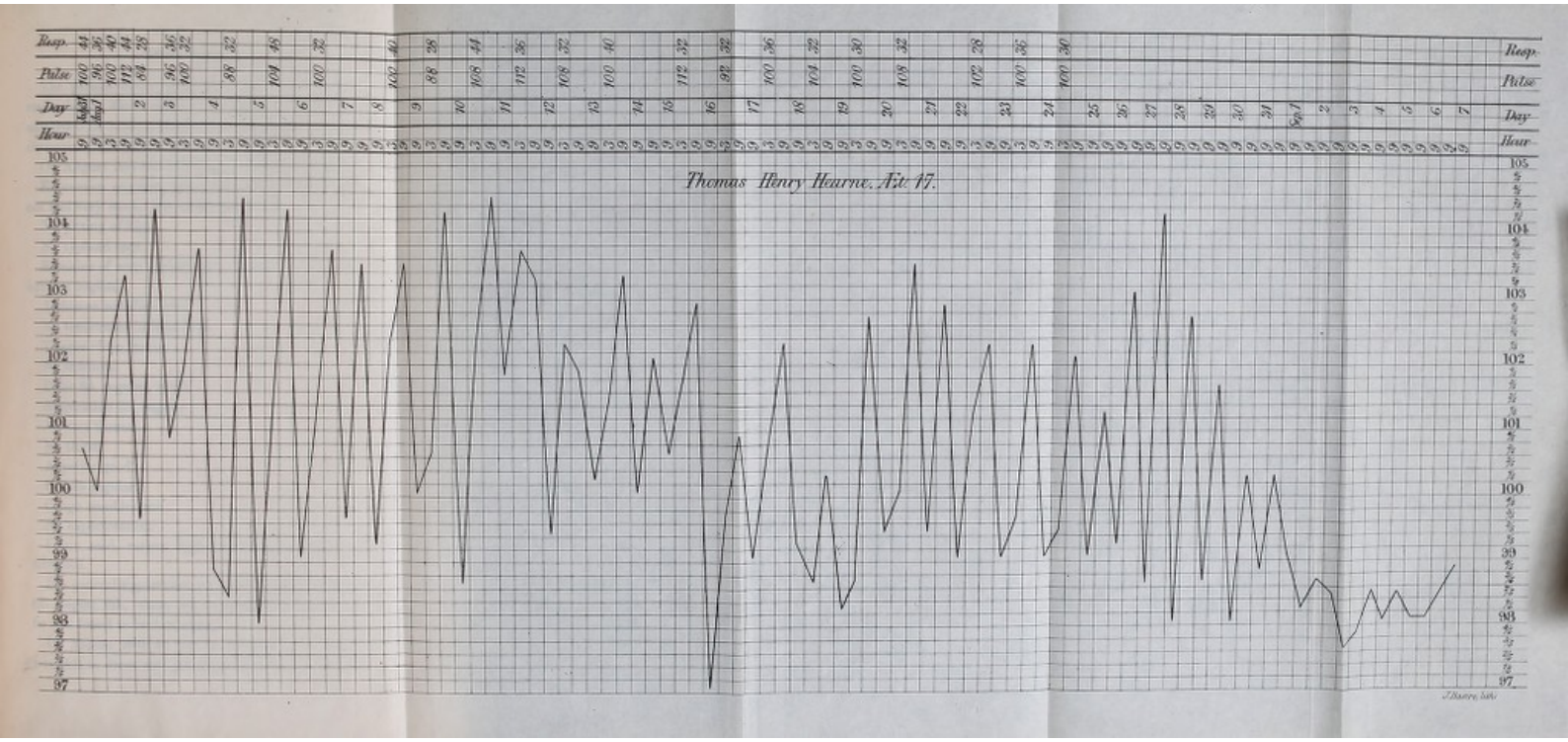
Intestines healthy.

There is an ulcer as large as a pea situated at the base of the right arytenoid cartilage.

The morning temperature during his first residence in the Hospital, from April 1st to June 20th, varied between 99° and 100°; the evening between 102° and 103°. After his second admission to Hospital, from July 16th to August 18th, the morning temperature varied between 100° and 102°; the evening between 103° and 105°.

CASE II.

Thomas Hearne, æt. 17, admitted into University College Hospital, under the care of Dr. Reynolds, on July 29th, 1864.


Thomas Henry Hearne. Ætt 17.
Resp.
Pulse
Day
Hour
105
104
103
102
101
100
99
98
97

105
104
103
102
101
100
99
98
97

The patient never had any other illness that he remembers. He is a sailor. A fortnight before his admission he became suddenly ill, and was obliged to discontinue his work. He has never spat any blood.

On August 2nd the following notes were taken :—

Expression anxious, lips rather dry; says he does not feel very weak, but nurse states he is so.

No pitting of legs.

No typhoid spot.

Remains of sore caused by a blister in left infra-axillary region.

Abdomen not distended.

No tenderness in iliac fossa.

Tongue clean, moist.

No sickness.

Pulse 84, regular, weak.

Respiration 28, regular.

No sore throat.

No thirst.

Appetite good.

Bowels regular.

Cough troublesome.

No expectoration.

Urine acid, rather high coloured; contains no albumen.

His general appearance remained much the same till August 9th, when his expression improved, and he was found to be less weak.

On August 26th he was so far improved that he was able to dress, and get about the ward; from this

time his improvement steadily progressed, and he was sent to the Convalescent Home at Eastbourne on September 7th.

On the nights of August 3rd, 4th, and 6th, the patient was very delirious, after which he slept well. His tongue was clean throughout, and he rarely suffered from thirst; there was, however, some on August 4th and 26th. His appetite was always most excellent; indeed, on August 26th it was reported to be greater than that of any patient in the ward. His bowels were regular throughout; his cough was troublesome till August 13th, after which it improved, and disappeared on August 3rd.

There was no expectoration except on August 3rd, when it was very scanty, and two of the sputa were slightly streaked with bright red blood.

There was no albumen in his urine.

The glands in the neck were never enlarged.

The heart was healthy.

His weight was, on August 7th, 97 lb.; August 13th, 96 lb.; August 19th, 97 lb.; August 24th, 98 lb.; August 31st, 101 lb.; September 6th, 108 lb.; October 3rd, after his return from Eastbourne, 122 lb.

Physical signs of chest :—

August 2nd. Chest well made; costal angle rather acute.

Expansion good and equal under both clavicles.

Vocal fremitus equal under both clavicles.

Percussion good and equal on both sides of chest.

Respiration over whole front harsh, divided, and

prolonged. No rhonchus. A dry crackle was, however, caught close to right edge of sternum immediately under clavicle.

Percussion equal and good over whole back.

Respiration weak over whole back; sibilant rhonchus heard over the whole right side, most audible at apex.

The physical signs remained much the same till August 13th. During this time we thought there was very slight relative dulness, sometimes in the right and sometimes in the left infra-clavicular and supra-spinous regions; and at other times the percussion was noted to be equal on both sides. The dulness was never so marked that we could be sure of it; once or twice a few crackles were heard, with an occasional respiration at either apex.

On August 13th there was decided relative dulness under the right clavicle, most marked at the acromial angle; and more marked still in right supra-clavicular and clavicular regions; sibilant rhonchus was heard over the whole right front, and an occasional bubble of submucous rhonchus at the right apex. There was some relative dulness in the left supra-spinous fossa; some sibilant rhonchus was heard over the whole of the left back.

On September 6th the following notes were taken:—

The chest well made; no flattening under either clavicle. Expansion good and equal under both clavicles.

Percussion. Marked dulness in the right supra-clavicular region; good in left supra-clavicular region.

Some dulness of right clavicular region.

Distinct relative dulness of right infra-clavicular region, most marked externally; especially marked on deep percussion. The dulness is lost below the second rib. Respiration rather harsh under both clavicles. Some dulness in right supra-spinous fossa, most marked in the external part of the region; dulness not extreme ; no dulness elsewhere.

Respiration normal over the whole back.

Vocal fremitus considerably increased under right clavicle.

CASE III.

Edward Reynolds, æt. 22, was admitted into University College Hospital, on April 18th, 1864.

He was first taken ill about three weeks before his admission, during which time he lost flesh, grew weak, and had slight cough. At the time of his admission he was rather weak, face a little flushed, and skin very hot. No disease could be detected in any of his organs. He gradually got worse, and the disease assumed many of the characters of typhoid fever ; thus, on April 26th, it was noted that he was very weak, his face flushed, lips dry, skin very hot, tongue rather dry. No eruption on the skin ; abdomen not distended ; some tenderness in the right iliac fossa. Some diarrhœa ; voice was hoarse. On April 29th he was so weak that he could not sit up in bed. Face was still flushed. There was some diarrhœa.

The prostration continued till May 13th, after which time he improved rapidly, and was able to dress and get up on May 22nd. From this time his improvement continued; but he was still weak and thin, though capable of taking a tolerable good walk on June 12th. During the early part of the attack he had no sweating at night. It was noted that on May 6th he sweated occasionally, and on May 22nd very profusely; soon after this, however, it ceased entirely.

There was never any eruption on the skin; the abdomen also was never distended, the tenderness in the iliac fossa continued till April 28th.

His tongue was red and furred till May 6th; after May 22nd it was moist and clean.

His appetite was very bad at first; this improved on May 22nd, and was very good on June 12th.

His bowels were relaxed till May 22nd; after this the diarrhœa ceased.

His cough was troublesome till May 6th, when it improved; and on June 5th it was very slight.

Expectoration was rather abundant on April 29th and May 1st. On May 6th it was very abundant. On June 5th it had nearly ceased.

His voice was very hoarse throughout; this improved much latterly.

Urine contained no albumen, except on May 13th and 14th, when a slight trace was detected.

Weight. May 25th, 8 st. 1 lb.; June 2nd, 8 st. 2½ lb.;

June 9th, 8 st. 8 lb. After he left the Hospital he stayed with some friends in the country six weeks, and then went to Eastbourne for three weeks; on returning, he weighed 9 st. 5 lb. Soon after this he was obliged to take a situation, and almost immediately he lost flesh, so that on October 11th he weighed 9 st. 1 lb.

Physical signs:—

His chest was often examined, but for some time nothing could be detected.

April 28th. Perhaps a little duller under left than right clavicle.

Respiration healthy; normal over the whole chest. Sonorous rhonchus heard over whole chest, perhaps a little more at the left apex than elsewhere.

March 1st. Expansion good and equal under both clavicles.

Percussion a little higher pitched and rather dull under left clavicle, but the dulness by no means marked.

Sonorous rhonchus heard over the whole right side.

Back percussion. Very slight dulness in left supraspinous fossa; some submucous rhonchus heard at left apex, and sonorous rhonchus over the rest of the back.

Though the above signs pointed to tubercular deposits in the lungs, they were so slight that we felt hardly warranted, from the physical examination alone, to pronounce the patient tubercular.

March 6th. Expansion good under both clavicles.

Percussion not very good under either clavicle ; decidedly duller under left than right clavicle.

Respiration covered under left clavicle by an abundance of submucous rhonchus ; this was heard even to the base of the lung in the axillary region, but was less marked below than above.

Back. Percussion good over whole of right side. Decided dulness over right apex as low as angle of scapula.

Respiration on right side everywhere accompanied by sonorous rhonchus.

On left side, submucous rhonchus heard over the whole lung.

May 22nd. Expansion equal and good under both clavicles.

Percussion hyper-resonant under whole of right clavicle ; rather dull under left clavicle as low as second rib ; percussion better under left clavicle than it was at last report. Respiration very weak under both clavicles; rather bronchial on both sides close to sternum in the infra-clavicular region ; a small amount of submucous rhonchus heard at left apex.

Back. Percussion duller over whole of left apex to angle of scapula than on the right side, but dulness less marked than at last report. No rhonchus.

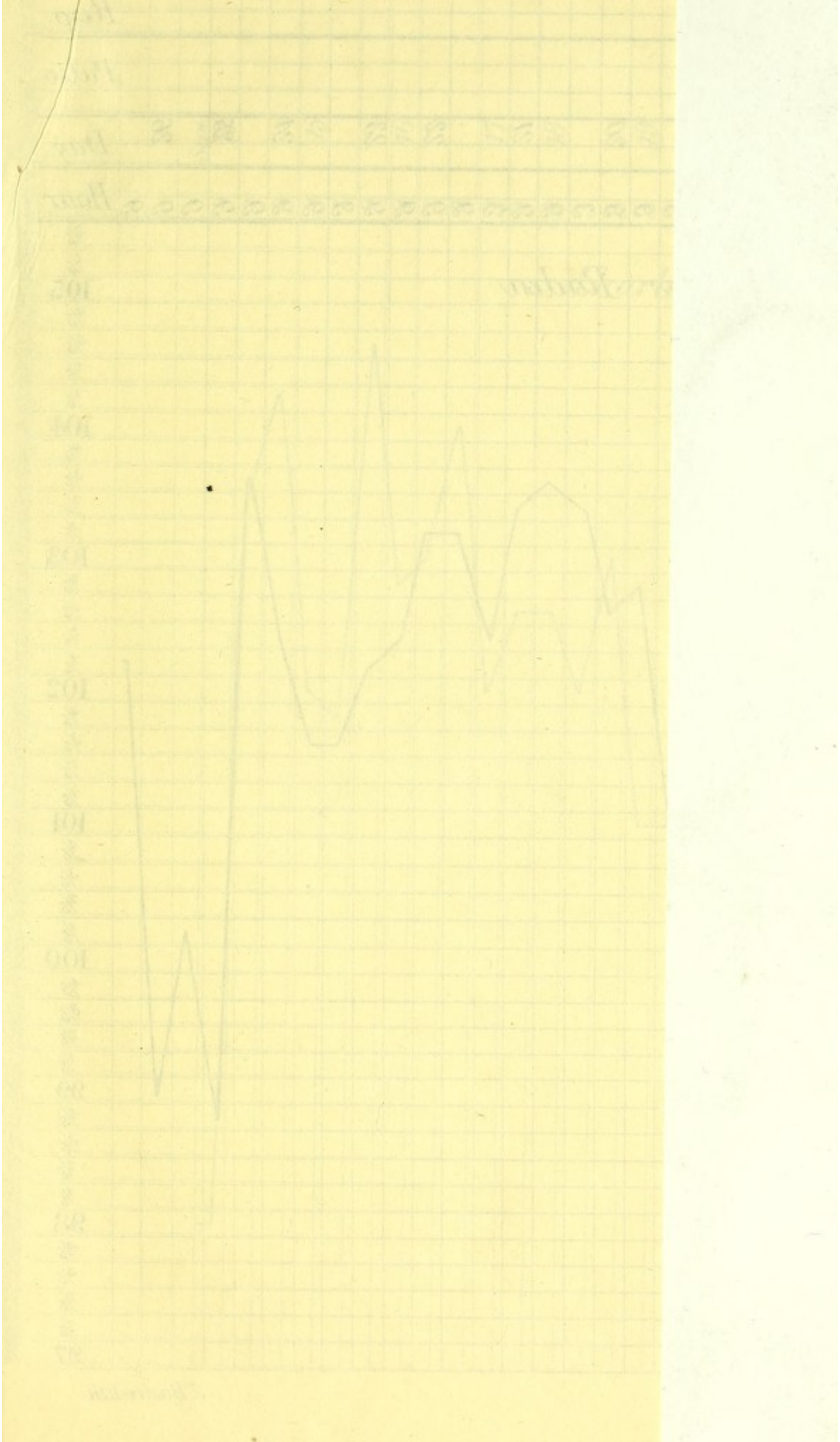
June 12th. Perhaps some flattening under both clavicles ; rather more under left than right. Expansion good and equal under both. Percussion dull in both supra-clavicular regions. Good elsewhere on the right side. Very dull under the left clavicle as

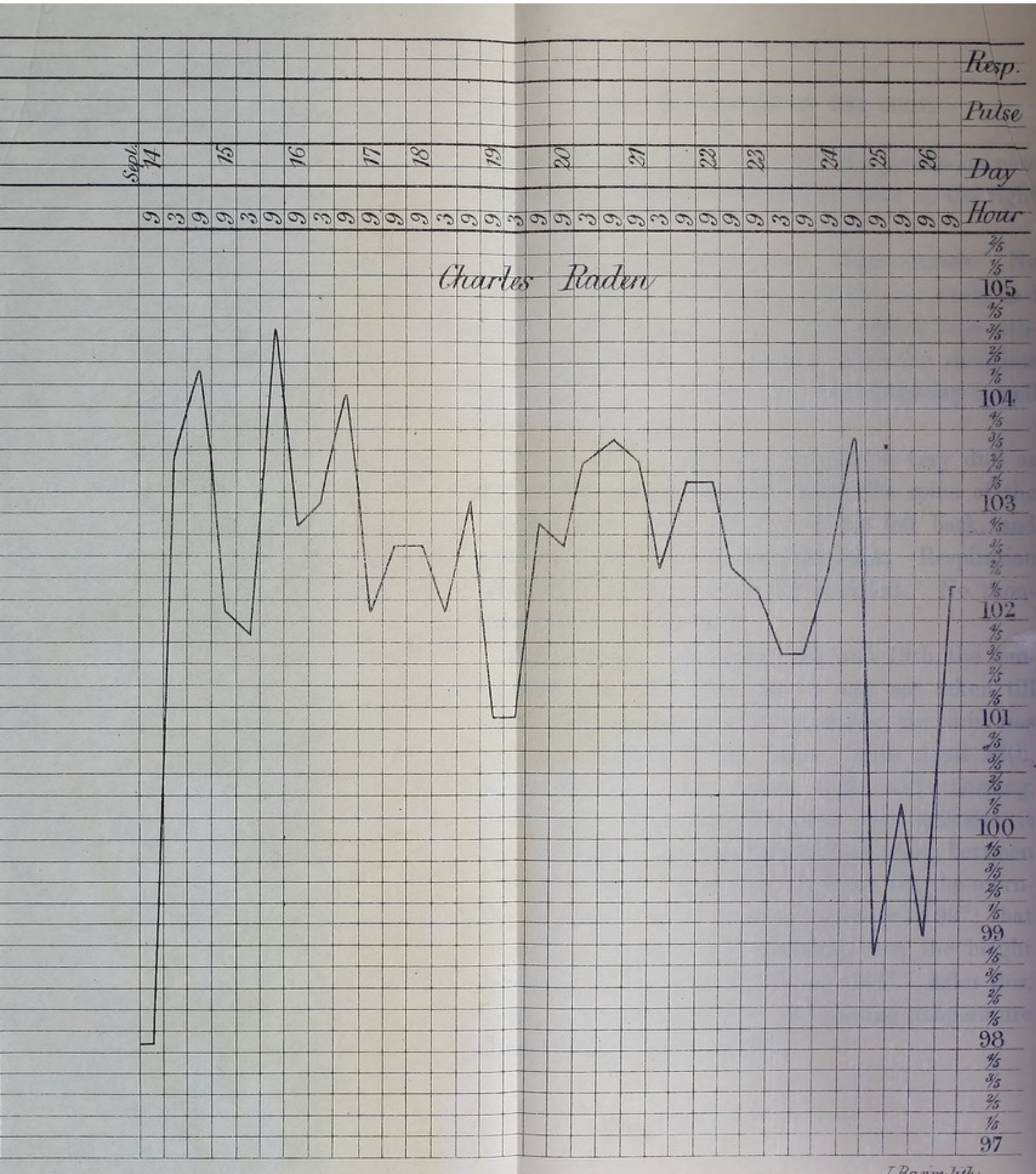
low as the second rib; below this the percussion note improves, but is rather duller there than on the right side.

Respiration very weak under right clavicle. No rhonchus heard. Under left clavicle very weak, and accompanied over the whole front with a little submucous rhonchus. At acromial angle the rhonchus is cavernous in character, and bronchophony is well marked at this part.

Back. On the left side, percussion very dull as low as four fingers' breadth below the spine of the scapula. Good over the rest of the left back, and good over the whole of the right back. Respiration weak at both apices, especially so at left. No rhonchus heard over the back.

Temperature. On April 18th and 19th, the temperature was 103°; after this it was not taken till April 28th; during this time, however, the skin was very hot, judging by the hand. After April 28th, the temperature was taken night and morning. From April 28th to May 5th, both days inclusive, it remained almost permanently high, ranging between 102° and 103$\frac{4}{5}$°. After this, till June 1st, the morning temperature fell in some instances to 99°; that of the evening, however, constantly rose, the height reached varying between 102° and 104°. After this, to the time of his discharge, the evening temperature varied between 100° and 101.°

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J. Basire lith.

CASE IV.

Charles Raden, æt. 41, admitted September 11th. This patient stated that he had suffered from frequent attacks of rheumatism. Never had any other illness except those common to children.

His present attack dates from about two months before his admission, at which time he states he caught a violent cold, and has continued poorly since. He has lost much flesh and has become much weaker. Ten months ago he spat up a few clots of blood. About a fortnight before his admission he weighed 140 lb.; on September 11th, 132½ lb.; and on September 20th, 129 lb.

September 12th. Present state :—

Expression rather anxious. Tongue dry and red, coated with a thick white fur.

Lips very dry.

Appetite very bad.

Bowels much relaxed.

Cough troublesome. Expectoration scanty. Muco-purulent. In one sputum there is a streak of blood.

Chest well made.

Slight flattening under both clavicles.

Vocal fremitus stronger under left than right clavicle.

Percussion not good under either clavicle, but very slightly duller under left than right. Dulness most marked at the acromial angles. Dulness by no means extreme.

Respiration rather weak under both clavicles. No rhonchus heard.

Back. Percussion not good in either supra-spinous fossæ. Duller right than left. Not very good over right scapular region. Good elsewhere.

Respiration very weak in left supra-spinous fossa. In right supra-spinous fossa respiration blowing and rather hollow, accompanied with a few bubbles of liquid rhonchus.

Respiration rather blowing over the right scapula and inter-scapular regions.

Vocal fremitus stronger over right than left supra-spinous fossa.

September 14th. Sonorous rhonchus was heard over the whole front of the chest, and a little sub-crepitant rhonchus at the outer part of the left infra-clavicular region.

Back. Over the right supra-spinous fossa there was heard an abundance of subcrepitant rhonchus, and at inner part of same region pectoriloquy was caught.

Heart. Impulse very weak. At base there is heard a distinct systolic and weak diastolic murmur. At second right cartilage both murmurs distinctly heard. Audible, but with much less intensity at second left cartilage.

Arterial impulse very visible in the supra-pectoral notches, and also in the bronchial artery close to the elbows.

September 30th. He is extremely weak. There

is a constant tremulousness of all the muscles of his body. Suffers from constant muttering delirium. Passes his motions under him.

Diarrhœa still continues. The patient is too weak to have his chest examined.

Post-mortem fourteen hours after death :—

Old adhesions existed between the pleuræ.

Left lung thickly studded from base to apex with recent grey granulations, most abundant at the apex. Some masses of cretaceous matter found in the lung.

Right lung presented the same appearances as left ; there were however, in addition, two or three cavities of the size of a hazel-nut, the walls of which were very thick, hard, and fibrous, and contained much pigment. The tissue between the cavities was very tough and fibrous, and was mottled with much black pigmentary matter. Some cretaceous masses were found at the right apex.

Aorta much dilated. Inner surface irregular and mottled with opaque straw-coloured and pearly-looking spots.

The aorta valves were competent ; they were, however, much thickened.

Kidneys healthy.

Liver slightly cirrhosed.

Intestines. Eight or ten ulcers of deep red colour, and about the size of a threepenny piece, were found in the mucous membrane of the small intestines.

Brain and membranes healthy.

CASE V.

Caroline Woodbridge, æt. 2 years 10 months, admitted into University College Hospital, September 1st, 1864.

Her mother states that the child has never been very intelligent, and alway different from the other children in her manner. For last nine months has complained of much pain in her head, and has gradually got worse. She used to lie on the bed in a sleepy condition, after screaming for an hour or more. For the last nine weeks has lost flesh. On July 30th the child had two fits in quick succession, and on the same evening her mother found she was quite blind.

September 9th. Child lies with legs drawn up. Skin covered with a large quantity of downy hair. Body emits a peculiar mousy odour. Eyelashes long. Lies with eyes wide open. Takes no notice of objects around her, and does not wink when the finger is suddenly brought close to her eyes. Is evidently blind.

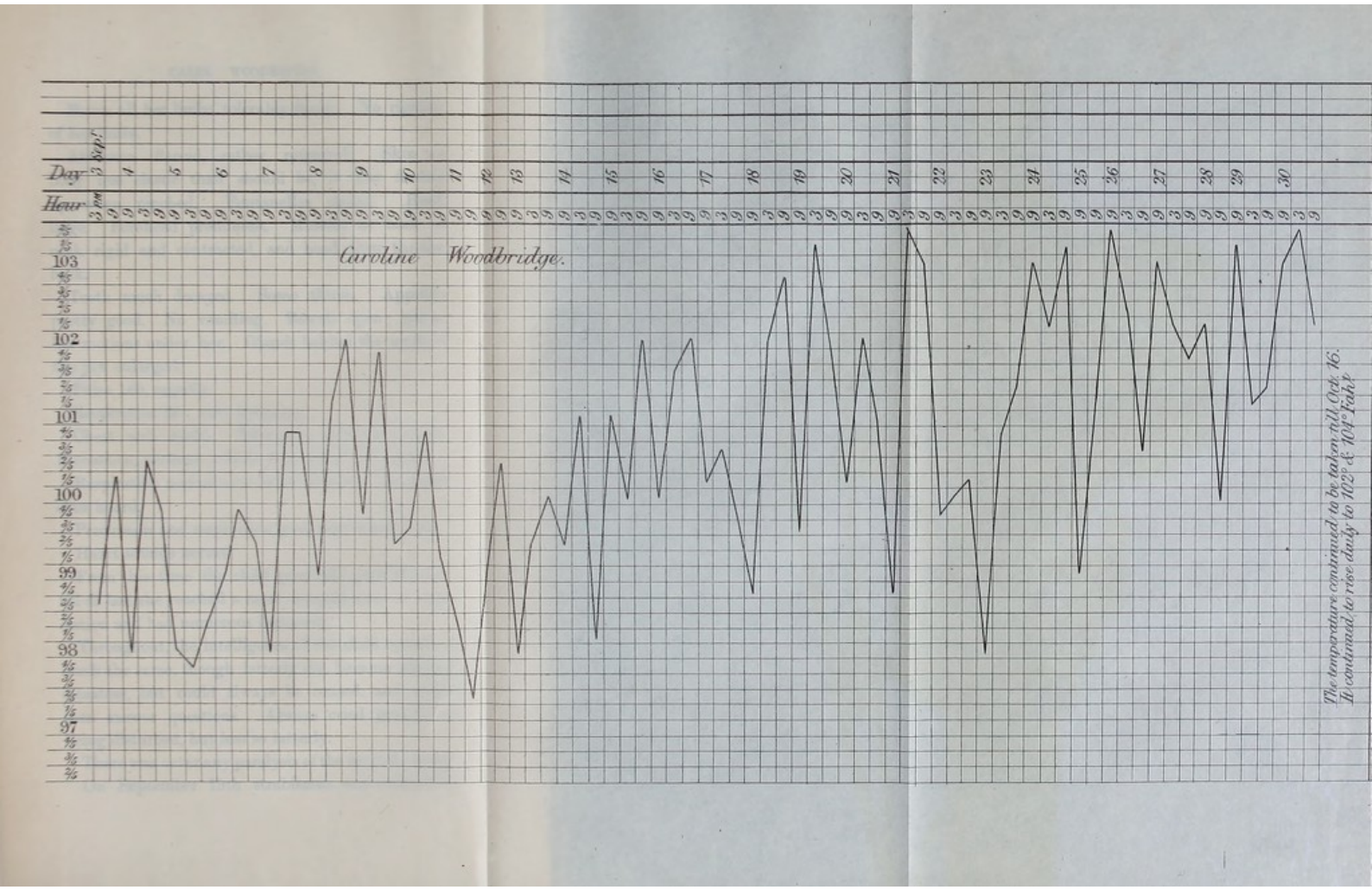
Cries much when disturbed, but is generally quiet at other times. Appears to be intelligent; at least, answers questions when spoken to.

No paralysis of face.

No strabismus.

No ptosis.

Pupils equal and of medium size.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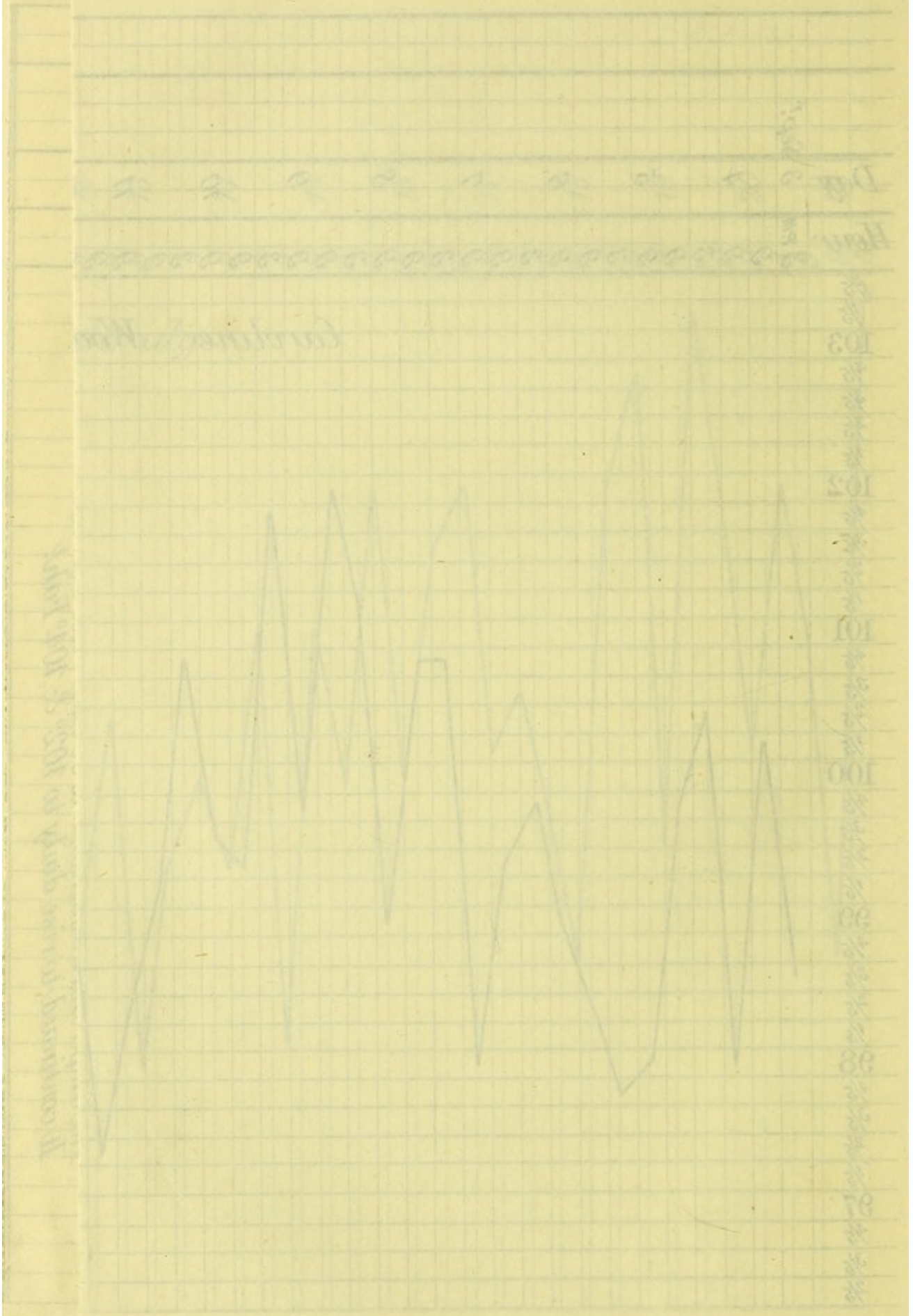
The temperature continued to be taken till Oct. 16.
It continued to rise daily to 102° & 103° Fah.t



Moves all her limbs tolerably freely. No rigidity of her limbs.

Abdomen flaccid, rather retracted. Skin of body less elastic than should be, it also flushes up when pinched. Fontanelles closed. Head large. Forehead prominent. Muscles at back of neck rigid and contracted, and head thus thrown back.

Teeth much decayed. Some thirst. Appetite pretty good. No vomiting. Bowels open; passes her motions under her. Glands behind the angle of the jaw enlarged.

Pulse 160, regular.

Respiration 20; very irregular.

Chest well made. Expansion good and equal. Percussion, perhaps, a little dull under left clavicle.

Respiration normal over front of chest. No rhonchus heard.

Percussion and respiration good over whole back.

Heart sounds normal.

From this time the child gradually grew thinner, till at last she reached a most unusual state of emaciation and had numerous bed-sores.

Throughout, the intelligence of the child remained much the same, though latterly she became slightly comatose, but could always be roused, and would then answer questions. Always cried greatly on being disturbed, but less so latterly.

There was never any paralysis of the seventh nerves.

On September 19th strabismus was noticed for

the first time; this continued throughout, though varying much in intensity; both eyes were affected. Latterly there was pretty constant rolling of the eyeballs from side to side; the movements were not synchronous in the two eyes. On September 20th, for the first time, spasmodic twitching of the eyeballs, outwards and upwards to the right, was noticed; this frequently recurred to time of the child's death.

Ptosis of left eye was first noticed on September 22nd; this varied much, and was often absent. About September 20th it was observed that the left hand was strongly extended on the wrist, and the fore-arm much pronated, whilst the fingers were flexed on the hand; at the same time the feet were somewhat drawn in, and the toes flexed on the dorsum of the foot. These conditions increased, and continued till death. On the 24th it was noticed that the child used her left arm and leg less than the right. This also continued till death. At about the same time rigidity commenced in both arms; it was most marked in the left.

Sensation did not appear to be much affected.

The gland behind the angle and along the ramus of the jaw and down the neck became very greatly enlarged.

No examination of the lungs was made after September 22nd; at that time the physical signs were nil.

On October 8th it was noted that the legs were

permanently contracted, and could not be quite extended. Child died on October 17th.

Post-mortem examination ten hours after death:—

All the limbs can be extended, but then the flexor muscles of both arms and legs become very tense.

Heart healthy.

Bronchial glands in both mediastinæ enlarged, and are enlarged by the deposition of tubercle in some cases to the size of chestnuts.

Lungs. Bronchial tubes healthy. On section, upper lobe of each was almost completely consolidated by the presence of innumerable very small grey granulations; these most numerous posteriorly, more scattered anteriorly. The granulations are about the size of maw-seeds. Upper part of the lower lobe of each lung presented the same characters as the denser portion of the upper. Inferiorly the tubercle was much more scattered. The denser portions of the lungs sank in water. The tubercle was evidently recent. There was no pneumonia nor cavities in either lung.

Liver. Grey granulations were seen on the peritoneum covering it.

Section healthy; no tubercle.

Kidneys healthy; no tubercle.

Spleen healthy.

Brain. Dura mater, which was rather adherent to calvaria, looked healthy.

Vessels of pia mater much injected; convolutions not much flattened.

On the anterior part of the right hemisphere, and situated between the convolutions, was seen an irregular-shaped mass of tubercle, which measured in either direction three-quarters of an inch. A similar mass of tubercle, but rather larger, was seen in the middle of the right hemisphere, and situated about two inches to the right of the longitudinal fissure. These masses dip down into the brain substance, the former a quarter of an inch, the latter deeper. The brain substance in the immediate neighbourhood is reddened and softened.

Brain substance generally firm.

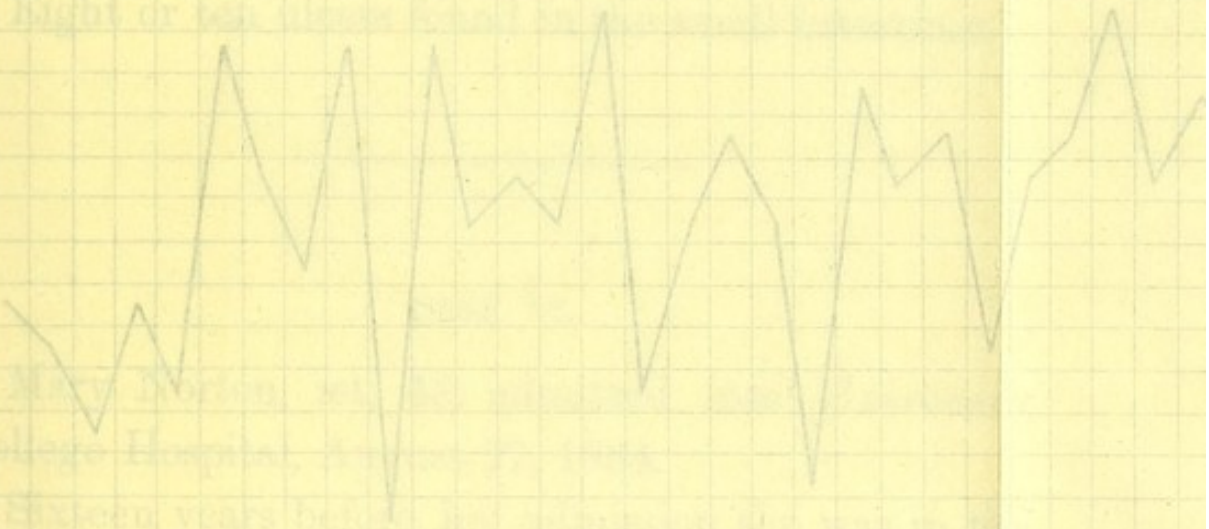
Ventricles much dilated.

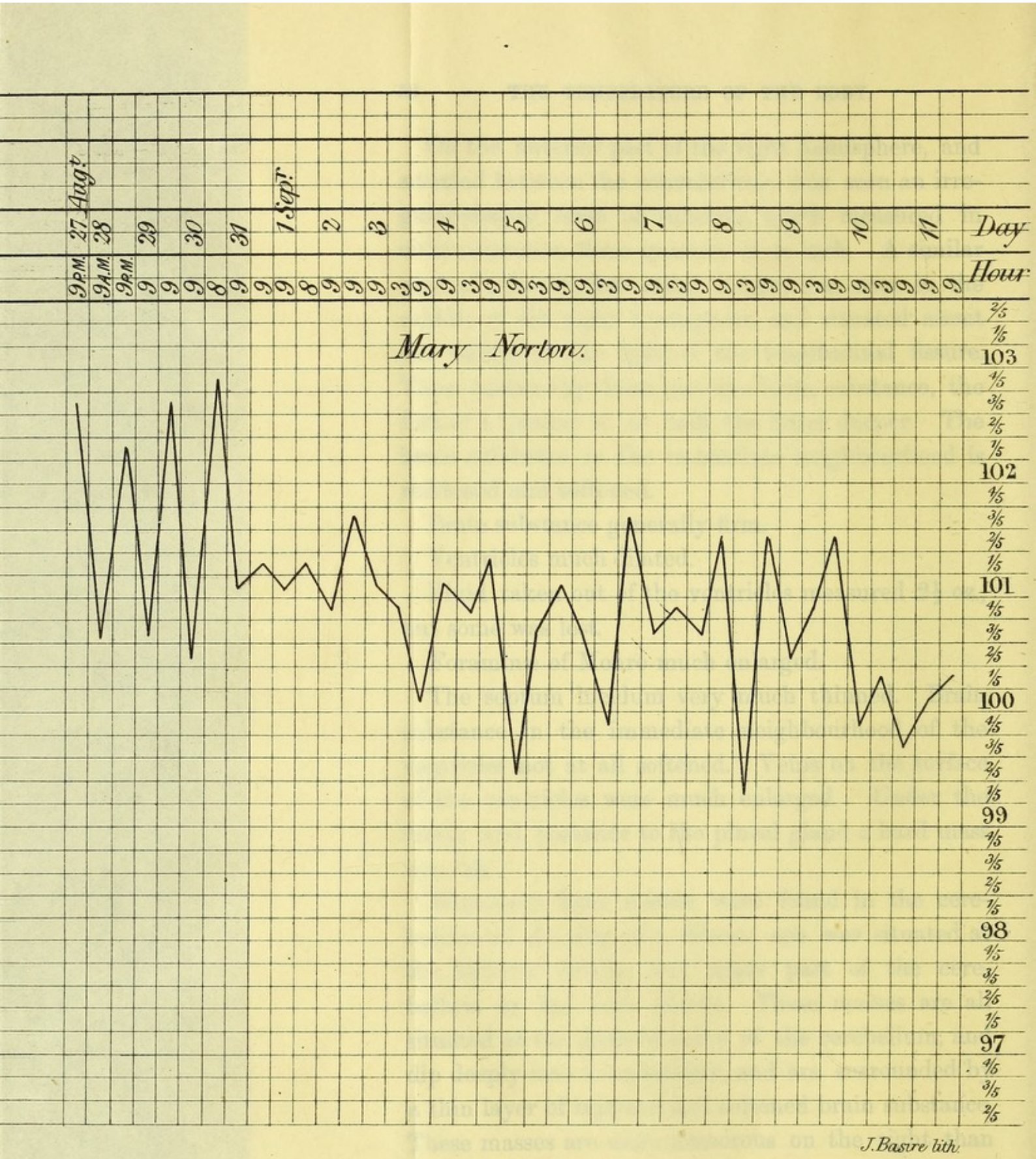
Fluid taken out of the ventricles measured $2\frac{1}{2}$ oz., but some was lost.

Foraminæ of Monro much enlarged.

The septum lucidum very much thinned. Brain substance in the immediate neighbourhood of the ventricles not at all softened. Veins on the surface of the ventricles were much enlarged. Under the fornix and posterior to the pineal gland a hard mass was felt.

Numerous hard masses were found in the cerebellum of the size of a filbert: one was situated at the anterior middle and upper part of the cerebellum by the vena Galeni. These masses are all situated at the circumference of the cerebellum, and dip deeply into its substance, and are surrounded by a thin layer of injected and softened brain substance. These masses are more numerous on the right than

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J. Basire lith.

on the left hemisphere of the cerebellum. None found on the inferior surface. On section they have all the characters of tubercle.

On the inferior surface of the middle lobe of the right hemisphere one or two of these masses were found as large as those in the cerebellum. Lamina cinerea and part immediately anterior to corpora albicantea reduced to a fibrous membrane.

No tubercle in the medulla oblongata. None in either crura nor in the pons varolii, nor in the corpora quadrigemina. Optic tracts looked healthy.

Eight or ten ulcers found in the small intestines.

CASE VI.

Mary Norton, æt. 48, admitted into University College Hospital, August 27, 1864.

Sixteen years before her admission she was in the habit of drinking to excess, and since that time she has usually taken three or four glasses of gin and some beer daily.

About a year ago she became the subject of sub-acute rheumatism, the pains attacking all her limbs, and also occurring across the loins; in the latter place it is often so severe that she can then only stoop with difficulty. These pains are worse during wet weather.

There is no history of syphilis.

About a month ago she was seized with attacks of spasmodic contractions of the fingers ; these became at such times strongly flexed on the hand. She could force the fingers open with much trouble, but without pain. On letting them go they would immediately "snap together again."

At the same time that the fingers were thus contracted her face was always strongly drawn to the left side, and she suffered from cramp-like pains in her left leg.

These spasmodic attacks lasted usually about five minutes, and sometimes occurred as often as five or six times in an hour. They continued recurring for about a week, and then one morning she found that she had lost, to a great extent, the use of her left arm and hand and leg. This loss of power of the left side has been getting worse since. After the paralysis the convulsive movements ceased, but she continued to have cramp-like pains in her left leg ; these, indeed, have become worse daily.

From the very commencement of the disease she has suffered from severe paroxysmal pain in the front of the head, passing through from temple to temple, so bad at times that she "could not see."

Has had no fits.

Has never lost consciousness.

Has had no delirium.

Appetite has been very bad.

Has never suffered from vomiting.

On August 30th the following notes were taken :

Lying on back. Expression easy. Some flattening of the left half of the upper lip, and of left side of face generally. On laughing or talking, see that the left side of the face moves much less than the right. Can, however, close both eyes equally. Masseters act equally. Protrudes tongue straight. No ptosis. No strabismus.

Pupils of medium size—equal. Sensation appears to be equal on both sides of the face.

Can only just raise the left arm from the bed; moves the left leg better, but has much less power in it than in the right. She cannot stand. She states that the paralysis gets worse.

Slight rigidity of the biceps muscle; this can easily be overcome without causing her any pain.

Fingers of left hand slightly flexed. Sensation impaired in left arm, though not lost; it improves very much at about the shoulder, and at this place is as good as on the right side. Left leg, as regards sensation, in about the same condition as the arm.

No rigidity of the left leg.

Muscles of the left arm much smaller and more flabby than those of the right arm. She states that the muscles have wasted very rapidly.

Under the influence of galvanism the muscles of both arms act about equally.

Tongue clean.

Slight thirst.

Appetite very bad.

Nausea, but no vomiting after food.

Bowels open.

Pain in head continues, still paroxysmal.

Intelligence good.

Pulse rather stronger in right than left wrist.

September 2nd. Looks more anxious.

Whimpers and cries very readily.

For the last day or so had complained of very severe pain across the forehead; she gets worse towards night.

Sleeps badly at night.

Does not wander at night.

Thinks her arm more useless than on admission; leg and face are about the same.

Had some twitching of the face yesterday and the night before last; none in arm or leg.

No ptosis; no strabismus.

Pupils equal, and of the medium size.

Masseters contract equally.

No rigidity of left arm or leg.

Tongue furred; moist.

No thirst; appetite very bad.

Bowels open. No sickness, but retches much after food.

No difficulty in swallowing.

No shortness of breath.

Pulse 84, regular.

No fulness of jugular veins.

No pitting of legs.

Has had an abundant discharge of blood from the vagina since the 27th.

Seems to be intelligent, and answers questions correctly.

Lungs healthy.

Heart apex cannot be felt; at base systolic murmur caught louder at second right than second left cartilage; weak at both. None heard at the apex.

Abdomen. Distinct impulse seen between umbilicus and ensiform cartilage, of maximum intensity midway between these two points. Impulse readily felt over the part, heaving, but not expansile. No tumour to be felt. No pain at this point. A distinct systolic murmur, increased by pressure, audible. No murmur with the second sound.

On September 7th, patient getting thinner and weaker. Paralysis of left side of face not so marked; paralysis of left arm also much improved. Can raise it easily from the bed, and move it backwards and forwards; the power, however, still much impaired. Can also move her leg better.

Had some twitching of face yesterday.

Pain in head less severe.

Complains of some tenderness on the top of her head; no swelling can be felt, nor redness seen.

Pulsation of the abdomen less.

Pulse 98, regular.

Appetite almost nil during the last five days.

September 9th. For the last three or four days the patient's manner has been strange; has been taking no notice of objects around her. When roused

talks in an incoherent manner. Frequently attempts to get out of bed—evidently delirious.

When the thermometer is placed in her axilla, will not remain quiet, but turns and rolls about the bed.

Evidently emaciates.

Lips rather dry.

Tongue dry.

Left arm in much the same condition as at last report.

No rigidity of left arm.

When arms tested by galvanism the muscles of right side move much more than left.

No ptosis.

No strabismus.

Paralysis of face much the same.

Vaginal discharge quite ceased.

Died September 12th.

Heart. Aortic and mitral valves quite competent. Heart's substance healthy.

Some dilatation of the aorta: 2½ inches above aortic valves, itm easures 4½ inches transversely.

Lungs contained grey granulations scattered from base to apex. Some of these hard and contain much pigment, and probably obsolescent. By far the larger quantity, however, recent.

Some granulations on pleura.

Spleen contained a few masses of yellow tubercle.

Grey granulations seen in the peritoneum, covering the liver. None found in the rest of the peritoneum.

Grey granulations also found in substance of the liver.

Some grey granulations seen on the surface and in the centre of the kidneys.

Some ulcers and enlarged glands in the small intestines.

Mesenteric glands contain much tubercle.

Abdominal aorta healthy.

Brain. Surface of brain much injected; not more so posteriorly than anteriorly. Convolutions not flattened. No excess of serum in the meshes of the pia mater; no inflammatory thickening. On the surface of the right hemisphere, imbedded in the substance of the brain, are seen two round masses of tubercle about the size of a large pea; brain substance around injected and softened.

Section of brain. At the junction of the middle and posterior third of cerebrum on the right side, and situated on the surface, involving chiefly the grey matter, is seen an aggregation of similar masses of tubercle; the brain substance around is injected. A few similar scattered bodies are seen in the anterior part of the section. In the posterior part of the left section one or two similar bodies are seen at the surface of the brain. On making a deeper horizontal section of brain, see some of these bodies imbedded in the middle of the white substance.

Fluid in ventricles somewhat in excess. Septum lucidum rather soft. Foramina of Monro and the descending ventricles rather dilated.

Base of brain. Membranes a little thickened at

the circle of Willis, and in Sylvian fissure. No tubercle seen here.

No tubercle seen pressing on either crus from without.

One mass of tubercle similar to those mentioned seen in the posterior surface of the right hemisphere. One of these masses found in the right thalamus opticus, and another in right corpus striatum.

Left thalamus opticus and corpus striatum healthy.

In the centre of the pons is seen one of these bodies embedded completely in the brain substance. This is situated in the upper part of the pons, and rather inclined to the left than right side of the middle line. Another also found in the centre of the right crus cerebri. Cerebellum healthy.

CASE VII.

Ann Cove, æt. 27.

Two years before her admission into Hospital she had an attack of acute rheumatism. After recovering from this she had an attack of "bronchitis," which confined her to bed for two months, and left her poorly for another two months.

At this time she spat some blood. Since this attack she has been able to lie only on left side. She has been an out-patient at University College since February. At this time phthisis, with excavation at the left apex, was discovered.

She cannot say when the present illness began. Has had no pain in the left side, and has not suffered from any feverishness.

August 30th. Rather thin and pale. Expression easy. Sleeps badly. No eruption on body. No pitting of legs. No fulness of jugular veins. Tongue clean. No thirst. Appetite bad. Occasionally vomits with her cough.

Pulse 100, weak. Respiration 36, regular.

Cough frequent, hacking, and troublesome.

No expectoration.

Chest. Much fulness of whole front of chest, especially of the sternal region. Costal angle very obtuse.

Vocal fremitus well felt over whole of right front; felt also under left clavicle, but much weaker than on the right side. Not felt at left base, nor in infra-axillary region.

Percussion absolutely dull over whole of left front. Immediately under clavicle, tubular. Tubular also over whole of sternum, and especially so above. The dulness extends about one finger's breadth to the right of the sternum. Percussion good over the rest of the right side above the fourth rib, below which it is absolutely dull.

Heart felt beating in fifth interspace about two inches to the right of the sternum.

Respiration over the sternum, tracheal; scarcely audible on left, normal on the right side, and everywhere accompanied with a little submucous rhonchus.

Back. Some fulness on the left side. Spine rather curved ; concavity to the right.

Percussion absolutely dull over whole left back. Very dull also in the right supra-spinous fossa, and right interscapular region.

Percussion extra resonant over the rest of the right side.

Vocal fremitus well felt over the whole of the right side ; just perceptible at the left apex ; none felt over the rest of left side.

Respiration very blowing and rather hollow in right supra-spinous and interscapular regions. Over the former region hear a little submucous rhonchus; none heard over the rest of the back ; normal over the rest of the right back. Respiration cavernous in left supra-spinous fossa ; scarcely audible over the rest of the back. A small amount of submucous rhonchus heard over the left supra-spinous fossa.

Heart healthy.

Liver and spleen not enlarged.

The patient's breathing grew worse, and on September 7th the chest was tapped. Fifty-six ounces of fluid were drawn off. This was followed by immediate relief of the breathing. The physical signs of the chest also greatly improved.

After the tapping, however, there were evidences of pneumothorax. The patient suffered from most severe pain ; the breathing gradually got worse, the pulse became very frequent, the skin very hot. She died on September 14th.

Post-mortem :—Chest was punctured under water, and 920 cubic centimetres of air were measured off : a very little escaped.

Heart was very much displaced. The fluid in the left pleural cavity measured 2280 cubic centimetres ; under the microscope this was seen to be purulent.

Left lung was much compressed, and there were firm adhesions at the apex.

No fluid in the right pleura.

There were a few tough adhesions at the right apex, and very soft adhesions between the apex of the heart and the pericardium. The heart's surface was covered with a thin layer of lymph (recent).

Heart substance and valves were quite healthy.

Right lung. The pleura covering the apex was much thickened, and the upper lobe felt hard, airless, and nodular. On section two small cavities were seen at the apex, one as large as a chesnut. The walls surrounding these were very thick, hard, and fibrous, and throughout this lobe there were numerous bodies, of the size of millet seeds, very hard, could not be broken down by the nails, looked contracted, and gave a somewhat wrinkled look to the lung substance. In and around these bodies there was much pigment. They had all the characters of obsolescent grey granulations. The lung substance around was very tough and hard, feeling as if chiefly converted into fibrous tissue, and was coloured with

much pigment. In the upper part of the lower lobe there were several small cavities, and scattered through the lobe in groups were similar bodies to those described above. In many of these small bodies little cretaceous masses were found.

Left lung was much condensed; in other respects it corresponded to the right lung.

In liver some bodies, having the character of old tubercles, were seen.

Kidneys slightly contracted, otherwise healthy.

Spleen healthy.

Intestines healthy.

Brain and membranes healthy.

CASE VIII.

Sarah Frampton, æt. 8. Admitted into University College Hospital, July 27th, 1864.

About two years before her admission had an illness which lasted several months. At that time she lost flesh greatly, and had a severe cough. Of this she got better; but since then she has had several similar attacks.

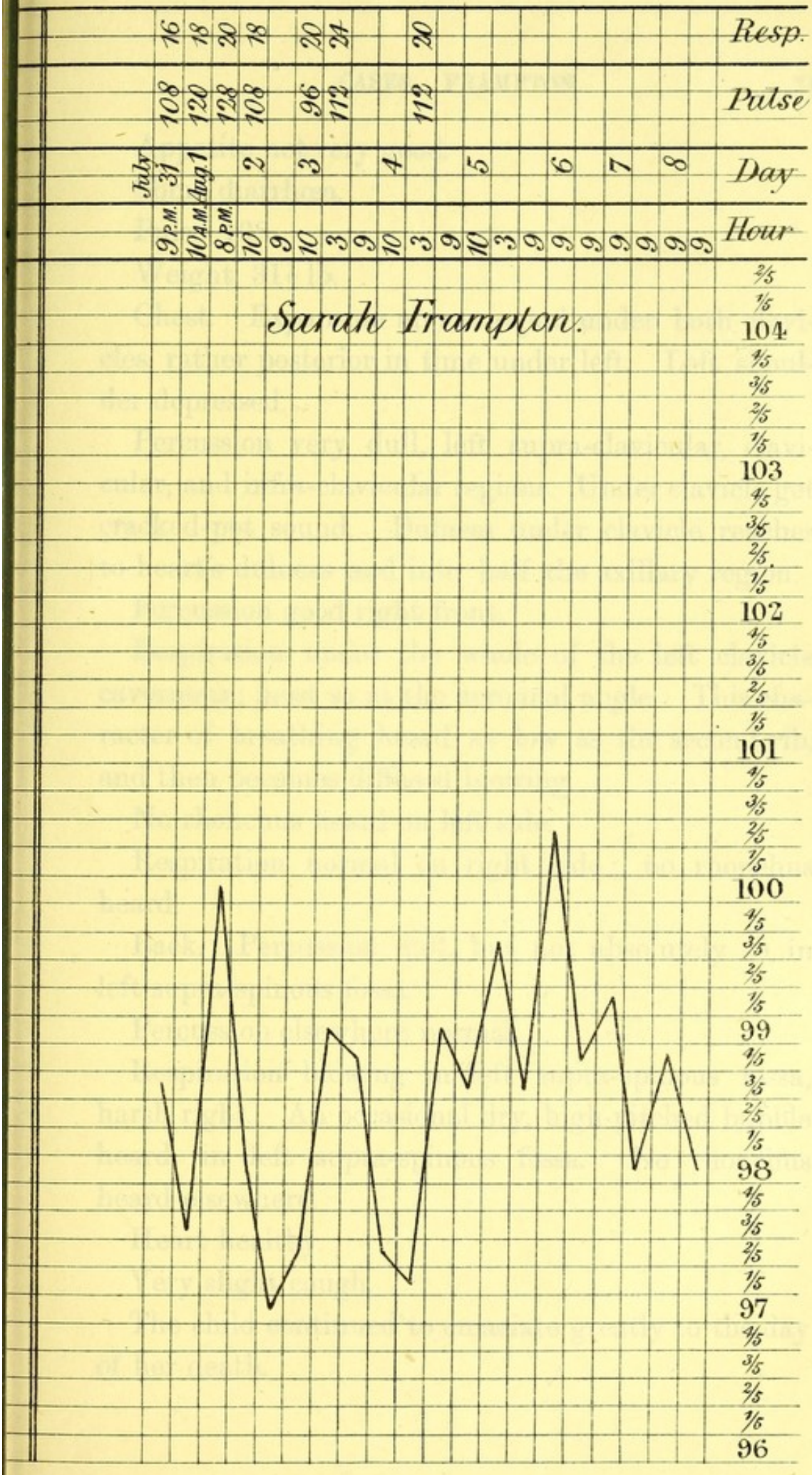
July 21st. Child very pale. Expression anxious. Much emaciated. Skin rough.

Spleen not perceptible to touch.

Liver not enlarged.

Glands in neck, axilla, and groin normal in size.

Tongue clean.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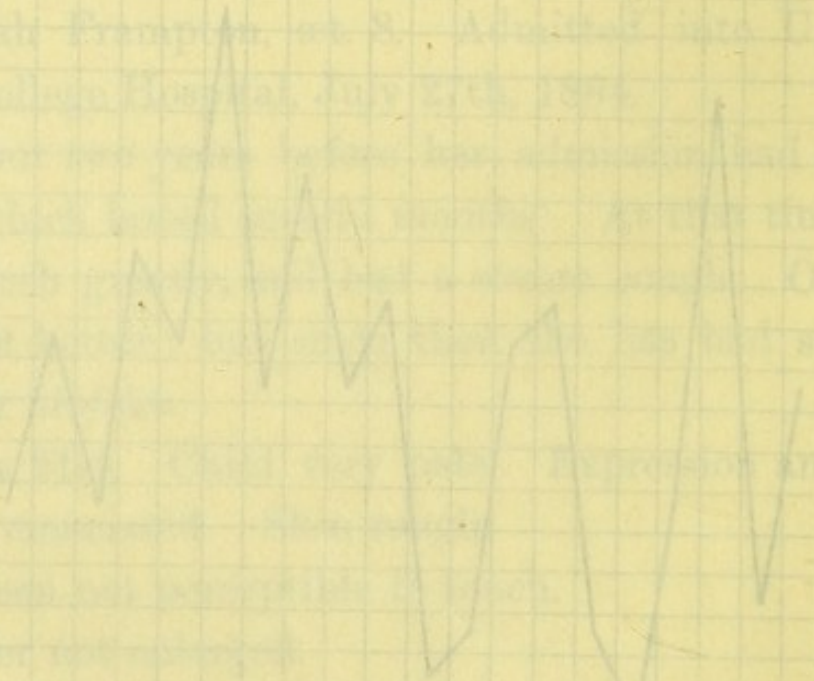


Appetite not very good.

Some diarrhœa.

Pulse, 108.

Weight, 31½ lb.

Chest. Expansion almost equal under both clavicles, rather posterior in time under left. Left shoulder depressed.

Percussion very dull, left supra-clavicular, clavicular, and infra-clavicular regions. Under clavicle get cracked-pot sound. Dulness under clavicle reaches to heart's dulness and into half the axillary region.

Percussion good right front.

Respiration under the whole of the left clavicle cavernous; most so at the acromial angle. This character of breathing heard as low as the second rib, and then becomes diffused blowing.

No rhonchus heard on left side.

Respiration normal on right side; no rhonchus heard.

Back. Percussion dull, but not absolutely so, in left supra-spinous fossa.

Percussion elsewhere normal.

Respiration blowing in left supra-spinous fossa, harsh right. An occasional dry, high-pitched bubble heard in left supra-spinous fossa. No rhonchus heard elsewhere.

Heart healthy.

Very slight cough.

The child continued to emaciate greatly to the day of her death.

Appetite throughout was very bad. The bowels were open twice or three times daily; the motions were liquid, of a light colour, and very offensive. On August 5th she complained of much pain in the abdomen, paroxysmal in character; there was much tenderness on pressure; the legs were drawn up.

On August 5th she weighed 30½ lb.

She died on August 12th.

Post-mortem :—

No evidences of peritonitis.

Heart healthy.

Glands in anterior and posterior mediastina scarcely enlarged.

Lungs. Left upper lobe feels hard, and is of a dark-slate colour; it feels airless. Pleura covering it greatly thickened. The glands close to the root of this lung contain much cretaceous matter.

Section. Upper lobe, quite airless, contains numerous cavities, one the size of a chesnut; walls of these very thick and fibrous; lung substance between these collapsed, very tough and hard, and of a dark iron-grey colour. In some places cretaceous masses seen. No recent tubercle found. In the lower lobe see aggregations of round bodies, size of pin's head, grouped together; these are extremely tough, impossible to break them down, and they contain and are surrounded by much pigment. They have all the characters of obsolescent grey granulations.

Right lung. Upper surface of superior lobe very irregular, of a deep iron-grey colour, and feels hard,

and at the extreme apex quite airless. On section, some cretaceous masses seen at the apex, and in the neighbourhood of these see some bodies having the same characters as those seen in the inferior lobe of the left lung. A very few also found scattered through the lower lobe.

No tubercle in the omentum, nor in the peritoneum covering any of the abdominal organs.

Liver, normal in size, looks healthy. Capsule strips off readily. By iodine it gave evidences of very early albumenoid disease.

Kidneys healthy; not affected by a solution of iodine.

Spleen enlarged. Section firm. Has a translucent appearance, and is studded by bodies looking like boiled sago. Gives albumenoid reaction with solution of iodine. Contains no tubercle.

Mesenteric glands give evidence of early albumenoid degeneration with iodine solution.

Get the same reaction in the mucous membrane of the stomach and small and large intestines.

The reaction not obtained in the bladder.

The intestines were most extensively ulcerated throughout; in some places almost the whole of the mucous membrane was involved. In the floor of some of these see little bodies looking like tubercle; but too few to have caused the ulceration. The ulcers, moreover, have not the characters of tubercular ulcers.

Some ulcers seen in the large intestines.

CASE IX.

Charles Gooding, æt. 4.

The child enjoyed pretty good health till three weeks ago. His intellect, however, has always been somewhat imperfect.

Three weeks ago the child became ill. Has vomited twice daily; has complained of severe pain in his head; and during this time his bowels have been very confined. There has been no delirium.

August 12th. Child well nourished. Lies with eyes open, but does not notice anything that is going on around him; apparently unconscious; he can, however, be roused from this; and on pinching his limbs withdraws them, and utters at the same time a sharp cry; but when left alone he quickly relapses into his former condition.

Body emits a most disagreeable putrid odour. Surface of body flushes greatly on being irritated.

Slight ptosis of right eye.

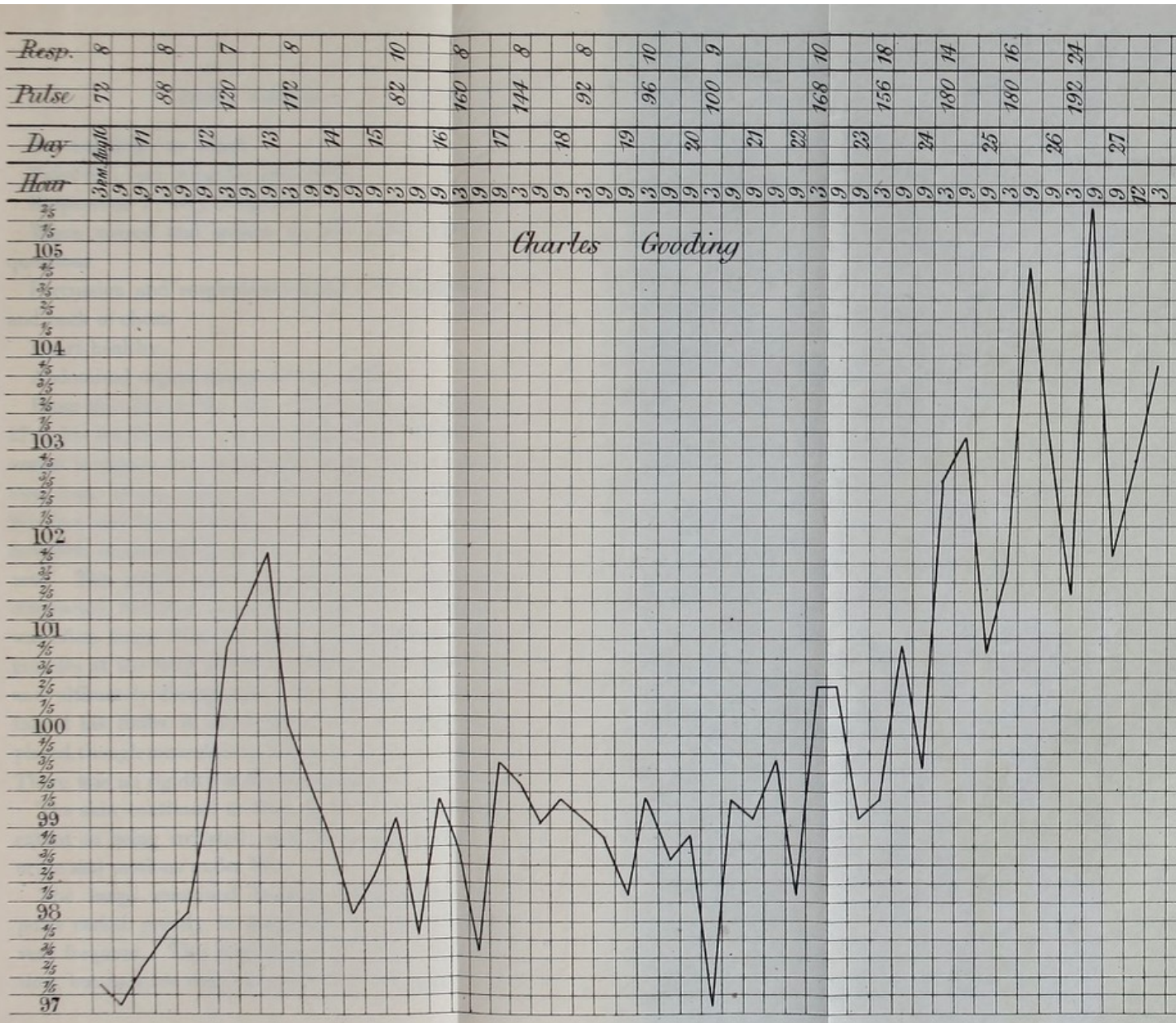
Varying strabismus of both eyes. Pupils of medium size; left larger than right. No paralysis of the seventh nerve. No paralysis nor rigidity of any of his extremities. Muscles at the back of his neck extremely rigid, and the head is thrown back.

Abdomen not retracted.

No eruption on body.

Lips dry; tongue moist, furred.

Appetite very bad. Bowels confined; passes fæces and urine under him.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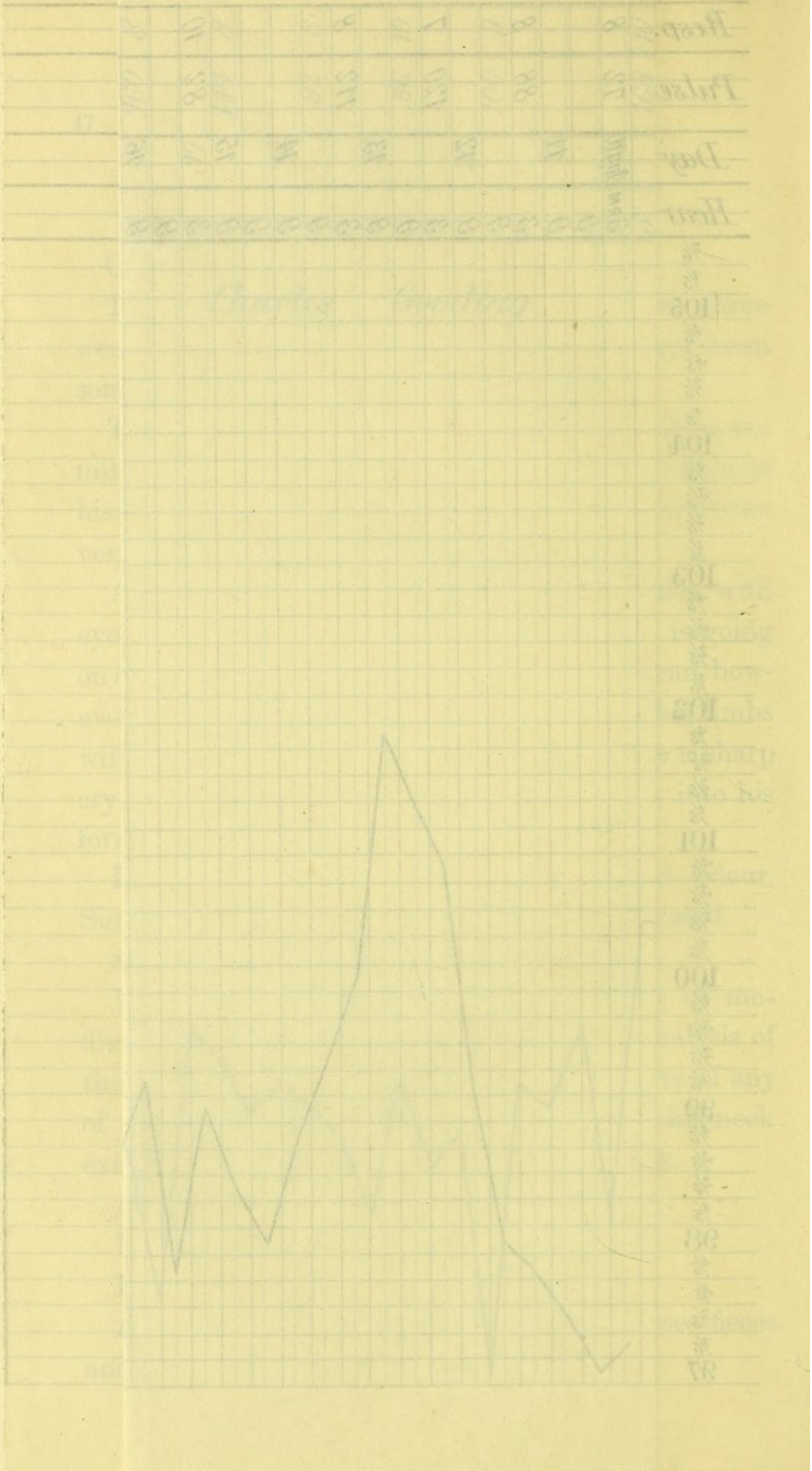
Charles Gooding



No vomiting; no cough.

Pulse 84; very irregular and weak.

Respiration 7; very irregular.

When roused and spoken to, the child answers questions.

Percussion and respiration normal over both front and back of chest.

Heart healthy.

Abdominal organs appear to be healthy.

From this date to the time of his death, on August 27th, his intelligence, though always much impaired, varied in degree, but latterly he became quite comatose, from which condition he could not be roused. His face and limbs were never paralysed; there was, however, occasional ptosis with intermittent strabismus. The pupils varied in size, sometimes being contracted, but more generally dilated; the left pupil was often larger than the right. The rigidity of the muscles at the back of the neck gradually grew less, and ultimately disappeared. On August 15th he retained his limbs in any position in which they were placed, though muscular exertion was required to do so. There was no rigidity of the extremities at any time.

The skin continued to flush up to a very unusual extent on being irritated; and he always passed his urine and motions under him.

The lungs remained healthy throughout. The pulse varied greatly in frequency, but latterly was very frequent. The respirations at first were very slow, but in a few days became rather frequent.

Post-mortem :—

Lungs healthy.

Heart healthy.

Liver, spleen, and kidneys healthy.

Peyer's patches in the small intestines ; and the chief part of the mucous membrane of the large intestines is stained of a deep iron-grey colour. The mucous membrane of large intestines was also much softened.

Brain. Membranes healthy.

Convolutions flattened.

Ventricles contain 10 oz. of clear limpid fluid, and are thus much dilated.

Cerebrum healthy.

Cerebellum. Situated in the anterior and inferior part of the right hemisphere, is a large tumour the size of a Maltese orange, irregular on the surface, and of a dull opaque white colour. Feels tolerably hard. On section, however, it is found to be rather soft ; in some parts of a dull grey colour, in others of a light pink. The surface of the section is mottled with ramiform vessels. In one part the section is stained with a greenish-yellow colour. It does not at all look like tubercle.

This tumour pressed on the right half of the medulla oblongata, and had caused considerable atrophy of the half.

CASE X.

Henry Dickson, æt. 9. This was an ordinary case of tubercular meningitis. He was first taken ill on September 13th, and died on October 1st.

At the post-mortem examination numerous grey granulations were found at the base of the brain, and at the part of the brain corresponding to the temporal region. There was some effusion into the ventricles. All the other organs of the body were healthy, and free from tubercle.

The maximum temperature reached each day varied between 100° and 102$\frac{3}{5}$° Fahr.

CASE XI.

Emily Rogers, æt. 7, was admitted into University College Hospital on April 7th, 1864.

The child on her admission was rather pale and delicate looking. She slept well; had no night sweats. Her tongue was clean, appetite good, and bowels regular. She had no cough.

During her stay in the Hospital she continued in the same state.

Her weight on admission was 49 lb.; on April 12th, 49$\frac{1}{2}$ lb.; April 18th, 48 lb.; April 22nd, 50 lb.; April 26th, 50 lb.

The physical signs of the chest remained the same during her stay in Hospital. Expansion was good and

equal on both sides. Percussion over right front excellent; very dull over whole of left front, and rather dull in the axillary region. Some dulness over the top of the sternum.

Respiration was normal on the right side. No rhonchus was heard. On left side blowing, and at the outer part of the infra-clavicular region cavernous. Occasionally a small quantity of submucous rhonchus was heard over the left front. Respiration over the top of the sternum, tracheal.

Back. Much dulness in left supra-spinous fossa, and some in left interscapular region. Percussion good over the rest of the left side, and good over the whole of the right back.

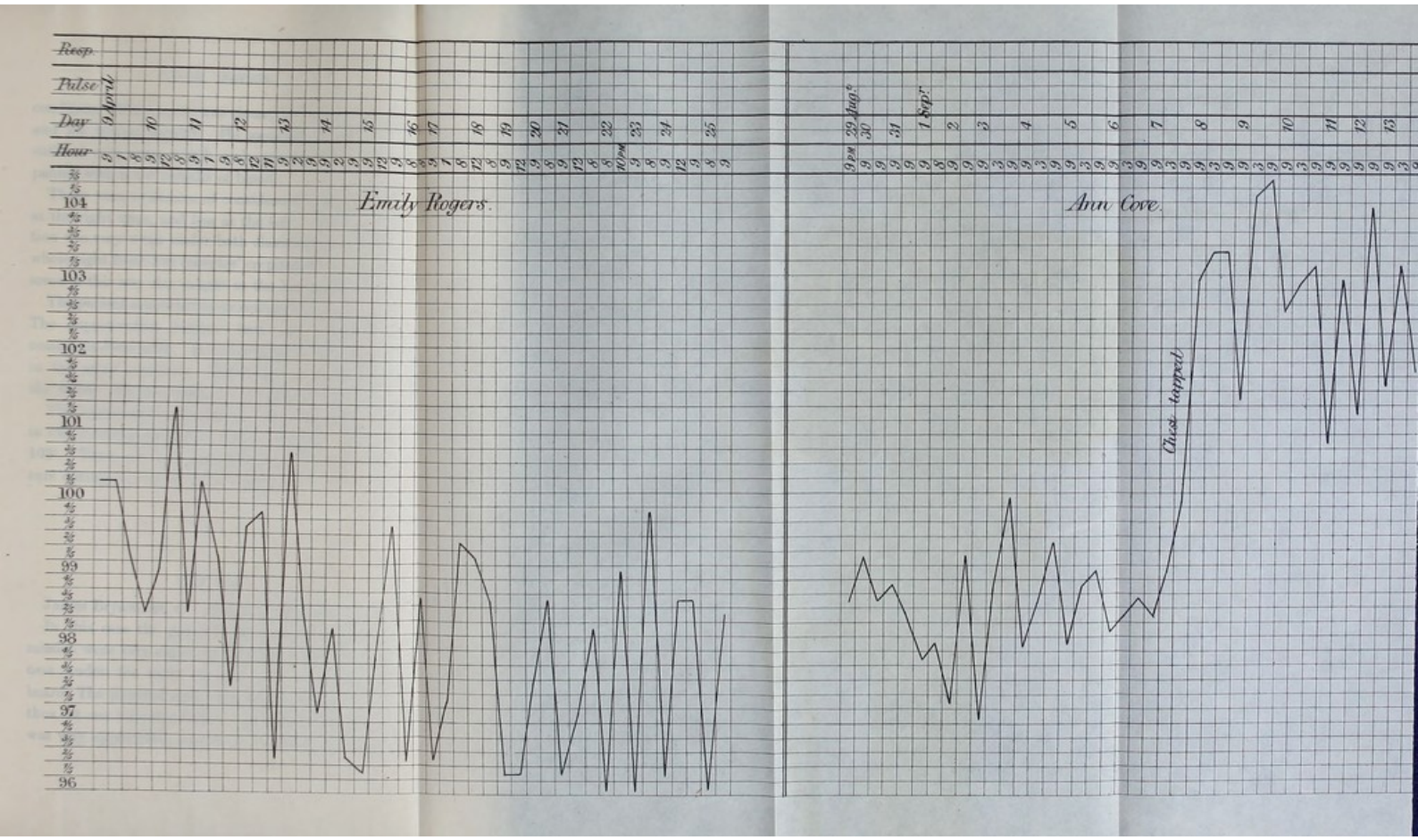
Respiration blowing at the left apex, and cavernous at the outer part of the supra-spinous fossa. A very small quantity of submucous rhonchus was occasionally heard.

CASE XII.

George Thompson, æt. 21. Admitted June 11th.

He had an attack of hæmoptysis about a year before his admission, and about two months after this he noticed that his cough, which had been troublesome for years, was worse. He had another attack of hæmoptysis six months ago. During the last year he has lost flesh.

At the time of his admission he was in pretty good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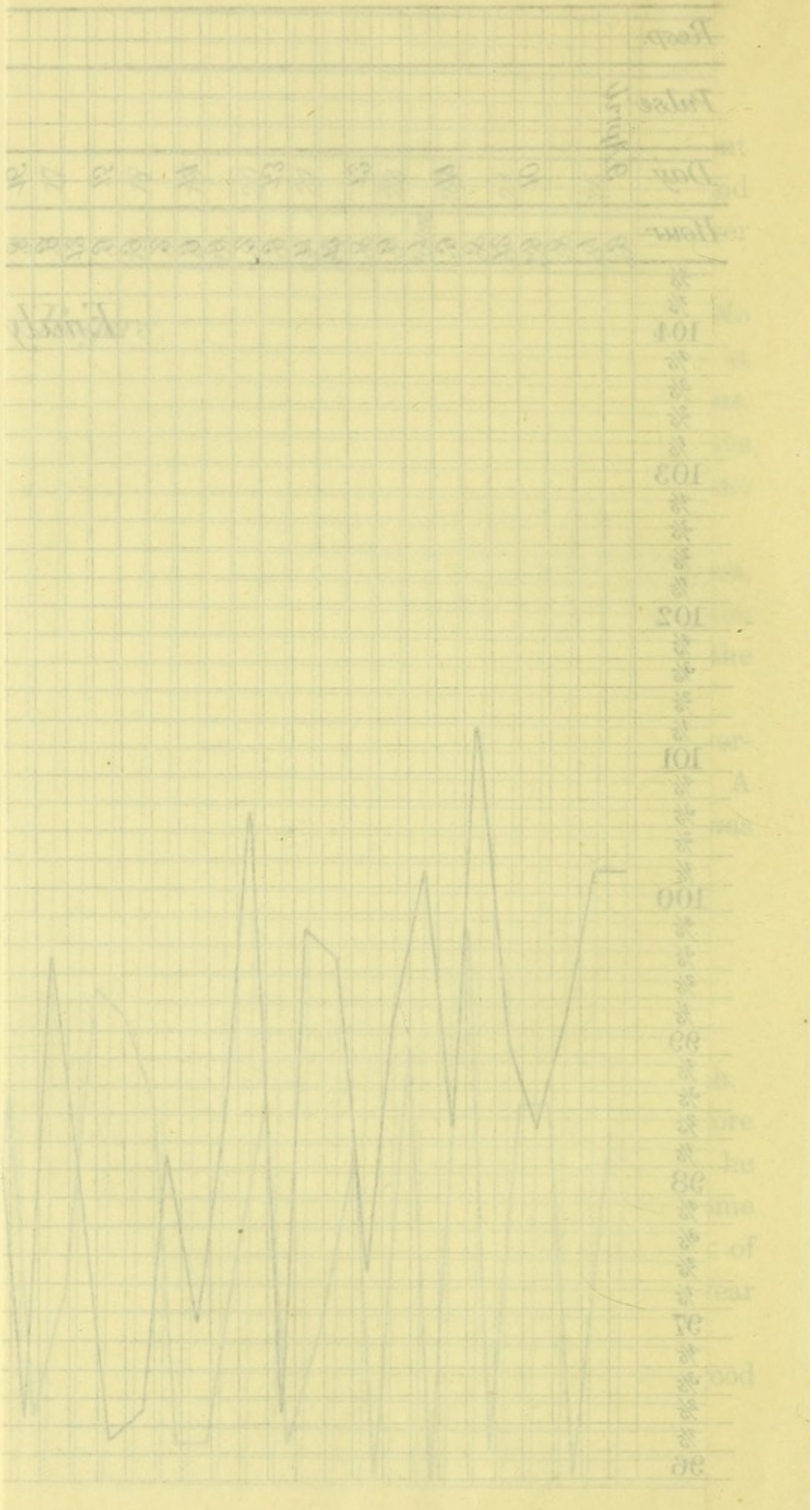

condition. His tongue was clean; his appetite fair; and his bowels regular. He sweated at night; he suffered with some cough and expectoration, accompanied with a few streaks of blood.

There were evidences of considerable consolidation at the right apex, and less at the left. The respiration was very weak under both clavicles, and over the whole right front five minutes' crepitation was heard; some of this was also caught at the base posteriorly.

The patient somewhat improved, gained in strength. The expectoration became less; the hæmoptysis ceased on June 29th. In other respects he remained in the same condition. There was no albumen in the urine. He was made an out-patient July 5th.

The temperature in this case was always normal in the morning, but rose every evening to 102° or 103°. There was no improvement in the temperature during his stay in the Hospital.

CASE XIII.

James Bryson, æt. 6. Admitted April 23rd, 1864.

In this case the physical signs on the child's admission were very slight, there being only slight dulness under the right clavicle. No rhonchus was heard. The physical signs subsequently varied much; thus, at one time the dulness under the left clavicle was very appreciable, and there was distinct dulness

in the right supra-spinous fossa; but on May 24th the percussion had become equal under both clavicles, and there was no rhonchus heard.

At first the child continued in much the same condition as on admission; during this time the appetite was good. Subsequently the appetite failed, and the child became rapidly worse.

On May 20th there was much tenderness over the abdomen, and a distinct tumour was felt in the right iliac fossa. The tumour subsequently increased somewhat, and the tenderness remained. On June 5th the urine contained some pus, and the child complained of great pain whilst making water. His urine was never examined.

Child died on June 12th.

Post-mortem. The intestines were glued firmly together, and part of them formed a distinct tumour in the right iliac fossa.

There was no perforation of the intestine.

Lungs. Right. Large deposit of grey granulations in this lung, especially in the upper and posterior part. A small cavity found in the apex.

Some grey granulations were seen scattered through the left lung.

Some tubercle in the pleura and peritoneum, covering the liver; none in the liver substance.

There was a perforation of the bladder, leading into a cul-de-sac situated between the bladder and the rectum, and bounded above by the small intestines glued together.

Brain healthy.

The temperature in this case suffered very great daily changes. Thus, during the whole time it became normal in the morning, but rose every evening till May 18th to 103°. After this, the nightly elevation declined, and after June 1st the temperature was always normal.

CASE XIV.

Joshua Saunders, æt. 33. Admitted April 20th.

Has had a cough for sixteen months, and has lost flesh during the last twelve months. His voice has been hoarse for six months, and his cough worse for four months. His throat has been sore for the last six weeks.

On his admission he was very much emaciated. His tongue was furred; appetite middling; bowels regular. His cough was troublesome, and his expectoration abundant, and his voice weak.

There were evidences of very extensive consolidation at both apices, especially on the left side.

Submucous rhonchus was heard over the whole chest—front and back, and cavernous breathing under the left clavicle.

Whilst in the Hospital the physical signs increased. His appetite became bad; emaciation progressed rapidly; the expectoration was abundant. Latterly

he was attacked with paroxysms of dyspnœa, in one of which he died.

There was no albumen in his urine.

Post-mortem. Universal adhesion between the lungs and the chest walls. A large cavity was found in the apex, and several smaller ones in other parts of the left lung. The lung substance was crowded with grey and yellow tubercles.

The right lung presented similar appearances to those found in the left; the cavities, however, were smaller.

Heart healthy.

Spleen healthy.

Intestines healthy.

In this case the temperature rose every night to about 103°; that of the morning was seldom below 101°.

CASE XV.

Timothy Regan, æt. 10. Admitted on June 6th. He had been ill about three months.

This was a severe case of phthisis, but rather chronic in its course. He was very thin; sweated copiously; tongue generally rather furred. He suffered from occasional thirst. His appetite varied; generally, however, it was indifferent, and often very bad; he also complained of pain after food.

His bowels were regular throughout. Cough troublesome. Expectoration rather abundant; there was dyspnœa on exertion. On one or two occasions he complained of pain in his right side. At this time loud grating friction was heard on that side.

His urine constantly contained a very slight amount of albumen.

Weight. June 6th, 40 lb.; on June 8th, 10th, 13th, 17th, and 22nd, 39½ lb.; on July 4th, 37½ lb.

The physical signs showed very considerable consolidation of the left lung, very much less of the right. Loud cavernous breathing was heard at the right apex, and submucous rhonchus to the very base on the same side.

The physical signs increased somewhat during the patient's stay in the Hospital.

He was removed by his friends on July 9th.

The morning temperature during the early part of the time he was in the Hospital, varied between 100° and 101°: latterly, however, it fell, and varied between 97° and 98°. The evening temperature was throughout high, and varied between 102° and 103°.

CASE XVI.

John Foley, æt. 22. Admitted May 5th.

He had had cough for two years before his admission. For the last four months this has been worse;

he has lost a considerable amount of flesh, and has some hoarseness, and difficulty in swallowing.

The patient at the time of his admission was very ill. He suffered from much sweating, but middling appetite, vomiting, pain after food, diarrhœa during the seven days before his death, bad cough, abundant expectoration, hoarse voice, and rapid loss of weight. There was no albumen in his urine. He died on May 17th.

At the post-mortem:—

Both lungs contained much tubercle and some low pneumonia between the tubercle. At the apex of the right lung two small cavities were found.

His temperature in the morning varied between 99° and 100°; in the evening, between 103° and 104$\frac{3}{5}$°.

CASE XVII.

William Farr, æt. 30. Admitted June 9th, 1864.

When twenty-five years old he had measles, and since then has never been quite well. Two years and nine months before his admission he had a severe attack of hæmoptysis. Since the beginning of the winter of 1863 he has been much worse; has had some difficulty in swallowing for six weeks, and for the last three weeks his voice has been hoarse.

When admitted he was in a very advanced state of

phthisis. There was evidence of very considerable consolidation of a great part of both lungs. Numerous moist rhonchi were heard. His appetite was very bad, and he lost weight and strength rapidly. On June 15th numerous aphthæ were discovered on his tongue; these remained till his death. His voice was hoarse, and deglutition difficult. There was no redness of his throat. His bowels were regular throughout. The expectoration was abundant. Latterly he became slightly livid, and had several attacks of severe dyspnœa, in one of which he died on June 21st.

Post-mortem :—

There was much chronic thickening of the epiglottis, and some ulceration of the pharynx and less of the trachea.

Both lungs were riddled with cavities varying in size from an orange to a horse-bean; between these there were grey granulations and yellow tubercle.

Liver healthy.

Kidneys healthy.

Spleen healthy.

Ten ulcers were found in the small intestines.

Mesenteric glands contained tubercle in all its stages.

The temperature in this case suffered great daily variations, being normal in the morning, but rising every evening. The evening elevation became daily less whilst the patient was under observation. Thus at the time of his admission it was $102\frac{3}{5}°$, and on the evening before his death only $100\frac{1}{5}°$.

CASE XVIII.

Joseph Piper, æt. 30. Admitted May 27th, 1864.

For twelve months before his admission he had lost flesh.

This was a very severe and rapid case of phthisis.

His sleep was bad. He sweated greatly. His tongue was red and dry. Thirst great. Appetite very bad. Bowels regular, till within four days of his death, after which he had diarrhœa. He was delirious at night. His cough, however, was but slight, and his expectoration nil.

The urine throughout contained a very small amount of albumen.

The physical signs indicated great deposition at the right, but less at the left apex, with cavities at the right apex.

Post-mortem:—

There was found some tubercle at the left apex.

Very extensive deposition of tubercle throughout the right, with cavities at the apex of the upper and lower lobe. There was slight pneumonia besides the tubercle in this case.

Heart healthy.

Kidneys healthy.

Small intestines contained about four or five small ulcers.

CASE XIX.

John Jones, æt. 26.

This was a very rapid case of phthisis. On admission he was greatly exhausted, and suffered from profuse sweating, bad appetite, husky voice, and abundant expectoration.

There was evidence of much consolidation of both lungs, with small cavities at both apices.

There was no albumen in his urine.

He lost 3 lb. in weight between March 31st and April 19th.

His morning temperature was usually about 100°; that of the evening varied between 102° and 103° Fah.

CASE XX.

Caroline Dale, æt. 3. Admitted April 28th, 1864.

The present illness dates from last November, since which time the child has had a cough, and has lost flesh, especially so of late.

At the time of admission it was noted that she was very thin, tongue furred, appetite pretty good, bowels regular, cough bad.

The physical signs showed extensive consolidation of the upper half of the left lung, and slight of the extreme right apex.

Submucous rhonchus was heard at the right apex

and over the whole left lung; cavernous breath was well marked over the left apex, front and back.

Subsequently the physical signs increased rapidly and she also emaciated rather quickly, though her appetite was generally pretty good. On May 16th she was attacked with urgent dyspnœa; the child rapidly became prostrate and semi-unconscious. The left hand was rigidly flexed on the wrist; there was also rigidity of both legs. This, however, soon disappeared. After continuing thus some hours, she was attacked with convulsions, in which she died.

Post-mortem:—

The whole of the right upper lobe contained much tubercle, and a small cavity at the apex. Some tubercle was scattered through the lower lobe.

The upper lobe of the left lung was riddled with cavities; grey granulations were scattered through the rest of the lung.

Temperature. There were very great daily variations in the temperature, this falling in the morning always to the point normal to the body, and on several occasions much lower; thus on several days it fell to 94° and 95°. In the evening it always rose to 102°, 103°, or 104° Fah.

CASE XXI.

Ellen Sullivan, æt. 18. Admitted December 29th. Died February 9th.

This was a very severe case of phthisis.

At the post-mortem extensive depositions of tubercle with cavities were found in both lungs.

There was no albumen in the urine.

The morning temperature varied between 100° and 101°; that of the evening varied between 102° and 104° Fah.

CASE XXII.

Elizabeth Wells, æt. 8.

This was a case of acute general tuberculosis with very extensive deposit in the left lung.

The patient was under observation from June 12th to July 12th, on which day she died. During this time the temperature was generally normal in the morning, but always rose in the evening to some point between 103° and 104°.

CASE XXIII.

Kate Rush, æt. 21. Admitted May 1st, 1864.

Patient dates her illness from last November, since which time she has lost flesh.

At the time of her admission she was pale and rather thin. Her tongue was clean, appetite pretty

good, bowels regular. Her cough was rather troublesome; the expectoration, not abundant, was streaked with a little blood. The physical signs of the chest showed some consolidation of both apices. Submucous rhonchus was heard over the upper part of each lung.

The patient remained much the same. The physical signs somewhat increased.

She was made out-patient June 16th.

The temperature rose each night, on an average, to 102°. It fell in the morning to some point between 99° and 100°. It had undergone no improvement at the time of her discharge.

CASE XXIV.

Mary A. Cartwright, æt. 23. Admitted February 2nd. Died on March 9th.

This was a rapid case.

Both lungs contained very large quantities of tubercle and numerous cavities. There was some ulceration of the fauces and intestines. The other organs were healthy.

The temperature in the morning varied between 101° and 102°. In the evening it was usually 103° Fah.

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Vessels (50 Plates)	,,	1 5 0	2 0 0
Nerves (38 Plates)	,,	1 1 0	1 14 0
Viscera (32 Plates)	,,	0 17 0	1 10 0
Bones & Ligaments (30 Plates) . .	,,	0 17 0	1 0 0

LONDON : WALTON & MABERLY,
GOWER STREET, AND IVY LANE, PATERNOSTER ROW.