

TEMPERATURE IN ACUTE DISEASE

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Temperature in acute disease by Thomas Armetriding Compton

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THOMAS ARMETRIDING COMPTON

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PART I.—ON THE PRACTICAL VALUE OF ACCURATE DAILY OBSERVATIONS OF THE TEMPERATURE OF THE BODY IN ACUTE DISEASE.

In the following article I desire rather to assist, however slightly, in the more thorough investigation of a subject to which the attention of the profession has been lately directed, than to aim at any elaborate dissertation.

I propose, therefore, to bring forward, in a crude form, and as a simple independent testimony of certain facts, the results of my own experience, without reference to the statements of previous observers.

I cannot, however, here forbear mentioning how much we are indebted to Professor Wunderlich, of Leipsic, for his indefatigable labours with the clinical thermometer, nor can I altogether pass over without notice the admirable articles on this subject by Dr. Aitken and Dr. Sydney Ringer.

I shall not attempt to discuss the several theories of the production of animal heat, normal or abnormal, but will merely remark, that I have not, myself, found the actual excess of temperature, in typhus fever, to be proportional, as some assert, to the amount of urea excreted daily, and consequently am inclined to think that abnormal temperatures at any rate are not altogether due to tissue metamorphosis. My observations, however, on this matter, have not been sufficiently numerous to be of much value.

My object in taking up the study of temperatures has been mainly with a view to test their practical value for general use in

ordinary practice, and consequently my observations have (with some few exceptions) been taken only once daily, but always as near to the same hour as possible. It would, no doubt, have been more advantageous had several observations been taken during the day at stated hours; but if the value of thermometric registrations generally depends only on a frequent observation of the temperature during the day, a thermometer would necessarily be of little use in private practice. I have, therefore, preferred to register one observation only daily, viz., about 2 p.m., at the same time noting down the state of the pulse, skin, respirations, and general symptoms.*

The observations have been, without exception, made in the axilla, the superiority of this situation to that of any other being generally accepted, on account of the nearer approximation of its temperature to that of the blood in the vessels.

The general conclusions which I have come to, up to the present time, have been arrived at after a careful study of some 125 cases taken by myself during the last two years, at St. Bartholomew's Hospital, and also of some seventy-five other cases taken in the same hospital, during the same period, by Dr. Warter, a careful and accurate observer, to whom I am much indebted for the opportunity of using such valuable material.

I should here mention that during the past six months, the temperature of every case of acute disease, coming into the medical wards of the hospital, has been taken either by Dr. Warter or myself.

The total number of cases, then, in which the temperature and general symptoms have been watched and recorded daily throughout their course, amounts to 200, of which sixty are typhus, thirty typhoid, twenty pneumonia, fifteen scarlet fever, and the remaining seventy-five comprise cases of febricula, acute rheumatism, erysipelas, chorea, acute tuberculosis, &c. The total number of observations in these cases, and in others in which only one temperature has been recorded by Dr. Warter or myself, probably exceeds 5,000.

As I shall have to speak of normal and abnormal temperatures, it

* Generally we shall find that a registration at 2, p.m., is about the mean between one taken at 9, a.m. (when the temperature is nearly at its minimum) and one at 9, p.m. (when it is not far from its maximum). In the majority of acute diseases I think that the difference between these two extremes may for practical purposes be approximately placed at 2° Fah. Consequently, if we wish to compare the condition of a patient as to temperature with his state on a preceding day, we must be careful to take into account the hour of our visits.

will be necessary for me to state what I consider to be approximately the average normal temperature of an axilla in a healthy adult. A temperature of 98.4 Fah. is the point generally settled upon by the majority of authorities on the subject; but this, I believe, to be too high, as although I have not at present taken a sufficiently large number to decide the question to my own satisfaction (which I hope, however, shortly to be able to do), yet I can state that I have very rarely found such a temperature present in a healthy adult under normal conditions. I have every reason to think such a temperature to be nearly up to the maximum, consistent with health, and to be only met with occasionally, just as one comes across, now and then, a healthy adult with a temperature below 96° Fah. I consider the healthy range to be somewhere between 95°·5 and 98°·5 Fah., the most common temperature met with, being probably 97°·4 Fah., *i. e.*, one degree less than the temperature hitherto most generally received as the normal one.

The following then are the propositions I wish to establish:—

1st. That a continued daily temperature of 99° Fah., and upwards, indicates an unhealthy condition, and occurs in every case of acute disease. As I have never met with one case in which such a temperature was present, under normal conditions, in a healthy adult, and as every case of the 200 taken exhibits this state of temperature, the proposition may be considered to be proved.

2nd. That any one observation of a very high temperature (such as 105° Fah.), in any case in which the general symptoms do not appear of any particular severity, should lead to a very attentive re-examination, and suggest a very careful watching, especially if occurring in a non-diagnosed case; such a temperature being present only in severe forms of any disease.

In support of this I will mention the following case:—

W. B., aged twenty-nine, a well-nourished man, of rather sallow complexion, somewhat excited manner, having an occasional spasmodic way of speaking, complained, on admission, of sore throat, and on examination, both tonsils and the back of the pharynx, were seen to be considerably inflamed. He gave an imperfect history of having been ill about a week. This, at first sight, seemed to be merely a somewhat severe case of tonsillitis, and no further very minute examination, by the physician in charge, appeared to be immediately necessary. The case was therefore left for the history, &c., to be made out by the clinical clerk, before the visit next day, as is usual in such cases. Finding, however, the man's temperature

to be $105^{\circ}4$ Fah., I was interested in the case; and I made out, on further examination, the existence of partial trismus, and that the tongue, when protruded, deviated slightly towards the right side. Having mentioned this state of things to the physician, he returned again on purpose to see the case, when he found the symptoms still more severe, and considered the prognosis very unfavourable.

This man, moreover, died on the next day, some twelve hours after admission, the case being one of septicæmia.

Another equally important case of cerebro-spinal meningitis, in a girl of eighteen, was thought by many who saw it on admission, to be one of hysteria; but here a temperature of $103^{\circ}5$ Fah. was quite sufficient to negative such an idea.

This case also terminated fatally.

3rd. That the thermometer is of great use, as a means of diagnosis in those cases, which frequently present themselves, of general *malaise*, often accompanied by a history of rigors, loss of sleep, &c.; such symptoms being due either to the commencement of some acute disease, or merely to some gastric or uterine disturbance of a temporary character.

In these cases it is often at first impossible to decide, judging only from the pulse and general symptoms; but if the state of the patient be due to the more serious cause, we shall invariably find an abnormal temperature; and on the other hand if due to any other, a normal temperature, will be often met with, frequently accompanied by a very rapid pulse. I have never met with one case in which, the temperature being normal, any acute disease afterwards developed itself, and although I have nearly twenty examples of this proposition, I will only bring forward one.

E. J., aged twenty-four, a nurse in a ward in which there were several cases of typhus and typhoid fevers, is a well nourished and generally healthy woman. The cheeks are flushed, conjunctivæ slightly suffused, tongue covered with thin fur, and inclined to dry; the bowels have been loose the last three days, and were open five times yesterday. She complains of frontal headache, pains in all her limbs, want of sleep, loss of appetite, &c. Has not felt quite well for about a week, but continued at her work until yesterday. She "felt very cold all over" three days ago, and sat over the fire, but could not get warm. Her pulse is 72; temperature, 97° Fah. The next day, and the day after, she exhibited much the same symptoms; her pulse, however, going up to 120 and 100 on the two days respectively, whilst the temperature remained steady

between 96° and 97° Fah. Two days afterwards she was quite convalescent, and about the ward again. This case bore as strong a resemblance to that of an early stage of typhoid fever as it was possible to do, and for the first few days many considered it to be one of this disease.

A point of great interest in connexion with this case was the fact that some three months afterwards the patient had well marked typhus fever, with a temperature of 103° Fah., and a pulse of 120 on the fifth day, which was the first time I had an opportunity of seeing her on this occasion.

4th. That the temperature in every disease has a tendency to run a peculiar course, and has a certain range of altitude, a knowledge of which course and range is of great value as an assistance to us in diagnosis and prognosis.

In connexion with this proposition I should observe that I have not found the temperature in acute disease to be perceptibly affected by the season of the year at which the disease may have occurred, although the temperature of the wards during the year has varied to a considerable extent.

Again, if cases of similar severity at different ages be compared, the altitude attained by the temperature in any disease does not appear to be influenced by the age of the patient, although "the normal" is generally reached somewhat earlier in children than adults.

I have drawn up some charts to show the course of temperature as observed by myself in typhus, typhoid, and scarlet fevers, pneumonia, acute rheumatism, erysipelas, and tonsillitis.

These diagrams are not founded on any average, but merely represent actual typical cases. I have preferred to adopt this plan on account of the fallacies likely to exist in such tables if drawn up from averages. Errors in establishing the exact day of the disease are, in many cases, unavoidable; but these, although only to the extent of a single day, might considerably affect the ultimate result in any general average.—(For Diagrams see pp. 23-31.)

Having discussed typhus and typhoid at some length in another paper I shall not further allude to them. To the other diseases (the course of temperature in which I have endeavoured to illustrate by diagrams) I will briefly refer.

In pneumonia we have high temperatures as early as the second day, with the maximum generally on the third or fourth, and a sudden fall (of perhaps 5° Fah.) to normal on the seventh or eighth.—(See Diagram I.)

If this fall does not take place before the tenth day, we may be tolerably certain that the case is not one of simple pure pneumonia, but that it is probably complicated with tuberculosis, or connected with typhoid fever, rheumatism, &c.

In acute rheumatism we have a long-continued slightly abnormal temperature, generally ranging between 99° and 102° Fah., and very rarely reaching 103° Fah.—(See Diagram II.)

Erysipelas is characterized by very sudden changes of temperature; thus, we often get an alteration of 4° or 5° Fah. in twenty-four hours, and occasionally a fall of 7° or 8° Fah. in the same period. I have observed in several cases that a considerable fall has taken place immediately on the appearance of the characteristic redness.—(See Diagram III.)

The temperature of tonsillitis is especially interesting when compared with that of scarlet fever; and as the diagnosis in the early stage between the two is often doubtful, we may frequently be much assisted by the observation of the temperature.—(See Diagrams IV. and V.)

In tonsillitis the temperature in the middle of the day, when at its maximum, which is generally attained about the fourth day, rarely exceeds $100^{\circ}5$ Fah.; and this occurs with a pulse often below 100. Normal is reached about the sixth or seventh days.

In scarlet fever, on the other hand, the maximum is arrived at about the third day, when the temperature is generally 104° Fah., whilst the pulse is considerably above 100. The normal is not usually attained until the tenth or twelfth days.

Generally a high temperature, such as 102° Fah., when met with on the second day of *malaise*, will be found to denote a case of scarlet fever, febricula, or pneumonia.

Although I have taken a few cases of many other diseases besides those just mentioned, yet I have preferred, at the present time, to confine myself to the examination of the course of temperature in these seven only, considering that my experience of this subject in any other disease has not at present been sufficient for me to judge fairly of it. I would, however, just allude to the possibility of temperature being of great assistance to us as a means of diagnosis between typhus fever with severe cerebral disturbance (when occurring without any rash), and purely cerebral cases of meningitis or cerebritis. I have only had an opportunity of taking the temperature of two purely cerebral cases, but in both of these the temperature rarely exceeded 101° Fah., whereas with similar

symptoms due to typhus fever, we might have expected the thermometer to stand some 3° higher.

I should also state that the highest temperature I have ever taken was 107°·2 Fah., and occurred in a case of pneumonia following tracheotomy; the next highest was 106°·2 Fah., in erysipelas; generally, however, temperatures above 105° Fah. have been rarely met with.

I will conclude this part of the subject by bringing forward a case to prove the value of a knowledge of the course and range of temperature in different diseases.

A boy of fifteen was admitted with general *malaise* and sore throat. His tonsils and the back of his pharynx were somewhat inflamed, but his tongue was moist and nearly clean.

After the first few days he complained of nothing except weakness, although his voice continued very husky. His appetite remained pretty good throughout, and he slept well. About the fifteenth day he had some bronchitis, and on the sixteenth some hemorrhage, with a loose motion; previously his bowels had been somewhat confined. The hemorrhage did not recur. There was never any rash or abdominal tenderness, and the physician in charge of the ward considered the patient's illness to be due to the apparent symptoms manifested, viz., the sore throat, with probably some laryngeal mischief, and the thoracic complication.

The course of temperature was that of typhoid fever throughout; and at the time I mentioned this fact to several who were interested in the case, but I little expected to be afforded any corroboration of my statement, as the lad's temperature fell to normal on the twenty-eighth day; and two days after this he was up and about the ward.

However, as the case was not considered to have been one of typhoid fever, there was no especial necessity to be careful with his diet, and he was placed on meat diet. Having a very hearty appetite he did good justice to the food allowed him, besides partaking of some extras which were surreptitiously conveyed to him by his friends. The consequence was, to use his own expression, he went to bed "feeling very well," but "very full." Some hours afterwards symptoms of colic came on, which, not being relieved by the appropriate measures adopted, were followed by those of peritonitis of which the lad died on the seventh day from his seizure.

The *post mortem* disclosed a quantity of purulent fluid in the peritoneum, and numerous ulcers of Peyer's glands, the majority of which had already cicatrized, but in many the healing process