TABLE XXVI.—*J. W., aged 14. Pneumonia.*

Date.	9 A.M.	5 P.M.	9 P.M.
April 10	—	105.0	103.7
" 11	101.7	102.0	102.8
" 12	104.0	104.0	102.0
" 13	100.5	103.0*	104.0
" 14	99.0	—	98.6
" 15	98.0	98.6	98.6
" 16	99.0	98.6	99.0

* Same temperature at 1 P.M.

In injuries and diseases of the nervous system, very high temperatures have been recorded. I have referred to Brodie's and Teale's cases. But, in speaking of nervous diseases, I have never found, in my own experience, that life has been maintained when a temperature such as would be probably fatal in other diseases has been reached. Table No. XXVII shows the temperature of a man who was the subject of cerebral hæmorrhage, and also of a slight fracture of the internal table of the skull. He was admitted into the Infirmary under my care with apoplectic symptoms. For several days, the temperature was low; but, during the last three days of life, it rose considerably, and reached, shortly before death, 107.4 deg.

TABLE XXVII.—*Cerebral Hæmorrhage.*

Date.	Morning.	Evening.
November 11	98.6	98.6
" 12	99.0	98.6
" 13	100.0	98.0
" 14	98.6	98.6
" 15	99.0	99.0
" 16	98.6	99.0
" 17	98.6	99.0
" 18	99.0	99.0
" 19	98.6	99.0
" 20	98.6	99.0
" 21	100.0	103.0
" 22	103.0	103.5
" 23	105.0	106.0

Shortly before death, 107.4

Table No. XXVIII shows the temperature-ranges in a case of delirium tremens complicated with pneumonia. The first rise indicates the pneumonic fever from which the patient convalesced, but the delirium continued; and, before death, there was a decided rise in temperature, reaching 107.4 deg. shortly before dissolution.

TABLE XXVIII.—*S. S., aged 32. Delirium Tremens, with Pneumonia.*

Date.	Morning.	Evening.
November 7	—	98.6
" 8	99.0	—
" 9	100.8	99.7
" 10	104.0	101.0
" 11	101.0	100.4
" 12	100.0	100.0
" 13	99.0	100.7
" 14	99.6	100.0
" 15	99.0	100.0
" 16	99.0	100.0
" 17	99.0	101.0
" 18	—	101.0
" 19	99.0	100.0
" 20	99.2	—
" 21	102.4	104.5
" 22	107.4	—

It would be very interesting, if time permitted, to consider the causes of increased temperature in pyrexia; but, perhaps, in the present uncertainty of our knowledge, it would not be very profitable. Although increased heat constitutes one of the most prominent symptoms of fever, it is assuredly only one of its factors, or one of its results; and yet it is impossible to shut our eyes to the great importance of carefully attending to it as an indication for treatment. When we see, in cases of septicæmia, of acute rheumatism, of typhoid fever, etc., the temperature rising to 107, 108, 109, or 110 deg.; and when, apparently as the direct result of this increased heat, we witness the gravest disturbances of the functions of the nervous centres, and dissolution threatened; and when, under the influence of external cold, we see the temperature rapidly fall, the coma disappear, the delirium subside, and the patient restored to a condition of comparative comfort and real safety, it is impossible not to come to the conclusion that this high temperature, whatever may be its essential nature, has been, in these cases, a main cause of the alarming symptoms which were present. Were the coma or the de-

lirium due in either case to the poisoned or altered condition of the blood, the mere reduction of heat would scarcely afford the marked relief which we witness. Were the phenomena the result of some impression on the nervous centres produced by organic change, however slight, it is difficult to understand how this lowering of temperature could give rise to the rapid and striking alterations which are sometimes seen; and thus, I think, in our present state of knowledge, we must admit that temperature plays an important part in the phenomena of the pyrexial state; and, in studying the therapeutics of fever, we may well give a large share of our attention to those measures which have the effect of diminishing heat. This part of the subject is one on which I cannot enter now, although I hope on some future occasion to lay the results of my observations before the Society, and to speak of my experience on the use of cold applied externally, of quinine, of alcohol, of digitalis, of aconite, of salicylic acid, and of free nutrition as temperature-depressors in various forms of fever.

In estimating the rise and fall of temperature in disease, it is obvious that we cannot trust to our unaided senses; and that, in the thermometer, we possess a guide which, if properly used, can scarcely deceive us. The rapid rises of temperature which sometimes occur can only be recognised and appreciated by the application of this instrument of precision; and it cannot be doubted that it has in many cases rendered most valuable service, and been the means of saving life by pointing out the necessity for prompt and decided action.

THE BACTERIC ORIGIN OF TUBERCULOSIS, AND ITS ANTISEPTIC TREATMENT.

By I. BURNEY YEO, M.D., F.R.C.P.,

Physician to King's College Hospital, and Assistant-Physician to the Brompton Consumption Hospital.

I HAVE now before me a private letter from Dr. Max Schüller of Griefswald, and a copy of a short article by him, on the Treatment of Tuberculosis, extracted from the *Berliner Klinische Wochenschrift*. They both refer to a question of so much interest and importance, that they merit something more than a passing notice.

The substance of Dr. Max Schüller's letter is as follows. Some months ago, he published a paper describing experiments he had made on tuberculous or scrofulous rabbits, in order to study the effects of a treatment based on the theory of the bacteric origin of this disease, or rather of the artificial disease in his animals. These animals were infected by the throat with tuberculous matters, and so made tuberculous. Then he derived from the tubercular matters a small form of round bacterium or coccus by a process of Professor Klebs of Prague, which he names "*fractionirte Cultus*"; and with these he made the same experiments, and with the same results—viz., tuberculosis of the internal organs and a tuberculous inflammation of an injured knee-joint. He was thus convinced that tuberculosis in his animals was a disease caused by living elements or special organisms (*Monas tuberculös* of Klebs). He then tried certain drugs which he believed would have an inimical effect on the said organisms, and he found that, of the similarly infected animals, those that were not treated all died, in variable times; while those submitted to treatment not only remained alive, but recovered their health and increased in weight. He thought the results of his experiments justified him in appealing to medical practitioners to give a trial to what might prove a causally indicated treatment for a disease hitherto without any remedy. Professor Rokitsky of Innsbruck was one of the first to accept this invitation to make observations on man, and he is stated to have obtained good results. Dr. Max Schüller regrets that the newspapers should have published paragraphs with such sensational titles as "No more Tuberculosis": and he believes that the application of this mode of treatment to human subjects is attended with many more difficulties than in the case of animals, and that it requires to be continued for several months.

The drug he especially recommends is the benzoate of soda: this is inhaled in solution (2 to 5 per cent.) in distilled water, and by means of a spray-producer. For a man of average weight (sixty *kilogrammes*), the daily dose is from thirty to sixty *grammes*. If the stronger inhalation be not well borne, the drug can be given internally for several months, five to ten times a day, in *gramme* doses, in milk, and then weaker inhalations may be used. He considers it most important that the inhalations should be persisted in as often and as regularly as possible, through weeks and perhaps months; and the patient must "*devote his life to his cure*".

As, in order to give the smaller daily dose, viz., thirty *grammes*, it would be necessary for the patient to inhale the spray of twenty ounces of a five per cent. solution in the twenty-four hours, an ordinary

Siegle's spray-producer would prove quite inadequate, and it would be necessary to employ one of those used for surgical antiseptic dressings.

In private practice, two to four times a day will be often enough for the inhalations of the spray, and such inhalations should be prolonged for half-an-hour. The patient should, at first, be recommended to make as little effort as possible in inhaling, and only by degrees should he be allowed to make deeper inhalations. A period of rest should follow each inhalation.

Benzoate of soda (as obtained from Messrs. Bell and Co., Oxford Street), is a white granular powder, with a faint odour of benzoin, and a sweetish not unpleasant taste. It is freely soluble in water. It is sold at one shilling and sixpence the ounce, and therefore is not very expensive, as has been stated.

The above is a condensed account of Dr. Max Schüller's recommendations and directions. I shall shortly call attention to some of my own observations.

ON SOME CASES OF ABNORMALLY HIGH TEMPERATURE.*

By HORATIO DONKIN, M.B.Oxon.,

Senior Assistant-Physician to the Westminster Hospital; Physician to the East London Hospital for Children.

CASES of high temperature have been from time to time reported with more or less detail, involving contradictions to the generally received opinions as to the amount of heating the human body can undergo without dangerous symptoms or death. These have not had much weight, chiefly, perhaps, from being without an amount of evidence sufficient to outweigh their alleged *à priori* unlikelihood, and from a neglect of full precautions to exclude imposture, which has been known to play some part in the production of cases of this kind.

We are at present taught that the danger to life becomes great when the thermometer placed (with due care) on skin or mucous membrane registers over 106 deg.; and that a few degrees higher than this are incompatible with life, if not quickly reduced. The cases I am now about to quote seem to some extent to contradict this teaching; and, if genuine, to establish, first, that temperatures as high as 111 deg. Fahr. and even several degrees higher, may occur without any concomitant symptoms of danger, and often without any discoverable organic disease confessedly sufficient to account for the rise; but, secondly, that the high temperatures are probably of a very short duration.

The second of these statements, though it may appear at first sight to lessen the difficulty of believing in these cases of high temperature ending in recovery, really raises a greater difficulty; for how is the fact of rapid cooling through nine or ten degrees in a few minutes to be accounted for, in the present state of physical or physiological knowledge?

I shall relate the chief points of several cases which seem to bear upon this subject, giving shortly the evidence for the genuineness of the facts alleged. It will be rather my object here to call attention to the possible occurrence of these cases, and incite to further observation of them, than to theorise on their explanation; for, if the facts be true, their importance is obvious.

CASE I.—The first case I shall quote is that of a nurse, aged 19, at the East London Hospital for Children. At the end of an attack of enteric fever in January 1878, her temperature rose one afternoon to 105 deg., and in the evening, at 8.30, to 109.4 deg. She was put into a bath at 90 deg., with orders for the water to be gradually cooled to 60 deg. After ten minutes of the bath, a thermometer in the mouth showed 97.6 deg. After this date, all enteric symptoms soon disappeared; but for several months there were remarkable fluctuations of temperature, of which the following will serve as examples.

1. On January 25th, 1878, the temperature at midnight was 110 deg., taken twice (with no appreciable interval of time between the observations) with the same thermometer. Very soon afterwards, 109 deg. was registered by another thermometer. Again, the first thermometer being used, the temperature was found to be 108.4 deg. Shortly afterwards, a third thermometer in the mouth showed 108 deg.; and again the same at 12.30, only 98 deg. The first two thermometers, again used in the axilla, now showed 99.2 deg. From this time till 1 A.M., the temperature, taken in the mouth, axilla, and rectum, remained about 99 deg. The pulse was 92. The skin was not very hot to the touch, as I was informed. No observations were made as to respiration. I would

note here, however, that when, on subsequent occasions, which, from the apparent evanescence of the high temperature, were very rare, actual observation was made of the skin and respirations, the number of the latter was considerably raised; and the skin, at least once, was found to be very hot to the touch.

2. Several temperatures between 107 and 110 deg. having occurred between the end of January and February 19th, and there being reason to believe that they lasted but a very short time, from the fact of it being very rare to get two successive high registrations, I had a registering thermometer strapped in the axilla, and noted every twenty-four hours. This was done every day till March 2nd. On each removal, the index showed a temperature of over 108 deg.; the highest being 111.6, 110.5, 110, and four times 109 deg. During this period, two temperatures of over 108 deg. and two of over 107 deg. were taken in the mouth, noted at the time.

The patient was removed on March 2nd to the Westminster Hospital, for further observation. During nearly a month there, the temperature behaved in the same way; the maximum thermometer showing registrations from 108 to 111 deg.; and the temperature, taken in the ordinary way in the mouth and axilla, being often over 105 deg., and sometimes as high as 108 and 109 deg. On one occasion (March 23rd, at 6 P.M.), the house-physician registered 107.2 deg. in the right axilla; the maximum thermometer, which had been in the left axilla for half an hour, showing 107.8 deg. Five minutes afterwards, the temperature in the mouth was 98.8 deg., and in the right axilla 98.6 deg. This observation shows (a) that the high temperature was not local—to one axilla, for instance; and (b) that the temperature apparently fell in five minutes through nearly nine degrees. At the time of this high temperature, the pulse was 102, the respirations 32, and the skin was very hot to the touch. With the temperature-fall, the respirations sank to 24.

It is to be remarked especially, with reference to this case, that the high temperatures were generally unaccompanied by any discoverable constitutional symptom other than a feeling of "flushing", or "rushes of heat", described by the patient. No organic disease has been discovered in the patient, after repeated and careful examination by many observers, with the exception of uterine retroflexion and displacement of the left ovary. She was more or less anæmic throughout, and suffered from amenorrhœa. She complained frequently of considerable pain in the left side of the abdomen, probably in the ovarian region; and was always, and is still, short of breath.

I have published this case at length in the *Lancet* of May 11th, 1878, and of March 15th, 1879; to which reports I must refer those who are interested in the subject. But, before leaving it, I must give some account of the precautions taken to establish the alleged facts, in view of their abnormality and apparent inexplicability.

1. Several trustworthy observers registered the high temperatures.

2. Several thermometers were used: a fact which renders the objection of the inaccuracy of the instrument untenable.

3. From an early period of the case, I treated the patient as an impostor, though there was never any reason for suspecting her; and her great anxiety to be considered, as she felt, well, would render it likely that any imposture would have been in the opposite direction. Feeling, however, that no personal factor should enter into a scientific investigation, I caused, on several occasions, strict precautions to be taken to detect imposture; such as manipulation of the thermometer, or changing it for another, etc., or the concealment of some heated substance in the bed. *E. g.*,

a. Four temperatures between 107.4 and 108.6 deg. were taken in the mouth, the patient being persistently watched.

b. A temperature of 106 deg. was observed by myself on March 2nd, 1878, the axilla having been previously examined, and the patient's hands being in view during the whole time.

c. A temperature of 108.4 deg. was taken in the axilla on March 13th by the House-Physician at the Westminster Hospital, who kept in view the patient's hands.

d. A temperature of 105.2 deg. was taken in the axilla when the patient was under the influence of chloroform (for a vaginal examination).

e. On February 21st, temperatures of 106 and 105.9 deg. respectively were shown by a registering and non-registering thermometer, held simultaneously in the mouth.

f. On one occasion, the thermometer kept in the axilla to register the maximum temperature, which appeared to be so evanescent, was covered with strapping, and the patient's arm was strapped firmly to her side. Seals were, moreover, placed on the strapping, rendering it apparently impossible for the instrument to be reached without detection. On removal of the strapping, the thermometer registered 109.6 deg.

For these reasons, I infer that the temperature of 111.6 deg., the

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association in Cork, August 1879.