IT is not too much to say that the successful treatment of phthisis depends on the reading and interpretation of the temperature chart. The knowledge gained by the use of the stethoscope is interesting to the physician, and may be to the patient, but to treat a case without a thermometer would be a mere groping in the dark.

It is essential then, to get the correct temperature, viz., the internal temperature, or as near to it as may be. The axilla temperature is, of course, useless. That of the mouth is most unreliable, unless taken with great precaution, and retaining the thermometer in the mouth, and under the tongue, for at least ten minutes; this may seem an absurdly long time, but I have found in my own practical experience that the mercury continues to rise often after five minutes, and no lower limit than ten minutes can be fixed, and even then the temperature obtained is not reliable. This will not, I think, appear so unreasonable,
when we consider the great changes of temperature to which the mouth is liable. Only on awakening in the morning (especially if one sleeps with the mouth shut) does its temperature approach that of the interior of the body. At other times, after being out of doors and keeping the mouth open (as occurs while talking), especially on a cold day, the mouth temperature will bear no ratio whatever to the internal temperature; and ten minutes cannot be considered too long an interval to permit of its regaining its proper ratio. Again, the mouth temperature may err in the opposite direction, and bear too high a ratio; as occurs after taking a hot drink, after mastication, &c.

It may be seen then, that the mouth temperature is very unreliable, and this method should never be employed if it is at all possible to employ the rectal method. The objection to this latter method is on aesthetic grounds, and perhaps these objections are natural; but I think that if the physician recognises the great importance of accurate records of temperature, he will find means to overcome these objections.

Before going further, I should like to refer to a popular expression, so common in this country, "normal temperature." We speak of it as if it were a hard and fast line drawn between health and disease; a rule for all, and for each separate individual. It is scarcely necessary to say that this is not the case. For, in the first place, what is the so-called "normal" temperature of one may differ to the extent of several decimal points from that of another. Again, to fix an arbitrary point, as the normal temperature throughout the day, is absurd; for apart from disease, the temperature during the day varies under many influences, the most important, of course, being bodily exertion of any form. Mental excitement, too, will raise the temperature. So also, will sitting in the sun, &c., &c. The temperature of a healthy man, taken immediately on awakening in the morning, will be found to be far below "normal"—a degree Fahrenheit or more. If it is again taken after he has dressed and breakfasted, it will be found to have gone up to his usual day temperature. Now let him go for a long walk, and take his temperature immediately on his return, it will then be found to have risen to, say 1° F., above the former reading. Now let him sit down and keep quiet for
half an hour, he will then find that his temperature has gone back to its usual height. In females, menstruation is the cause of a very erratic temperature, and as these variations occur a day or two before any discharge has begun to make its appearance, the physician must be on his guard, and try to obtain timely warning of their approach.

In Switzerland the Foehn wind (which is, I understand, identical with the Sirocco of Malta, and the Mistral of Southern France), will cause the temperature to stand somewhat higher than usual.

Having now cleared the ground, I can discuss the value of temperature-taking in phthisis.

It would be incorrect to say that the temperature was the physician's guide, for it is his autocrat, and definitely lays down its laws, that such may be permitted and such not. For instance, any considerable rise of temperature forbids the patient leaving his bed, a lesser rise forbids him leaving his room and long chair. As regards the amount of exercise (walking) permissible, the temperature taken on return at once decides the question and pronounces whether the walk has been an excessive strain, or no, and if it is safe to extend its length next day. In general, as long as the temperature keeps up we cannot hope that the disease has been yet arrested, but when it has come down and remains so, we can hope it is in process of becoming so. What is very important is, that the temperature often gives timely warning (perhaps some days) of a recrudescence of the disease, or of some small foci breaking down, &c., &c., and this rise of temperature (at first very slight, may be) occurs, though no other physical signs may be apparent; this warning is very valuable, for by taking precautions beforehand, such as keeping the patient at rest, &c., much may be done to minimise the severity of the attack, and haemorrhages are often thus prevented.

The following temperature chart is that of a fairly typical case, doing well, it will be seen to include a slight rise of temperature lasting for a few days, such as very often occurs.

The black line is the rectal temperature, the dotted line that of the mouth (the thermometer being left in situ for five and ten minutes respectively. The readings were taken on awakening, at about 7 a.m., at 12 noon, immediately on the return from a
walk of some five miles, and at 6 p.m., after an afternoon spent as one pleased, including a short stroll.

As regards the rectal temperature, I would draw attention to (1) the low morning temperature; (2) to the high midday temperature, taken immediately after the walk (which, however, falls on resting to its usual mark); (3) at 6 p.m. the temperature shown corresponds to the "so-called 'normal' temperature," being taken after an afternoon spent without any prolonged exertion. These readings are fairly constant, and are "normal" for this particular mode of life, but for another individual, or for another mode of life, they would not be so. As regards the mouth temperature, it may be seen how it varies and has no fixed ratio, except the early morning one, which is one decimal point below the rectal; the reason for which must be, that at that time only does the temperature of the mouth approximate that of the interior of the body. The temperature after a walk is most irregular, although ten minutes were allowed in each case and every precaution was taken.

From my own experience, I have come to regard the early morning temperature as the most important, as this is the most unlikely one to be affected by outside influences, and in my own person I have found this reading to be the surest indicator of my own sensations.

Another method of taking temperature is employed by Dr. Huggard, of Davos. While making water he holds the thermometer longitudinally in the stream of urine. This is, I think, an excellent method to employ in the morning, when the
bladder is full, but at other times I think it is not so reliable. It possesses the advantage of being a very quick method.

**Disinfection.**

It may be taken that for all practical purposes a phthisical patient disseminates infection by his sputum, and by that means alone; patients, then, should always carry with them a pocket flask, and expectorate into it alone. The flasks should at bedtime be collected by a nurse, emptied and disinfected thoroughly. I would suggest that the flask be immersed for a considerable period, say overnight, in a 1 in 20 solution of carbolic acid, which is the best germicide for the tubercle bacillus. The sputum, before final disposal, should be allowed to remain for an hour or so, in equal parts of a similar solution. Such precautionary measures would naturally suggest themselves to all; however, they are not as a rule observed, even in our best sanatoria, a fact which I confess somewhat astonishes me. Spitting cups for night, used in the patients' bed-rooms, should be treated on similar lines. Dettweiller's flask is a very good and useful pattern of pocket flask, simple, and fairly easily cleaned.

Doctors and nurses, more especially if they handle sputum, should take every possible precaution; a mere perfunctory dip in carbolic lotion is of little practical good. A nail-brush should be always employed. One hears it often stated that nurses never contract the disease; like most popular statements, however, this is not, unfortunately, borne out by facts.

Bed-rooms of patients should be periodically disinfected, and no one should be put into a bed-room previously slept in by a consumptive without its being carefully disinfected. For this purpose spraying with chloride of lime (1 per cent. solution) is probably the best, surest and easiest method, all the surfaces of the room being carefully gone over. This is the method usually adopted in France. In Switzerland, formalin vapour is used. In our own country, strange though it may seem, no precautions whatever are adopted. I consider that this state of affairs should not be allowed to continue.

**Measures Calculated to Prevent the Spread of the Disease.**

Phthisical mothers should not suckle their infants. As regards infection from the ingestion of the meat and milk of
infected animals, such has been definitely proved to be the case as regards rodents. We have therefore inferred from this and from other hypotheses that infection can also occur in the case of man. However, as regards diseased animals, it is mainly the lymphatics and serous membranes that suffer, the fat and flesh being but rarely affected, comparatively speaking; a very common form is where the pleura is affected, which affection is commonly known as angle-berries, or grapes, on account of the arrangement of the nodular masses. When the meat of the animals so affected is exposed for sale the pleura is generally "stripped."

The two sources of danger of eating tubercular meat, as pointed out by the Royal Commission on Tuberculosis, are (1) that no cooking can destroy the bacilli imbedded in the interior of a joint unless it be a very small one, and (2) the danger arising from the knife of the butcher carrying infection from infected parts to those parts exposed for sale. This latter is not, however, a very real danger, as the infection in this case being on the outside, would in all probability be destroyed in process of cooking.

To guard against these dangers one measure is urgently required, and that is the abolition of private slaughter houses. All slaughter houses should be under Government control, and have an inspector, whose duty it would be to reject as unfit for human food any animal extensively affected with tubercle, more especially if wasted. Any animal with a "stripped" pleura should be rejected out of hand.

As regards milk, we, in this country, are agreed that before use it should be sterilised. However, there is considerable difference of opinion as regards the temperature to which it should be raised before it can be considered as innocuous. This is probably due to the fact that the tubercle bacilli contained in milk are extremely virulent, much more so than the bacilli elsewhere. This fact has apparently been overlooked by some investigators, and they have conducted their experiments, with regard to the thermal death point of tubercle bacilli in milk, or sterile milk to which bacilli have been added. Their results, therefore, are of little value. As their thermal death point, $65^\circ$ C. and $70^\circ$ C. for twenty minutes have been given, but it is very doubtful if this is sufficiently high. On the whole, for
domestic purposes it is safest to bring the milk just up to the point of ebullition. Pasteur kettles, with their outside jacket containing steam, are also efficient, if properly used.

On this whole subject of human susceptibility to bovine tuberculosis Professor Koch has joined issue. He has experimented with young cattle, and found that he could not infect them with human tuberculosis. He then infers that the converse is true, viz., that bovines cannot infect man. But surely, at best this is only an inference, and as such cannot be accepted without proof; especially as all \textit{à priori} proof seems to lie in the opposite direction. However, all statements made by him must be treated with the very gravest respect, and a Royal Commission is now sitting to enquire into the subject.

Koch has just lately brought forward a mass of statistics in support of his statement, and at the same time accuses us of inconsistence. He asks, why all this bother about milk, seeing that we do nothing as regards butter and cheese? Well, to start with, two wrongs cannot make one right, and again, these two substances do not form a constituent of an infant’s food at that early age when it is so susceptible to abdominal phthisis. I confess I do not exactly see how we would proceed to disinfect butter and cheese, short of altogether discarding them as articles of food, a course which I for one would be very loth to do.

\textbf{Cleanliness.}

Absolute cleanliness should be enforced in the rooms inhabited by a phthisical patient. They should be daily cleaned out systematically. Although every precaution be taken by the patient, particles of sputum are liable to escape him, especially on coughing. These particles will eventually dry and become incorporated with the dust of the room, and will be quiescent until disturbed either by the wind or by mechanical means; when they will rise and float in the air, and thus become a source of danger to all who inhale them. Therefore, no dust must be allowed to accumulate, but must be got rid of daily by means of wet mops and dusters, to which the particles of dust will adhere. Brooms must on no account be used; in fact, they should never be used in any inhabited dwelling.

The number of germs in any internal atmosphere is sur-
prisingly small, but let the dust be raised, as by stamping on
the floor, &c., and their number will be found to have increased
a thousand-fold.

In the bed-room of a sufferer there should be as little
furniture as possible, the surfaces of which are, of course,
receptacles for dust. No carpets should be allowed, or at most
a little strip alongside of the bed. There should be no heavy
curtains; if any, they should be light and of a material easily
washed. All necessary furniture should be light, so as to be
easily movable, and raised from the floor, so as to permit of
cleaning both underneath and behind. High wardrobes are an
abomination, or any other high article of furniture, on account
of the difficulty of getting at their upper surfaces. Cupboards
contained in the interior of the wall itself are most excellent
contrivances.

The floors should be closely fitting, with no cracks between
the boards, failing this, linoleum is a good substitute. The
walls should be either limewashed, or papered with waterproof
paper, so as to permit of their being washed down at intervals.

As regards personal cleanliness, the patient should be enjoined
to wash his face and hands frequently, but the subject of baths
brings in a serious difficulty. Important though it be to keep
the surface of the body clean, with all its pores open, so as to
enable it to perform successfully its functions, still the danger
of allowing a daily bath to every patient must not be over-
looked. The exertion of taking a bath, and the subsequent
drying, is much greater than one would imagine; besides, the
raising of the arms above the head and violently using them,
as one does in drying one’s head and back, may occasion grave
risk.

If a healthy man took his pulse both before and after his
morning tub the acceleration would, I think, surprise him. A
bath, then, cannot be always permitted a patient, and permission
must always be first granted and precautions adopted. For
instance, a patient may be allowed to bathe but not to dry
himself, using instead a bath-towel dressing gown, which is an
excellent substitute. Others must be content with a sponge
down by a nurse, she herself drying the patient. A cold bath
must be under no circumstances indulged in, more especially
on account of the resulting increase of blood pressure. Dinner
napkins and handkerchiefs, if used, should be steeped in 1 in 20 carbolic lotion before being sent to the laundry.

CLOTHING.

This is a point on which there is not much to say, except to repeat the old motto, "Wear flannel next your skin." Heavy overcoats should not be worn when walking, on account of the extra "work done" in carrying them. Waterproofs should not be allowed. In many sanatoria no head-dress is worn; why, I do not know, and I can only account for it by the well known fact that a reformer to be successful must also be a bit of a fanatic. This would also account for many extravagances which are (or were) committed at sanatoria. Bed clothing should be as light as is consistent with comfort, and no non-porous covering should be employed.

MODE OF LIFE.

The correct life for a consumptive to lead has been well compared to that of a vegetable, and, I would add, to that of a highly manured and cared for vegetable. Both are given a superabundance of food and carefully guarded against any agency which may affect their material well-being. All the "force," all the "potential energy" of a patient should be expended on his bodily requirements, none should be "lost" on the brain. Therefore it is most important that a patient's mind be kept at rest and that he should have no worry or anxiety, and carefully excluded from anything likely to excite him, and the more nearly this life can be approached, ceteris paribus, the better will be the results. That this life can be more nearly attained in a sanatorium, than at home, is apparent. Visits from friends should be discountenanced. It is well known how they upset a patient, break into the routine, and the occurrence of more serious mischief, such as hæmorrhage, is by no means uncommon. Following on this, anything which is likely to excite the patient is "defence"; and so all games must be prohibited. Light literature only should be read, and letter-writing should be limited as much as possible. These rules refer only to serious cases, but with convalescents they need not be so rigorously enforced.

I can imagine one who has read of a patient's life at a sanatorium saying, "God help the consumptive," but if he
will contrast his present lot with that of, say, half a dozen years ago, when the patient's diagnosis spelt practically his death sentence, then I think he will alter his ejaculation to "God has helped the consumptive." That the life is "bad" at first, I grant; however, though difficult to believe, it is an undoubted fact that this life becomes quite liveable, and even negatively enjoyable, even for a man of active pursuits. And not the least of its pleasures lies in the feeling that day by day one is gaining ground and beginning to feel more like one's old self again. With this comes the feeling that it is, after all, worth living; that it is good to be alive, just for the sake of being alive. One learns, too, to revel in a glorious day, and for no other reason than just because it is a glorious day. "Mais il faut que nous revenions à nos moutons."

**MEDICINES.**

The modern treatment of phthisis is not a lucrative one for the druggist, and drugs are conspicuous only by their absence. The limits of this essay do not include the medicinal treatment of the disease, so I shall only name the drugs in common use.

Morphia is the sheet anchor in case of hæmorrhage, given at frequent intervals and with no sparing hand. Its *rationale* is to decrease the rate and depth of the respirations, lower the blood pressure and keep the patient quiet. As regards the other "internal hæmostats," such as ergot, gallic acid, &c., &c., their efficacy is very doubtful.

Heroin, an extract of morphia, is certainly a very useful drug in many cases, it being a depressant of the respiratory system, both local and central.

Hæmorrhages must also be treated with derivatives, and a combination of Epsom salts and Glauber's salts is as good as any. Some such gentle aperient as say, Apenta water, should always be kept readily available. In addition, an attempt should always be made to "abort" an incipient cold, and means for this end should be at hand.

**ADVANTAGES OF GOING TO A SANATORIUM.**

I had intended to go into this matter fully under a separate heading, but I have found it impossible to keep it apart from
my other remarks, and so I have already exhausted the subject; so it is only necessary to recapitulate.

First, I again repeat that I cannot too strongly urge on every case taking out a course, as it were, at a sanatorium. I consider this to be all important. There, and there only, can be learnt the hard lesson of what may be done and what must be left undone. So far and no farther. Here only can all the details of the proper life to lead be learnt, and it is on these details that success or failure depends. When all these details have been mastered, then the patient, if unwilling to remain longer, can with a fair amount of safety return home and treat himself, under medical supervision. I must admit, however, that on one point our sanatoria leave much to be desired, and that is as regards their feeding. That in this essential part of the treatment they should fail seems well nigh incredible, still such, however, is the case, and I can only account for it by thinking that the commercial element is allowed undue predominance. The fees charged are high; £5 5s. a week, so I think one might fairly claim to have the very best cuisine.

In the choice of a sanatorium I would give the choice to one built on the side of a hill, if sufficiently sheltered, for reasons already stated. I should also prefer one sufficiently remote from easy lines of communications, so as to render it at least difficult for relatives and friends to visit the patient; why, I have already discussed. Sanatoria on the sea-board I would not recommend, more especially if on the south coast.

Other points to consider are sanitation, comfort obtainable, and medical superintendence; this latter a very important point, as it is necessary for the physician to possess the complete confidence of his patient.