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Contributors

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THE SCIENTIFIC ASPECT

OF

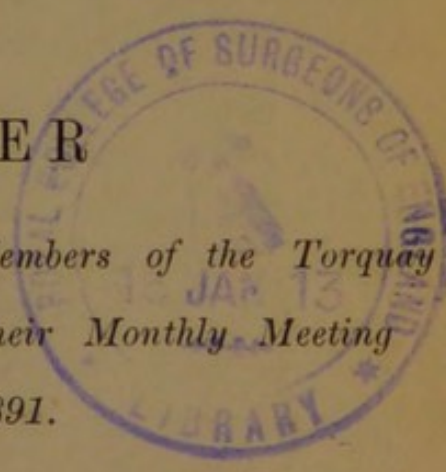
DR. KOCH'S REMEDY.

BY

WILLIAM ODELL, F.R.C.S. ENG., &C.

A PAPER

*Read, by request, before the Members of the Torquay
Natural History Society, at their Monthly Meeting
in April, 1891.*



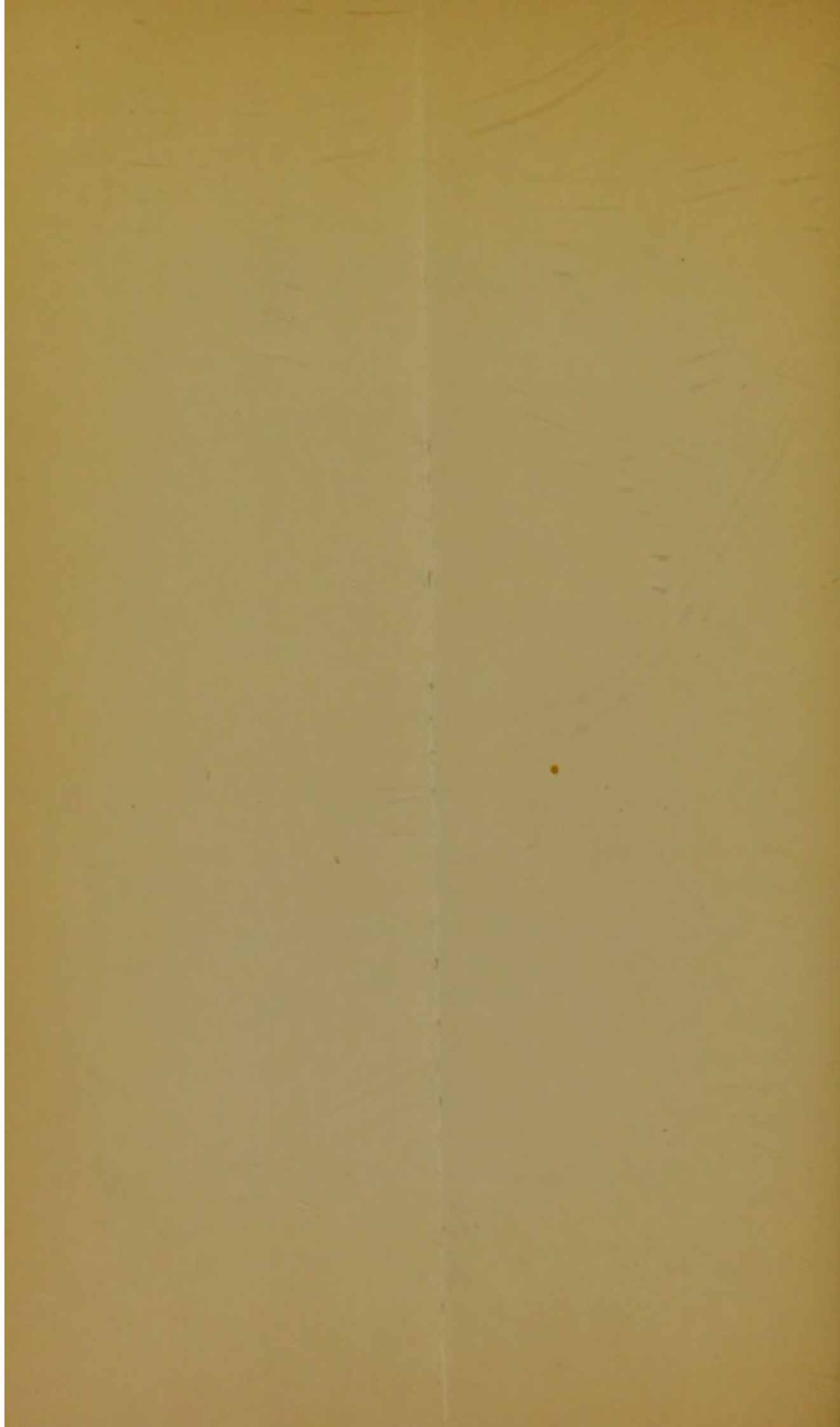
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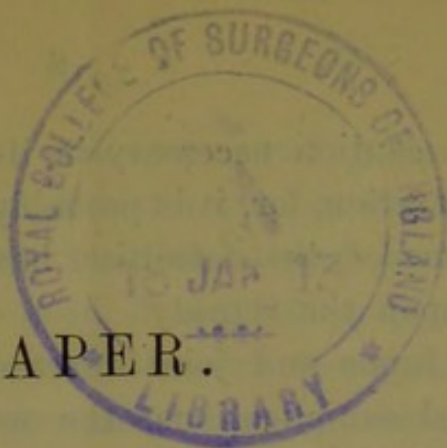
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PAPER.

AFTER describing the "Germ Theory," and speaking in the highest terms of the value of the scientific investigations of Sir Joseph Lister and M. Pasteur, the lecturer said:—

“In 1877 Robert Koch published a memoir, in which he fully described the life history of the anthrax, or splenic fever bacillus, and gave a complete demonstration of the life history of this micro-organism and the definite proofs of its pathogenic properties”; and, in 1882, he similarly described the tubercle bacillus.

In his summary of Therapeutics, Dr. Walter G. Smith says, "The year 1890 will ever be memorable for the announcement of Koch's method of treatment for tuberculosis." And surely this is the case, for, never in the history of medical science, has there been such anxiety and deep-felt interest displayed about any new remedy as was manifested, and still continues to be shewn, with reference to the so-called "Tuberculin." The exact composition of the fluid is probably known only to Professor Koch and his immediate assistants; but we know from his own statement that it is a product of the artificial cultivation of the tubercle bacillus; and it possesses most active properties.

The method of diluting the tuberculin was given in the *British Medical Journal* of January 10th, and the great powerfulness of the remedy renders the most

extreme caution necessary in its dilution and subsequent administration, for, it is probably due to this want of care, that some of the fatalities have occurred, bringing discredit upon the remedy.

For lupus and joint affections, without pulmonary or laryngeal complications, the usual dose for commencement is 0.01 cubic centimetre, or a centigramme; whereas, for phthisis and tuberculous laryngitis, the dose is at the most 0.001 c.c., or a milligramme, but this is now considered too large a dose, and 0.0001 c.c., or a decimilligramme is often used.

I myself have always begun with 0.0005 c.c., or half a milligramme, for phthisis, and 0.005, or half a centigramme, for lupus and joint affections, and have increased the dose as the patient has been able to bear it; but the constitution of each patient must be studied, and the intervals between the injections, and the dose, regulated thereby. It was supposed that Koch's lymph acted almost entirely by causing necrosis of the tuberculous tissue, which is thrown off bodily; but, many of the most remarkable cases of improvement have been where the local reaction has been almost absent, and there has been no necrosis or perceptible exudation of lymph. The most likely theory is, that the remedy causes tubercular deposits to disappear by stimulating the giant cells and lymphocytes to increased activity, and thus acts upon living tuberculous tissue alone, without affecting dead tuberculous tissue at all; and this will explain the fact that in advanced cases of phthisis the remedy has little or no effect, for, when the vitality of the tissue has become exhausted, it is no longer possible to stimulate their elements to renewed attacks on the invading bacilli. It would appear then that the lymph, when inoculated, stimulates the defensive cells of tubercular tissue to

resist the tubercle bacillus, and by preventing the further formation of the tubercular toxins, tends to stop the night sweats, and to improve the general condition. "The practical point is, that as good, if not better, results will be obtained by the administration of the smaller and safer, than with the comparatively larger doses which have led to disastrous results; and that, in tuberculosis, as in enteric (typhoid) fever and other like affections, it is better to help the patient to kill his own germs than to attempt their destruction by intestinal antiseptics, antiseptic inhalations, hot air, cold air, and a hundred and one other things equally useless and often harmful."

The bacillus tuberculosis occurs in rods 2-4 μ ., occasionally 8 μ . long, very thin and rounded at the ends. They are straight, or curved, and frequently beaded, and occur singly, in pairs, or in bundles. They are found in the cells of tubercles, especially in the interior of giant cells; they are non-motile. The bacilli are found in all tubercular growths of man, monkeys, cattle, birds, and many other animals; and in cases of artificial tuberculosis, in rabbits, guinea pigs, cats, &c.

In man the bacillus can be detected in the tissues, in the sputum, in the blood, and in the urine. Tuberculosis may also be produced by inhalation and by food. The channels of infection in man are most probably the pulmonary or intestinal mucous membranes; the bacilli or their spores are inhaled from the air or taken in with the food, and they cannot thrive outside the body in cold climates; and, in last week's *British Medical Journal*, Mr. Watson Cheyne quotes several instances in which the tuberculosis infection was produced through wounds of the skin. Typically identical bacilli have been observed, but very sparsely, in sections of lupus. The bacilli appear to be the direct cause of tuberculosis, and the presence of the

bacillus in the sputum of patients is regarded as a distinctive sign of this disease, and its detection has, consequently, become a test which is daily applied by physicians in forming clinical diagnosis. There are numerous processes for staining the bacillus tuberculosis, viz., Neelsen's, Koch's, Ehrlich's, Rindfleisch's, Weigert-Ehrlich, Orth's modification of Ehrlich, Gibbs', Baumgarten's, &c., &c., but the one I myself have adopted was recommended by Dr. Leu of the Charité, Berlin, and is a modification of Ehrlich's, by which the process can be completed in about four minutes. It is a mixture of fuschine in carbolized water and alcohol, which, after drying, is treated with a solution of methylene blue, sulphuric acid, and water. The whole preparation is by this means stained light blue, leaving only the bacilli scattered about as minute red lines or rods.

It is a remarkable fact, that, at the time Professor Koch brought out his remedy for tuberculosis, a fluid of almost exactly the same composition, and having the same destructive properties, was in the bacteriological laboratory of Dr. Crookshank, to whose valuable work I am indebted for much of the information contained in this paper. Dr. Dixon, of Philadelphia, was also working at the same subject, and had made some original observations with reference to the bacillus of the ostrich; and, after lecturing to the students at the Academy of Natural Sciences, one day, he said he had just received a cablegram to the effect that Professor Koch, of Berlin, had found out a cure for tuberculosis, and he should at once start for Europe. I had the pleasure of meeting Dr. Dixon in Berlin, and of hearing him deny that he had ever claimed priority to Koch in his discovery, but that he himself had made investigations in the same line, which would tend to confirm the results of Koch's experiments.

The effect of the injection of "Tuberculin" upon a healthy human being is best described in the words of Dr. Koch himself:—"I have experienced in my own person the symptoms which arise after the injection of 0·25 cubic centimètre, 2½ centigrammes, having made an injection in the upper part of my arm. These symptoms were briefly as follows:—"Three or four hours after the injection I felt pains in the limbs, fatigue, inclination to cough, difficulty in breathing, all of which speedily increased; in the fifth hour, I was seized with an unusually violent fit of shivering, which lasted nearly an hour; at the same time, there was sickness, vomiting, and the temperature of the body rose to 39·6 C. = 103·3 F.; after about twelve hours all these symptoms gradually grew less, the temperature fell, and by the next day was again normal. The heaviness of the limbs, and the feeling of languor lasted a few days longer, and the spot where the injection had been made continued red and painful for the same length of time." For a healthy human being, the lowest limit of the effect of the remedy is about 0·01 cubic centimètre=1 centigramme. Various experiments have proved that the same holds good, too, with people suffering from any disease that is not tuberculous. But, it is a very different matter when the patient is tuberculous; if the same dose be injected, there ensues a strong general as well as local reaction. "This reaction usually consists in a feverish attack, beginning, as a rule, with a shivering fit; the temperature rises to 39°C.-102·2 F., sometimes to 40°C.-104 F., or even to 41°C., or 105·8 Fahrenheit; added to this, there are pains in the limbs, a tendency to cough, great exhaustion, and often sickness and vomiting. On several occasions, a slight icteric colour was noticed, and in some cases there also appeared an eruption like measles on the chest and neck. As a rule, the attack begins four or five hours after the

injection, and lasts from twelve to fifteen hours. In exceptional cases it begins later and passes off with less violence. The patients are very little affected by the attack, and as soon as it is over they feel comparatively well—as a rule, even better than they did before it.” The value of the remedy as an aid to diagnosis cannot be too highly estimated, and it is possible with this remedy to diagnose cases of commencing consumption, even after failing to determine with certainty the nature of the disease by the discovery of bacilli or elastic fibres in the sputum, or by a physical examination. I saw two remarkable instances of the diagnostic value of the remedy, in Berlin. The first was a child, under Dr. Speyer, at the Friedrichshain Hospital, whose board had been headed enteric fever—(typhoid), but the temperature kept up long after it is usual in this disease; so, at last, tubercular disease of the bowels was suspected, the patient was injected with “Tuberculin,” the characteristic reaction occurred, and the child got rapidly well. The other was in the Moabit Hospital, which is under the superintendence of Dr. Koch himself, and the case was that of a boy who was admitted for tuberculous disease of the hip with penetrating abscess. He was put under the new remedy, but, although there was the characteristic reaction, the temperature remained much higher than it should during the intervals, and yet there was apparently no physical condition to account for it. One day, however, Dr. Sarfert probed the wound, and came down upon some soft substance, which he removed, and found to be a plug of lint which had been carelessly left in by the surgeon in attendance before the boy was admitted into the hospital. After the removal of the foreign body, the boy’s temperature fell, and under Koch’s treatment he made a good recovery. Besides its value in the treatment of phthisis, lupus, and tuberculous

joints, the remedy is most useful in cases of surgical injury, in which there is the least scrofulous tendency on the part of the patient. In one case, in Dr. Bardeleben's wards, a man had had three ribs excised, and the wound would not heal, so at last Koch's remedy was injected, and the gaping wound put on a healing aspect and rapidly closed. This is not the place for me to enter upon medical details, or I could record cases innumerable which came under my notice during the month I spent in Berlin, in which the value of Koch's remedy was most assuredly manifest; but I was, and am still, firmly convinced that the remedy is capable of effecting all that Koch declared it was. I should, however, like to bear testimony to the kindness and courtesy which was extended to me by every one with whom I came in contact, and, although I literally *lived* in the wards and clinics from morning till night, and the crush of foreign doctors must have greatly harassed the Professors and their assistants, I never saw an unkind act, or heard an unkind word used to anyone.

Since my return, I have treated four cases of phthisis and one case of tuberculosis affection of the knee joint, and, I may truthfully say, all have done well; for, although one of my patients caught cold and got an attack of pneumonia, even she is progressing favourably, and none of the cases were in any way "picked,"—in fact, some were treated "under protest."

The official statement ordered by the German Government, has been spoken of as discouraging, but to my mind this is not the case, considering the shortness of time the patients had been under treatment, the severity of the winter through which we have passed, and the insanitary and overcrowded condition of some of the wards in the Berlin Hospitals. The report deals with cases treated from Sept. 12th and Oct. 11th, to the end of December, 1890.

In some few cases the report goes into the middle of January; roughly speaking, therefore, it extends over a period of ten weeks. There were 1,061 cases of tuberculosis of internal organs treated. Of this number 13 were *cured*, 171 *substantially improved*, 194 *improved*, 586 *unimproved*, 46 died. Now, it is only fair to presume that those cases which in ten weeks were *substantially improved*, have by this time gone to swell the number of *cures*, and that those who were improved have become *substantially improved*, and that, with the returning spring, many of those which were unimproved, have become better; but, even supposing half of them have died, the result then will be better than has happened in any hospital without Koch's remedy, and with every hygienic advantage. The same argument holds good with reference to the patients treated for external tuberculosis, the numbers of whom were 15 *cured*, 148 *substantially improved*, 237 *improved*, 298 *unimproved*, 9 *died*; except that it is not reasonable to expect any large increase in the number of deaths, as lupus and joint affections are not commonly fatal.

At the meeting of the Surgical Congress, in Berlin, last Wednesday, Professor Bergmann said, in reference to Dr. Koch's treatment, "The method was in its infancy, though it opened up a new path, the ends of which were as yet veiled even from the prophetic eye of science." Professor König, of Göttingen, who was very sceptical about Dr. Koch's remedy at first, said that "Notwithstanding all the failures he would not for the world be without the remedy, though years might elapse before definite results could be obtained. The main thing was extreme caution in application, and the avoidance of exaggerated expectations, since certain constitutions cannot stand tuberculin at all." He concluded by declaring that "the scientific importance of Dr. Koch's method, and the guarantee that better results

would be obtained in the future, lie in the unsurpassed effect of tuberculin on tubercular matter."

Within the last few days, I have received letters from the following places, with reference to the experience in treating patients by Koch's method:—

Oxford.—No strikingly good results. The most promising have been the lupus cases, but none of these are anything like cured, though benefitted.

Cambridge.—The few that I have selected have done on the whole decidedly well, but I find the people have been too much frightened by the Virchow's accounts in the daily press to undergo the treatment readily.

Bournemouth.—Twelve patients have been treated with Koch's lymph at the Sanatorium. All of them have improved in weight, and their physical signs have to a certain extent cleared up. As regards the treatment being a cure, the future alone can tell.

Plymouth Hospital.—Two cases of lupus improved, one might be called cured. One case of scrofulous ulceration of knee and neck improved after three months' treatment. One tuberculous knee—amputated after third injection. One strumous elbow improved. One tubercular kidney improved. No phthisis treated.

The North London Hospital for Consumption has sent one of its staff to Berlin to study Dr. Koch's system for the treatment of tuberculosis. Several of the hospital patients had, at their own request, been inoculated with Dr. Koch's lymph, and satisfactory results were reported; but the medical staff thought it too soon to express an opinion as to the permanency of the results.

Dr. Coghill, of the Ventnor Hospital for Consumption, says:—"I have been very satisfied with the results of my Koch treatment so far. I have in all 22 patients under the method. All have benefitted materially—some

remarkably so—more so than I have ever seen in anything like the same time. The improvement has been in proportion to the stage and extent of the disease, as Koch himself distinctly stated would be the result. I have had three very advanced cases. In the worst, whom I inoculated under protest, the effect was most striking and immediate, and although the effect cannot be permanent, it has certainly given a respite. I have had three London men examining my cases, and they are very much struck with my experience. I have not had a single moment's anxiety in connection with any of the cases. I find each patient must be treated separately according to their idiosyncracies. I bear in mind also that the inoculations are only part of the treatment of phthisis."

Mr. Lennox Browne, in writing respecting a patient of his whom I saw in Berlin, says:—"The result was most satisfactory, and that he is now in Egypt, having gained at the date of his arrival $6\frac{1}{2}$ lbs. in weight from the time he commenced treatment. It is quite certain, however, that the treatment calls for much more caution than we saw displayed in Berlin."

Dr. Dixon, Professor at the Academy of Natural Sciences, Philadelphia, says:—"The results attained here have been either negative or distinctly adverse, and I cannot help thinking that climatic influences have a good deal to do in helping forward or retarding the treatment. Torquay would seem to be a very favourable climate for tuberculosis patients."

This brings me to the last part of my paper, and I venture to think it is amongst the most important points for consideration in the cases of tuberculous affections, viz., climate. In his original monograph Professor Koch says:—"In several cases I have had a decided impression

that the nursing of the patients had a very considerable influence in the result of the treatment. For this reason, I strongly advocate the use of the remedy in proper institutions, where careful observations can be carried out, in preference to the treatment at home, or as an out-patient. It is impossible yet to decide how far the methods of treatment hitherto acknowledged (such as mountain climate, fresh air treatment, special diet, &c.) may advantageously be continued with the new treatment; but I believe that these therapeutic methods, when combined with the new treatment, will prove to be highly beneficial in many cases, particularly in neglected or very severe cases, as also in the convalescent stage."

Dr. Coghill laid particular stress upon the fact that the inoculations are only part of the treatment of phthisis; and his remarkable success, as well as my own, point to the fact that a suitable climate is, before all things, a necessity in the treatment of tuberculosis. With reference to my own cases, no other remedy but "Tuberculin" has been used so long as the patients were being injected, except in the case of the one who caught cold and had pneumonia, when, of course, it was necessary to resort to other medicine.

Now, I firmly believe with Dr. Coghill, that Koch's remedy, combined with the ordinary therapeutical treatment of phthisis, will accomplish hitherto unparalleled results provided the climate is suitable. What result could be expected from treating patients in the fog and smoke of London during a winter of such severity as that through which we have passed? I have not time to enter fully into the question, but will refer you to "The Climate of Torquay," by E. Vivian, Esq., M.A., F.M.S., to "Torquay as a Health Resort," and to the "Torquay Pictorial," for statistics as to sunshine, rain, temperature, &c., and make

only the following quotation from Mr. Vivian's pamphlet : " It is very certain that *practically* neither heat nor moisture are to be found in excess in Torquay ; and no invalid whom prejudice has allowed to remain during the summer, has found reason in the airy parts of the town to complain of heat, although this arises from no lack of sunshine." " Sunny Devon " is the epithet chosen by one to whom the *Quarterly* has given the palm amongst the poetesses of England, and whose long residence here gives value to her impressions."

If I am met with the statement—" What about last winter ? " I say at once, " It is the exception which gives force to the rule." Walk round Cockington, Babbacombe, Chapel Hill, or anywhere about Torquay, and you will see huge elms, which must have stood for hundreds of years, lying prostrate from the effects of the last gale, or blizzard, proving beyond doubt that nothing of the kind can have happened during the present century ; and this statement will be corroborated by every old man—and they are very numerous—whom you may meet in Torquay.

Finally, the water supply of Torquay is second only to that from Loch Katrine ; its system of drainage second to none in the world.

