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AN OPINION ON DR. KOCH'S TREATMENT OF TUBERCULOSIS.

SIR,—In presence of the very justifiable enthusiasm created by the wonderful statements and demonstrations of Dr. Koch, it seems as if one had nothing to do but to wait for results or surpass in extravagance the praises of those who are for the time being giving the invention their loud support. I hardly dare to presume that anything short of the most unqualified adhesion will be found justifiable at the present hour, and yet I cannot help thinking that to Koch himself such an outburst of feeling, uncontrolled by reason, must be not a small source of anxiety for the success of his method.

That he has come nearer the cure of consumption by means of a chemical substance than anybody has yet cannot be doubted, his own word is sufficient to prove it. There is also very little doubt that he has at last succeeded in isolating one or several of the chemical compounds resulting from the metabolism of the bacillus tuberculosis grown in certain media.

It must be remembered that for some years it has been admitted that to such compounds cultures of micro-organisms owe the property which they have in many cases of conferring partial or complete tolerance or immunity. Various plans have been devised to obtain these products (the chemical nature of which was practically unknown till quite lately) in a form suitable for inoculation. Some have used, not unsuccessfully, oxidation by exposure to air, others have used heat, others, instead of modifying the fully formed products, have modified their virulence or prevented their formation by addition of certain substances to the cultivation media. Of late several observers, enlightened by the work of Brieger on the alkaloids of putrefaction, have attempted to separate the products of the action of micro-organisms on nutrient media in various stages of formation.

In this way several poisonous albumoses have been found. It seems probable that Dr. Koch is using one or several of these albumoses and that he has succeeded in discovering a method of obtaining them of uniform strength and in large quantity.

In this country Mr. Hankin's work on an albumose produced by anthrax and on the immunity produced by it is well known to all.

Keeping all these things in mind it seems to me that Koch's discovery must be received with a certain amount of caution.

Nobody reading carefully his own words would for a moment be wild enough to lend him the thought that he has found yet the means of curing tuberculosis or even consumption. He repeatedly insists upon the facts :

1. That he cannot kill the bacillus that is the cause of the disease.
2. That he cannot remove the bacillus without removing with it the tissues in which it grows.
3. That he can remove these tissues only when they are in suitable situations.

There is no doubt that notwithstanding this extreme modesty in stating his case Dr. Koch gives us distinct hopes, not only of curing many states hitherto incurable or difficult to relieve, but also of ultimately bringing under our control many other lesions. The best criterion of what Dr. Koch himself thinks possible will be found in the theory which he has framed *pro tempore* in order to explain the action of his remedy.

He admits that the material which he injects in such small doses causes the death of all the tissues in which the bacillus tuberculosis is growing, that is, that the remedy kills the tissues wide of the disease, to use a surgical expression. But between killing and removing there is a great difference. What will become of those more or less extensive tracts of necrosed tissues situated deeply in various internal organs? They might be slowly removed by lymphatics, after undergoing fatty degeneration, when not very extensive and protected from the access of putrefactive organisms. But in parts exposed, such as the lungs, the alimentary canal, the urinary tracts, not only necrosis but gangrene might result. Either the old or the new theories must be wrong, or both. It is therefore to be hoped that the practice will be better than the theories.

The extraordinary reaction following the injection of the brown fluid indicates, however, that in this case we have to deal more with a reaction of active than of dying tissues. One can easily conceive how even the addition of a small trace of poison of the same nature as that generated by the bacillus would not only help to kill the invaded tissues but stimulate to greater reaction the neighbouring tissues. Whichever view is taken the question of dose remains a puzzling element. The effects of necrosis even in the absence of gangrene are certainly far from favourable to the patient.

In the course of the last few years I have tried to find cases in which the onset of tuberculosis could be easily traced. In the most striking ones I have found in one that after continuous pressure on the vagi a low form of pneumonia had developed, and that the sputa, which at first were free from bacilli, contained abundance of them for some time before death. The necropsy showed the lungs to be destroyed in patches, pneumonic but not tuberculous, in the ordinary sense. The bacilli had evidently grown in the necrosed products which had accumulated in various parts of the organ under the influence of the nervous lesion.

In another case, that of a drunkard, I found in various parts of the lungs extensive hæmorrhages, and in one of them, measuring about two inches in diameter, and which had undergone retrogressive changes, I discovered a large number of tubercle bacilli, whilst there was no evidence of tuberculosis elsewhere and no bacilli were found in other parts of the organ.

Both patients were elderly persons. In both cases there had therefore been some pretuberculous necrotic changes. These cases

will be published in full; they have already been shown more than a year ago to the St. George's Hunterian Society.

Dr. Koch's own restrictions, specially those concerning miliary tuberculosis (which of all the forms of tuberculosis is the one which corresponds most to those fevers which have been hitherto treated by vaccination) form the best warning against generalisations by anticipation.

I believe that even at the risk of being considered wanting in scientific enthusiasm, it is my duty to express a few of the ideas which have come forcibly to my mind on reading all the accounts of what is going on at the present time in Berlin. I feel sure from what we all know about Dr. Koch that he wishes us to receive his discoveries, not with scepticism, but with a reasonable and scientific spirit. Any other course will certainly lead to disappointment and perhaps to a reaction still more unwise than the present excitement.—I am, etc.,

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