

same germ, which can be recognized to the exclusion of all others by certain peculiarities in staining or in manner of growth must be abandoned.

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KOCH'S TREATMENT OF TUBERCULOSIS.

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Communicated from Berlin to the University of Toronto.

To-day's number of the *Deutsche Medicinische Wochenschrift* is memorable by containing the continuation of Koch's communication on a cure for tuberculosis. The substance of this article has no doubt been telegraphed already to the American papers, with the same detail as was that of the first article two months ago.

After premising that the experience of those who have tried the lymph confirms the statements made by him in regard to it, he describes

the observations which led to its discovery. He found that the local ulcer which characterises the point of inoculation in experimental tuberculosis followed a very different course in a healthy guinea-pig, inoculated for the first time, from that which it does in one already tuberculous. In the former, it does not heal; in the latter, it does; the tubercle bacilli not finding favorable conditions for propagating themselves. These unfavorable conditions—or, in other words, immunity—can also be produced in a healthy animal by the injection of cultures of dead tubercle bacilli. Such cultures, innocuous to a healthy animal, are, in the same quantities, *fatal* to a tuberculous one; while in very much reduced doses they lead to the destruction of tuberculous tissue, and to an eventual cure.

Thus was indicated the direction in which to work. The substance which exercises such a remarkable effect on tuberculous tissue was evidently one which could easily be separated from the dead bacilli. Experiments were made with extracts of pure cultures of the bacilli, treated with 40 to 50 per cent. glycerine, and the result was the now celebrated lymph.

From such extracts the active ingredient can be separated as a colorless dry substance, which is insoluble in absolute alcohol, is not destroyed at temperatures which destroy the toxalbumins, and diffuses easily through an organic membrane; but the use in practice of this concentrated substance has no advantage over that of the glycerin extract. The hypothesis formed by Koch as to the mode of action of the substance in question is essentially that indicated by Buchner, and cited in a previous letter.

It has the power of killing living protoplasm when sufficiently concentrated; the symptoms following injection in a healthy person result from this action—perhaps on the leucocytes; but the necrotising power has much more effect on tubercular tissue which is already half dead, and therefore leads to its complete death and to interference with the proper nutritive conditions of the bacilli if they remain shut up within the dead tissue. Thus indirectly the substance has also the power of affecting the bacilli, causing them to fall into heaps of coccus-like granules.

It is unnecessary to say that (with the exception of the use of glycerine to extract the cultures) all that Koch has disclosed was already