

and also where the disease was, so to speak, of spontaneous origin.

He made also experiments in which he inoculated animals with bacilli which he had cultivated in serum. The disease was produced in the same way as in his previous cases. It is not necessary to go further into the details of this paper, as you no doubt have all read it. One cannot read it without being convinced that if he has made no mistake in his manipulation, he has discovered the real cause of the disease. That he has made such a mistake is not likely, as he is a most careful and painstaking enquirer. He has spent eight years in the investigation of bacteria, the last two of which were entirely devoted to the pathology of tuberculosis.

Since the appearance of his paper in the *Berliner Klinische Wochenschrift*, the attention of pathologists throughout Germany has been directed to this subject. Baumgarten, of Königsberg, claims to have made the discovery before the publication of Koch's paper. He made a number of experiments which forced him to the conclusion that the disease was infectious, and that the real cause could be discovered. Not the least interesting are the experiments in which he infected animals with a number of fluids, as ordinary pus, fluid of sarcomata, and carcinomata, decomposed pus, old dried blood, &c., without in any case producing tuberculosis. Ehrlich has in his investigations instituted a method of staining much simpler than that of Koch, and quite as effective. Take a test tube half filled with distilled water, add to it aniline oil until there is a slight cloudiness, then filter. To the filtered solution add fuchsine, an aniline colour, until there is a slight cloudiness. Care must be taken not to add too much fuchsine, as the liquid will become clear again. In this way the colouring fluid is made. Now take some tubercular sputa, place a small drop on a cover glass, press another cover glass over it, so as to leave only a thin layer, and allow them to dry. When dry, pass them through a Bunsen flame, and place them with the sputa side downwards in the colouring fluid, and allow them to remain in a half an hour in a warm temperature. If the solution is cold, the glasses must be

allowed to remain much longer. Now take them out and pass them through a solution of nitric acid in proportion of ten to twenty-six, wash out with water, dry, and mount in Canada balsam. I am indebted to Dr. Councilman, of Baltimore, for the minute particulars under whose direction, in Prof. Chiari's laboratory, the reader of this report has several times made the experiment. The rationale of the process is as follows:—(1). The heating in Bunsen flame fixes the albumen on the glass, so that it is not removed by repeated washings. (2). After the staining, it is passed through a nitric acid solution, so as to decolorize the surrounding elements. The bacilli appear to retain the staining notwithstanding the strong acid. In this way one can almost always find bacilli in tubercular sputa, and they are never found in that of any other disease. As a means of diagnosis this may be a matter of great importance. There have been instances in which bacilli were found in the sputa of persons supposed to be suffering from typhoid fever, but when the *post-mortem* was made they were shown to have died of miliary tuberculosis. In our opinion, many cases have been put down as typhoid which have really been tubercular.

After describing the discovery of these germs, and the manner in which they appear to convey the disease, Koch goes on to explain the phenomena of tuberculosis according to this theory. That the disease appears so frequently in the lungs is readily explained, as the germs are easily taken in in respiration. These bacteria appear to be effective in producing the disease after long exposure. Koch succeeded in producing the disease by the inoculation of sputa four weeks' old. Patients are not easily affected when the epithelium is intact, but when erosions or congestions take place, the germs find a ready entrance into the body. In children the bowels are most frequently affected, on account of the contagious matter introduced with the food. It is difficult to explain the hereditary nature of the disease by means of this theory. It is quite possible that individuals born with a weak constitution, and possessing a tendency to low inflammation, and cheesy degeneration, should be very susceptible