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THE ETIOLOGY OF TYPHOID FEVER.

Dr. Victor C. Vaughan, of Ann Arbor, Michigan, in a paper read before American Medical Association, Section of Practice of Medicine, June 27, 1889, contributes much valuable information on the Eberth bacillus and the ptomaines of typhoid fever. The Eberth bacillus is so rarely absent from the stools of genuine typhoid fever where the examinations have been made by competent men that we are justified in accepting it as the true cause of typhoid fever. Pure cultures of this germ are to be found in every bacteriological laboratory. It grows rapidly in our artificial media, and its characteristics of growth are well known. Drs. Vaughan and Novy obtained from drinking-water from Iron Mountain, where there had been a severe epidemic of typhoid fever, a germ which they could not distinguish by microscopical appearance, reactions with staining reagents, and growth in gelatine tubes and on potatoes, from the Eberth bacillus.

They inoculated three dogs with this germ taken from a beefbroth culture, twenty days old. The germs were washed with sterilized water, then suspended in the same menstruum, and injected into the peritoneal cavity with all suitable precautions. The dogs were placed in a large cage with a fourth one as a control. Twenty-eight days after, one dog had died and the two others had grown thin and sick. Five days later a second dog died. Post-mortem examination on both revealed some of the lesions of typhoid fever; in one, perforation.

Dr. Vaughan has succeeded in isolating a ptomaine from typhoid stools. His process is as follows:—

The stools were received directly from the patient in a sterilized vessel. With a sterilized platinum needle flasks of meat-broth, previously sterilized, were inoculated with these stools. These flasks were then kept at a constant temperature of from 38° to 40° C. (100 4° to 104° F.) for varying periods of time, after which he attempted to isolate any ptomaines that might be present. Thus it will be seen that he worked with a mixed culture containing all germs present in the fæces, that he might ascertain whether or not the basic substance or substances formed in such culture would differ from the ptomaines of Eberth's bacillus.

The method of isolating the ptomaine was as follows:—

After the cultures on meat-broth had been kept in the incubator at the temperature of 38° to 40° C. (100.4° to 104° F.) for from ten to twenty days, they were filtered and rendered feebly acid with hydrochloric acid. At this time the cultures were invariably ammoniacal. The acidified filterate was then evaporated to dryness, or as nearly to dryness as could be done, on the water-bath. The residue was extracted with absolute alcohol, the extract precipitated with an alcoholic solution of mercuric chloride, saturated at the temperature of the water-bath, the precipitate was collected, washed with alcohol, suspended in distilled water, and decomposed with hydrogene sulphide. The mercuric sulphide was removed by filtration, the filtrate evaporated to dryness on the water bath, and this residue extracted with absolute alcohol, the extract precipitated with a solution of platinum chloride in absolute alcohol, the precipitate collected, washed with absolute alcohol, and dissolved in distilled water. The aqueous solution was concentrated on the water-bath until the platinum compounds began to crystallize out. This aqueous solution contained two or more platinum compounds; but so far he had given his attention to only one of them. This forms in rhombic prisms which are purified by repeated crystallization. For purposes of physiological experimentation, this platinum salt was decomposed with hydrogen sulphide, and the filtrate concentrated nearly to dryness on the water-bath, when