

last series of animals were used as controls to determine the limit of tolerance of the organism. It was found that when the animals which had received the typhoid poison through the stomach up to the limit of tolerance, were inoculated with even small doses of a virulent culture of *B. Typhi* they died in 8 to 24 hours, and presented neither meteorism, abdominal pain, nor intestinal lesions, while animals which had not been vaccinated died in about the same time, but with the intestines intensely congested and ecchymotic, lymphatic glands enlarged, and mucosa destroyed.

From these experiments it follows that when an organism receives doses of typhoid toxin within the limits of toleration, the intestinal tract acquires a local immunity. A subsequent injection with a virulent growth thus may produce death, largely through the nervous system, while the intestine remains normal.

Sanarelli also discovered the curious fact that subcutaneous injections of sterilized products of the putrid fermentation of beef-broth also conferred immunity upon the intestine, thus opening up the question whether ptomaines derived from abnormal conditions of the digestive tract in man may not have some bearing upon the question of the immunity of the intestinal tract.

This observer also noted the fact that in guinea-pigs suffering from typhoid, the colon bacilli in the intestine increased both in numbers and in virulence, killing out all the other germs, and is inclined to attribute some of the secondary processes in typhoid fever to the invasion of the body by these germs which have thus become pathogenic. An immunity of the organism to typhoid also proved to be an immunity against the action of the *B. Coli*. Klein's work, too, on the inhibitory action of certain germs, as the *Prodigiosus*, *Komma bacillus*, and putrefactive organisms, upon the typhoid bacillus is also very important in this connection.

Altogether Sanarelli's work is the most complete and suggestive one which has yet appeared, and we may reasonably hope for important developments along these lines.

We fear that this paper may appear to some too theoretical and visionary. It was not our intention, however, to lay down hard and fast principles, but rather to draw attention to lines of thought suggested by the newer pathology. Clearly our old views of the pathological processes in typhoid fever will have to be considerably modified, in fact almost replaced by a more adequate and elastic interpretation of clinical facts, and our conceptions, while at present losing definiteness, must acquire greater breadth until further research places the subject on a clearer basis.