

blood, and of so altering the constitution of that liquid as to produce death; then, the introduction into the blood of a man weighing sixty kilograms of five milligrams of the nitrate of silver would insure, if not the total effacement of this contagium, at all events the neutralization of its power to destroy life. The index finger here points out to us the direction which physiological experiment is likely to take in the future. In anticipation of the assaults of infectious organisms, the experimenter will try to introduce into the body substances which, though small in amount, shall so affect the blood and tissues as to render them unfit for the development of the contagium. And subsequent to the assault of the parasite he will seek to introduce substances which shall effectually stop its multiplication. There are the stronger grounds for the hope that in the case of infectious diseases generally such protective substances will be found.

KOCH'S LATEST RESEARCHES ON CHOLERA.

(FROM PHILADELPHIA MED. TIMES.) §

Koch has two great qualities as an investigator—unequalled *technique*, and powers of patient observation. His experience has been vast, and each piece of work which he has done has been remarkable in leaving but little to correct, either by himself or by subsequent observers. No writer on mycology is more reliable; not one has proved himself worthier of professional confidence.

Doubts have arisen in the minds of many concerning the cholera bacillus, on account of the observations of Lewis, and of Finkler and Prior; and upon these we are glad to have Koch's criticisms, which have just appeared in the *Deutsche medicinische Wochenschrift*.

Lewis (*Lancet*, September 20, 1884) states that a bacillus resembling that of cholera can be found in the mouth, but Koch shows, in a very few words, that this form has been known for some years, that it differs from the comma form of cholera in being longer, more slender, and not so blunt at the ends; and it further differs in this all-important particular, that it will not develop in the weak alkaline pepton-gelatine, in which alone the cholera bacillus can be cultivated.

His criticisms on the work of Finkler, and Prior, on cholera nostras, show how necessary it is for men to have a proper preliminary training before undertaking such investiga-

tions. From their own statements he easily proves that they could not possibly have obtained pure cultivations. They appear, also, to have been so far astray as to mistake the part of the bacillus which all observers regard as the spores. After considerable difficulty Koch obtained some of their culture material, and found it in four different microbes, of which one resembled slightly the comma-bacillus, but is larger and plumper, and in its mode of growth quite different, growing much more rapidly in gelatine or on potatoe, and showing unmistakable differences in the form assumed in the cultures. It is a totally distinct micro-organism, and very probably has no special connection with cholera nostras. The culture which Finkler and Prior made was from stools which were not quite fresh, but they had preparations from fresh stools which were believed to show the comma-bacillus, but those which Koch examined contained only the ordinary intestinal forms.

Three cases of undoubted cholera nostras have since been examined by Koch, and neither in the stools nor the intestines could comma-bacilli be found, nor did they develop in cultivations.

He remarks, in conclusion, that the experiments of Rietsch and Nicati, on the production of cholera in animals, have been successfully repeated in the Berlin Hygienic Laboratory. The material of a pure cultivation was so far diluted that the quantity injected did not contain more than the hundredth part of a drop. When placed in the duodenum the animals died in from one and a half to three days. The mucosa of the small intestine was reddened, the contents watery, and the comma-bacilli were found in extraordinary numbers. The condition was similar to that of the intestines of a recent human case. The exceedingly small amount injected precludes the possibility of an intoxication produced by the action of any poisonous product.

These latest observations of Koch afford additional strong confirmatory evidence of the correctness of his views concerning the etiology of cholera and its connection with the comma-bacillus.

IN AUSTRIA, during 1883, there were twenty thousand, three hundred and twenty-three twin births, three hundred and fifteen triplets, and one quadruple birth.