THE PASSAGE OF TUBERCLE BACILLI THROUGH THE NORMAL INTESTINAL WALL. A PRELIMINARY REPORT.

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In the discussion of the question concerning tuberculosis infection through food, some writers have placed great importance on the location of the oldest, or primary lesion, holding that this should be found along the digestive tract if this tube had served as the portal of entry. At first sight this would appear reasonable, but numerous experiments have demonstrated the fallacy of the claim.

In animals infected by feeding, I have repeatedly been struck by the extensive involvement of the lungs, when the intestines were either free of lesions, or only slightly affected. An explanation of these observations had to be sought for.

As early as 1890, Dobroklonski showed that in guinea pigs the tubercle bacillus could penetrate the intestinal wall in the absence of any demonstrable lesion, and after short contact.

In 1895 the late Professor Nocard made the interesting observation that blood drawn from horses under the strictest precautions would often show contamination if taken at certain periods of digestion, while at other times no such contamination would occur. In seeking an explanation of this, two of his students, Desoubry and Porcher, showed that in dogs during the digestion of fat large numbers of bacteria were carried through the intestinal wall and could be detected in the chyle by plate cultures. If the dogs were fed material free from fat very few, or even no bacteria were found in the chyle.

Quite recently, 1902, Nicolas and Descos have shown that tubercle bacilli will pass through the healthy intestine of dogs during digestion.

My own experiments on this point were done during the fall and winter of 1902.

Method. — Healthy dogs were selected and kept under observation for some time. A purge of castor oil was given, and the animal fasted for 24 hours afterward. A single dose of an emulsion made of equal parts of melted butter and warm water, containing a large number of tubercle bacilli, rubbed into a smooth paste, was then given by means of a stomach tube. Three and a half to four hours later the dog was
killed, and as much chyle as possible collected, together with the mesenteric glands. With this material guinea pigs were inoculated intraperitoneally. Microscopic examinations were made also. The entire intestine was then carefully examined after washing it out, and in two cases microscopic sections were made from several portions of the gut. In no instance could any lesion be detected.

Results. — The experiments were carried out on ten dogs, eight of which gave positive results. From these eight, 24 guinea pigs were inoculated. Of these 21 showed well marked tuberculosis, 1 was lost, and 2 remained well, showing no lesions whatever when chloroformed four months after inoculation. The microscopic diagnosis of the guinea pigs was in every instance confirmed by microscopic examination of sections. In only three cases could tubercle bacilli be demonstrated under the microscopic in the material from the dogs used for inoculation.

The two dogs which gave negative results were the first two experimented upon. The probable explanation of failure in them is that the culture of tubercle bacillus used was of human origin which had long been used for making tuberculin, and was known to be of low virulence. The culture used was of the 142 generation. After this a bovine culture was employed, the generations being the 29th to the 33d.

In the light of these experiments we are warranted in concluding that under certain conditions tubercle bacilli pass through the normal intestinal wall with great facility and rapidity. The most favorable condition for this to take place appears to be during the digestion of food made up largely of fat. When we remember that the chyle is carried directly into the blood stream through the thoracic duct, it is easy to understand how it is that infection through food may show itself first in the lungs, or at any rate that the lesion in the lung may be as old as the intestinal lesion.

The claim that a food tuberculosis should show itself in a primary intestinal lesion is fallacious and misleading.

4. Ibid.