

to produce numerous tubercular nodules in the peritoneal cavity of a calf. The animal, however, rapidly succumbed to pyæmic poisoning. Evidently the development of tuberculosis had been greatly favored by the lowered vitality dependent upon the double infection.

In 1893 the following experiments on cattle were carried out by Professor Sydney Martin.<sup>8</sup> Six calves were fed on tuberculous sputum; two of them received each 440 cc. of human sputum containing bacilli in large numbers. One of these after 56 days was killed and was found to be suffering from tuberculosis of the intestine and mesenteric glands; the second was allowed to live for 138 days; when killed it was found to be quite free from tuberculosis. The four other calves received, mixed with their food and in one meal, 30 cc. of human sputum containing numerous bacilli. They were killed at intervals of 33, 63, 85, and 283 days from the commencement of the experiment. The first was slightly tuberculous, the second and third had distinct tubercular nodules in the intestine, whilst the fourth remained free from the disease. In similar experiments carried out with tubercular material of bovine origin the disease came on much more rapidly, and was more extensive. In his report, Martin writes, "It is evident we are dealing in the case of tuberculous sputum with material which is less infectious to calves than bovine tuberculous material, since in those calves fed with human sputum, not only did two not become infected at all, but the others only developed a local lesion of the intestines and mesenteric glands, while in those fed with bovine tubercular material the disease has spread from the intestines and mesenteric glands to the lymphatic glands of the thorax and to the lungs."

In this country important experimental investigations have also been carried on. Frothingham in 1897,<sup>9</sup> reported that he had inoculated calves in the peritoneum, in the trachea, and subcutaneously, with emulsions of tubercle bacilli from human sources, with the result that local nodules were produced. The following year Theobald Smith<sup>10</sup> also reported that as the result of his investigations he found that the tubercle bacilli from bovine sources had in culture fairly constant and persistent peculiarities of growth and morphology, and might to some extent be differentiated from the bacilli of human origin. There was also a marked difference in their pathogenic power. In 1899, Adami,<sup>11</sup> in summing up the evidence, wrote: "Cattle, if treated identically, and given equal quantities of growths of tubercle bacilli emanating from man and from cattle respectively, react to the two cultures differently. In the former only a localized and thus non-infectious disease is produced; in the latter a generalized and consequently infectious disease develops."