

oculations of bovine bacilli. He concludes, that "among bovine tubercle bacilli there can also occur differences with regard to virulence." Koch and his followers are very active in making discoveries which have been known elsewhere for a long time.

TRANSMISSION FROM MAN TO ANIMALS. In spite of Koch's denial of all possibility of infecting animals with human tuberculous material, this has been done by numerous workers. The first of these was Chauveau, who, in 1868, succeeded in infecting young cattle by ingestion by intravenous inoculation, and by subcutaneous inoculation. Tuberculin had not at that time been discovered, but Chauveau foresaw the objection that might be raised, namely, that his experimental animals were infected with tuberculosis at the time the experiment began, and to avoid this selected them from the Jura mountains, where tuberculosis was unknown. Bollinger, in 1879, was the next to succeed in infecting cattle with the human bacillus. Other successful experimenters, Crookshank, Kitt, Sidney Martin, Thomassen, Nocard, DeJong, Arloing, Westenhoffer, Max Wolff, Schottelius, Febiger and Jensen, Hamilton and Young, and at the laboratory of the State Live Stock Sanitary Board of Pennsylvania we have succeeded a number of times in the same thing. I will only mention one of these experiments, that of Hamilton and Young, which has been recently published. In their work 19 calves were inoculated by different methods with human material, and of these 15 developed tuberculosis, while four resisted. The diagnoses in the cases of these animals was made by macroscopic as well as microscopic examination, and also by re-inoculation of guinea pigs from the tissues.

PATHOGENIC ACTION OF THE BOVINE TUBERCLE BACILLUS FOR MAN. Accidental inoculations in the laboratory and in post-mortem work on cattle have given us some opportunity of observing the effects of the bovine tubercle bacillus on man. I have reported four such cases, all of which resulted in the formation of typical lesions which required excision before healing took place. In two of these cases the bacillus was isolated and studied, excluding the possibility of infection from human sources. In one instance the recovered organism was compared with the original culture. A number of similar cases are on record, among which are those reported by Krause, Spronk and Hofnagle, Lassar, Tscherning, Pfeiffer, Hartzell, Kurt Muller, DeJong, Joseph and Trautman, and Troje. A common feature of all of them is their resistance to treatment, final cure resulting only after radical excision. In the case recently reported by Troje, which seems to be free from the objections usually raised, infection extended up the arm, and two years after the