

results of experiment are by no means uniform and not entirely satisfactory. The best results have been obtained where in addition to the toxins the substance of the germs has been employed as well, but even in this case there is some discrepancy between the different observers. In fact Maragliano is the only one who seems to be at all sanguine as to the value of his serum.

The few observations I have made have been carried out on slightly different lines from those hitherto published in the hope that they would throw some light on a somewhat doubtful question and possibly elicit some new facts. I have employed goats for the purpose, finding them on the whole the most suitable. It used to be thought that goats were absolutely refractory to tuberculosis, but this is certainly not the case. (Colin. *Compt. rend. Acad. de Sc., Paris*, 1891, CXIII, 219). It is true, however, that in a natural state they rarely suffer from the disease. It is possible to give them the disease by injecting living virulent bacilli in considerable quantities into the circulation, although subcutaneous injection will not suffice. They are therefore relatively immune. They are also hardy animals and stand the various manipulations well. A considerable quantity of serum can be obtained from them which is of good quality and keeps well. Goat serum has the further advantage, as Lépine has shown (*Sém. Méd.* 1891, XI, 21), that it produces much less hæmolysis when added to human blood than does dog's serum.

It is a well recognized fact that the sera of several normal animals possess what may be called natural antitoxic bodies. Thus horse serum possesses about two or three hundred antitoxic units against the diphtheria germ, and Maragliano states that human serum possesses three to four hundred antitoxic units against the bacillus tuberculosis. It was thought wise therefore to determine first whether normal goat serum could be in any sense considered protective against tuberculosis. Should this prove to be the case then one might try to increase this up to a valuable point.

For the purposes of the experiment it was obviously necessary to obtain the serum without contamination from bacteria and as nearly normal as possible. To attain this the following method was adopted. A large healthy male goat was taken, the hair was removed over the course of the external jugular vein in the neck and the skin washed and sterilized by means of a solution of sublimate (1-1000). A large sterilized trocar attached by a rubber tube to a sterilized bottle was then inserted into the vein and the blood allowed to flow into the vessel. The serum was allowed to separate in a cold chamber; the clear