

The activation of the epithelium is not uniform over the entire ovary, but it is rather localized in different areas. In some places, probably on account of a better blood supply and better nourishment, the epithelial cells, which are to be considered as resting ovogonia, begin to grow and their nuclei display some of the morphological changes that characterize the growth of spermatogonia into primary spermatocytes. In other places the epithelium may be found entirely inactive.

Mitotic figures can be seen in the epithelium but they are not as common as one might expect if every epithelial cell were to divide before giving rise to a primary ovocyte. It seems, therefore, that the ovogonia of the germinal epithelium may grow into an ovocyte without a previous mitotic division.

## 200 (2432)

**The appearance of specific antibodies in the serum of rabbits by intratracheal and intravenous injections of living tubercle bacilli.**

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The production of antibodies in animals (rabbits) by the intratracheal injection of bacterial antigens other than tubercle bacilli is considered as practically identical to the intravenous injection.

The importance of the introduction of antigens directly in the lungs has received a particular importance in relation to recent investigations concerning "autonomy of organs" (Besredka<sup>1</sup>) in infection and immunity. It is of interest to note Besredka's experiment in vaccination against diphtheria. A repeated intratracheal injection of killed diphtheria bacilli will protect a guinea pig against a subcutaneous injection of living Klebs Loeffler bacilli, while the control animal vaccinated subcutaneously will die from the same dose of the living bacilli.

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\* Introduced by S. B. Wolbach.

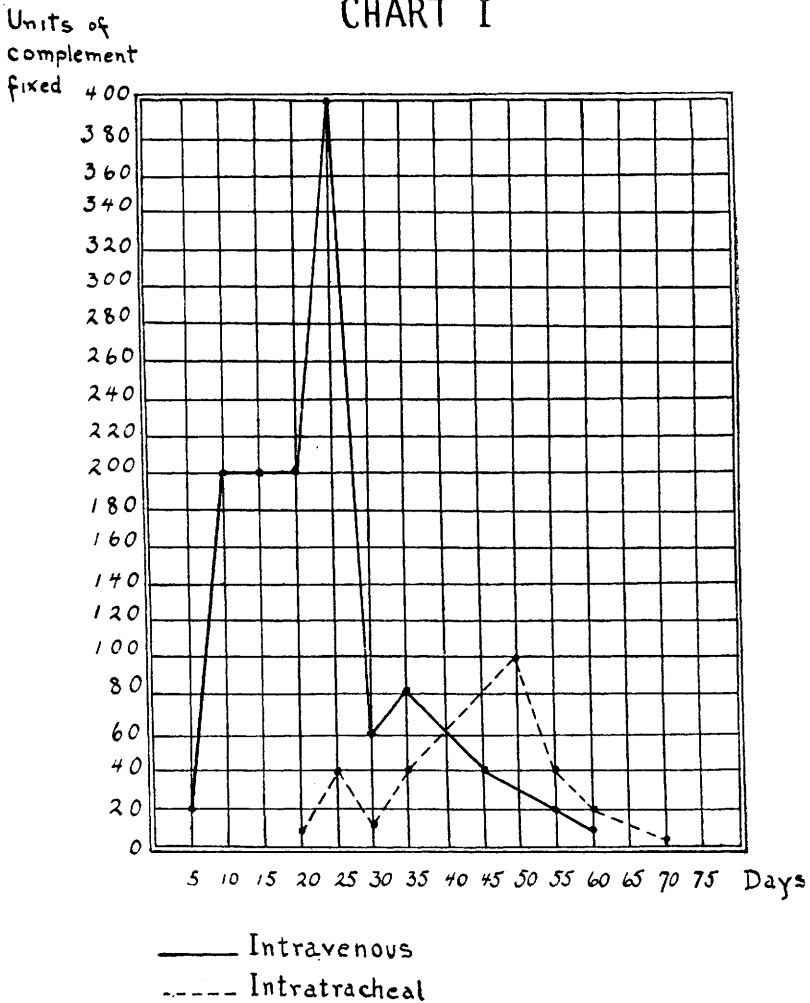
<sup>1</sup> Besredka, A., *Ann. de l' Institut Pasteur*, 1919, 1920, 1921.

Our experiment is a comparative study of the production of specific antibodies by the intratracheal and intravenous injection of living tubercle bacilli in rabbits (human and bovine strains) and in guinea pigs. A study is also being made of the appearance of the intradermal tuberculin test in guinea pigs inoculated with living tubercle bacilli intravenously and intratracheally.

This preliminary report deals only with the results obtained by the injection of a human strain of tubercle bacilli in rabbits.

*Method.* The intratracheal injection was performed through

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the lower rings of the exposed trachea, care being taken to avoid local contamination of attaching the syringe only when the needle was inserted in the trachea. The customary marginal vein of the ear was utilized for intravenous injection.

*Antigen.* A six-weeks old human strain of living tubercle bacilli (H. 60. Allen K. Krause) grown on agar glycerine was finely emulsified and one milligram of the tubercle bacilli in one cc. of normal salt solution was injected. The animals were bled at regular intervals and the complement fixation test performed with the inactivated serum in the presence of Besredka's tuberculous antigen<sup>2</sup> using 1/6 of its anticomplementary unit, two units of complement and four units of amboceptor. The antibodies were titrated with a fixed amount of complement, amboceptor, antigen and decreasing quantities of serum.

*Experiment.* Five rabbits (R1-R5) were inoculated intravenously and another five (R6-R10) intratracheally, each animal receiving a single dose as stated above. The average weight of each rabbit was 2000 to 2100 gm.

It will be noted from the table that:

1. By intravenous injection, antibodies detectable by the complement fixation reaction were already present in the serum of the animals at the end of the first week (5th to 7th day) after inoculation. After a rapid rise the strength of the test was maintained at the same level for about two weeks, followed by a second rise, reaching its maximum at the end of the first month (400 units) and from that time it grew weaker and weaker.

2. By intratracheal injection antibodies first appeared only at the end of the third week after inoculation rising to its maximum at the end of the sixth week (after inoculation) and from that time it waned gradually in strength.

*Conclusion.* The intravenous route in the production of specific antibodies by the injection of a human strain of living tubercle bacilli is superior to the intratracheal. In the former the antibodies appear earlier in the serum and are greater in number.

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<sup>2</sup> Fried, B. M., Besredka's tuberculosis antigen and the complement fixation reaction, *Am. Rev. Tuberculosis* (in press).