

central nervous system of syphilitic rabbits only in a few isolated instances. A new approach to the problem was indicated by the discovery of Kolle and Schlossberger<sup>1,2</sup> of the asymptomatic syphilitic infection of mice and rats. These investigators showed that mice and rats infected with pieces of chancre tissue of syphilitic rabbits, were capable of harboring an asymptomatic infection which could be demonstrated by injection of emulsions of their internal organs, including the brain, into normal rabbits, which thereupon developed syphilitic lesions. It was further shown by Schlossberger<sup>3</sup> that spirochetes which have thus passed through the brain of rats or mice acquired the unusual property of being able to penetrate into the brain of rabbits, a property which is maintained through successive passages from rabbit to rabbit. In these experiments and similar experiments of the authors,<sup>4,5</sup> it became possible for the first time to cause the *Spirocheta pallida* to penetrate into the brain of rabbits in a large number of cases.

The affinity of the *Spirocheta pallida* for testicular tissue, as shown, for example, by the experiments of the authors<sup>6,7</sup> in which spirochetes, introduced intraspinally into rabbits, quickly disappeared from the cerebrospinal system and localized in the testicles, suggested an interesting possibility in connection with the so-called Reynals factor. It was shown by Duran-Reynals<sup>8,9</sup> and Hoffman and Duran-Reynals<sup>10</sup> that extracts of certain organs (testicles, kidney, brain and skin) have an enhancing action on the development of vaccine virus and staphylococcus infection and that testicular extract is by far the most active. It was

further shown that testicular extract of the rabbit caused injected India ink and Prussian blue to spread much more extensively through the intercellular spaces than was the case when suspensions of Ringer's solution only were used. It is possible that the enhancing power of the testicular extract is accompanied by an effect which consists in rendering the cells more easily penetrable by the injected agents.

It now appeared promising to the authors to attempt to render the central nervous system of the rabbit more easily penetrable to spirochetes by injection of normal testicular extract. This was, in fact, done in a series of experiments of which the present article is a preliminary report. Six rabbits received an intraspinal injection of an emulsion of testicular tissue of normal rabbits. Shortly thereafter they were inoculated, 3 intratesticularly and 3 intravenously, by the usual method with syphilitic testicular tissue (Nichols strain). Six to seven weeks later testicular lesions appeared, and when the brains of the animals were removed and emulsions prepared from them were injected into testicles of normal rabbits, positive results (lesions containing numerous active spirochetes) were obtained in all the six animals. The situation, however, was complicated by the somewhat unexpected fact that a positive result was also obtained with one animal injected intraspinally with physiological salt solution. This renders the interpretation of the results obtained somewhat uncertain. In order to determine whether the effect may not possibly be due to the traumatic shock of the injection, experiments are now in progress in which distilled water and also a number of other substances are being injected intraspinally.

The net result, so far, is that spirochetes may be induced to penetrate into the central nervous system of rabbits with the aid of an intraspinal injection of normal testicular tissue, or (in one case) physiological salt solution.

In conclusion, we take pleasure in acknowledging a very stimulating discussion with Dr. Duran-Reynals which gave the immediate impetus to the experiments here reported.

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- LENARD, PHILIPP. *Great Men of Science*. Pp. xx + 389. Illustrated. Macmillan. \$3.00.

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<sup>2</sup> W. Kolle and H. Schlossberger, "Die Persistenz der Syphilisspirochäte in Mäusen, während langer Zeiträume," *Deut. med. Wochenschr.*, 54: 129, 1928.

<sup>3</sup> H. Schlossberger, "Experimentelle Untersuchungen über das Eindringen der Syphilisspirochäten in das Zentralnervensystem von Mäusen und Kaninchen," *Arb. a. d. Staats-Inst. f. exper. Therap.*, No. 21, p. 344, 1928.

<sup>4</sup> G. W. Raiziss and M. Severac, "Neurotropism of *Spirocheta pallida*," *Arch. Dermat. and Syph.*, 26: 271, 1932.

<sup>5</sup> G. W. Raiziss and M. Severac, "Asymptomatic Syphilis," *Arch. Dermat. and Syph.*, 27: 923, 1933.

<sup>6</sup> G. W. Raiziss and M. Severac, "Testicular Lesions in Rabbits Following Intraspinal Syphilitic Infection," *Proc. Soc. Exp. Biol. and Med.*, 24: 756, 1927.

<sup>7</sup> G. W. Raiziss and M. Severac, "Chemotherapeutic Studies Concerning the Penetration of Organic Compounds of Arsenic into the Cerebrospinal System," *Arch. Dermat. and Syph.*, 22: 1031, 1930.

<sup>8</sup> F. Duran-Reynals, *Compt. rend. Soc. biol.*, 99: 6, 1928.

<sup>9</sup> F. Duran-Reynals, *Jour. Exp. Med.*, 50: 327, 1929.

<sup>10</sup> D. C. Hoffman and F. Duran-Reynals, "The Influence of Testicle Extract on the Intradermal Spread of Injected Fluids and Particles," *Jour. Exp. Med.*, 53: 387, 1931.