ditions but they were not so well marked. Calcareous infarcts were not found in any of the kidneys. No vascular lesions were ever found in the aorta or in the branches of the renal arteries. On the whole the condition produced in these few animals does not resemble human nephritis, but is much more similar to the lesions observed in experimental uranium nephritis.

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Agglutination of encapsulated bacteria.

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During the past year a systematic study of the group of encapsulated bacteria (including *Bacterium pneumoniæ* Friedländer, *Bacterium rhinoscleromatis* v. Frisch, *Bacterium ozenæ* Abel-Löwenberg, and *Bacterium capsulatus mucosus* Fasching) has been carried on, employing for the purpose biometrical methods somewhat similar in character to those suggested by Winslow[1] in his work on the Coccaceæ.

During the course of the investigation, immunological methods have been used. At the outset, the reaction of agglutination was tried. Paltauf was the first (quoted by Beham[2]) to suggest that the agglutination of encapsulated micro-organisms is inhibited because the bacilli are surrounded by a slimy nucleo-protein capsule. Porges[3] was able to supply experimental proof of this. v. Eisler and Porges[4] then elaborated a method of removing the capsule, after the application of which these bacteria were agglutinable.

My own work done independently of Beham has given results in harmony with his. I have found that *Bacterium rhinoscleromatis* on injection into rabbits yields a potent agglutinating serum.

Using this serum, agglutination not only of the homologous microörganism has been obtained but a positive result was found

[1] Winslow, "Systematic Relationships of the Coccaceæ," John Wiley & Sons, New York, 1908.

[2] Beham, *Central. f. Bakt.*, Abt. 1, Orig., Bd. 66, Heft 1, p. 110.

[3] Porges, *Wiener klinische Wochenschrift*, 1905, No. 26.

[4] v. Eisler and Porges, *Central. f. Bakt.*, Abt. 1, Orig., Bd. 42, Heft 7, 660.

to occur also when four other strains of the same species, from widely different sources, were tested. The bacteria agglutinated in a dilution of the serum, ranging from 1–400 to 1–800. Two strains of *Bacterium ozænæ*, one strain of *Bacterium capsulatus mucosus* Fasching, and one strain of *Bacterium pneumoniæ* Friedlander, were not agglutinated at all by the same serum. The strains of *Bacterium rhinoscleromatis* which agglutinated were no longer encapsulated. All the other species still showed a capsule. One of the strains of rhinoscleromatis when originally isolated was not agglutinated by the serum of the patient from whom it was isolated and at that time it was encapsulated (Thro, *Proceedings New York Pathological Society*, April and May, 1910). This microörganism, then, was not agglutinable when encapsulated shortly after isolation. Later, it lost its capsule and became agglutinable. As far as my work has gone, I have found that of the species here considered rhinoscleromatis most easily loses its capsule when grown on ordinary laboratory media and becomes agglutinable.

Beham has shown that encapsulated as well as non-encapsulated species of this group have antigenic properties and may produce agglutinins. I have no data on this point as yet. The acid agglutination reaction of Michaelis, as modified by Beniasch[1] did not agglutinate *Bacterium rhinoscleromatis* without a capsule, or *Bacterium capsulatus mucosus* possessing a capsule.

Bacteria of the species here considered are not agglutinable when encapsulated, but may become so when they lose their capsule in the course of months of growth on laboratory media. Having lost their capsules, these species may be differentiated by the reaction of agglutination. Thus *Bacterium rhinoscleromatis* has been shown to differ from *Bacterium ozænæ* and from *Bacterium pneumoniæ* Friedlander, in that it more easily loses its capsule and is then agglutinated by its specific serum.

[1] Beniasch, *Zeitschrift für Immunitatsforschung*, Vol. XII, Heft 3, 1912, 268.