ent on the amount of cohesion of protein molecules taking place in the capillary channels of the membrane. In view of this phenomenon, Elford[4] has estimated that in filtration experiments with membranes of greater porosity than 10mμ, a particle must have a diameter only from one-half to one-third of that of the pore in order to traverse it. The application of this formula to the above experiments would indicate that the probable size of the encephalitis virus lies somewhere between 22 and 33 millimicrons.

7282 P

Observations on Induction of Anaphylactic Shock by the Specific Carbohydrates of Type-I Pneumococcus.

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Further comparative studies of the soluble specific substance of Avery and Heidelberger and of the specific "cellular carbohydrate"[1] by means of the experimental induction of anaphylactic shock have given additional information regarding the antigenic activities of these preparations. Avery and Tillett[2] induced fatal anaphylactic shock in passively sensitized guinea pigs with the homologous soluble specific substance of the pneumococcus, and Enders[3] reported that antiserum, after precipitation with soluble specific substance, still sensitized guinea pigs to his "A" substance but not to the soluble specific substance. This report records experiments with the type-I specific substances injected intracardially into guinea pigs which had been passively sensitized with type-I antipneumococcus rabbit serum 24 or 48 hours previously.

The minimum amount of immune serum necessary to sensitize guinea pigs so that fatal shock developed when they were injected intracardially with soluble specific substance was always greater than that required in the case of the cellular carbohydrate. On the other hand, the minimum amount of each of the specific substances which induced fatal shock in the guinea pig previously sensitized by

[4] Elford, W. J., *Proc. Roy. Soc. B.*, 1933, **112**, 384.

[1] Wadsworth, Augustus, and Brown, Rachel, *J. Immunol.*, 1933, **24**, 349.

[2] Avery, O. T., and Tillett, W. S., *J. Exp. Med.*, 1929, **49**, 251.

[3] Enders, J. F., *J. Exp. Med.*, 1930, **52**, 235.

the injection of 1 cc. of immune rabbit serum was approximately the same.

A subcutaneous injection of 1 mg., but not 0.1 mg., of soluble specific substance 24 hours after sensitization desensitized the guinea pigs completely to a subsequent intracardial injection (24 hours later) of soluble specific substance, but not to an injection of cellular carbohydrate. One mg. of the latter, however, desensitized entirely to the soluble specific substance and partially (no fatal shocks) to the cellular carbohydrate.

When the soluble specific substance of Avery and Heidelberger was added to the minimum dose of antipneumococcus serum necessary to sensitize and the mixture injected immediately into guinea pigs, the animals were not sensitized to a subsequent intracardial injection of this substance but were to the cellular carbohydrate. On the other hand, when the cellular carbohydrate was substituted for the soluble specific substance in this experiment, no sensitization was demonstrated toward either the soluble specific substance or the cellular carbohydrate.

In the foregoing experiments, the entire mixture of serum and carbohydrate was injected. In previous experiments,[1] in which the precipitates were removed, the supernatant antiserum, after precipitation by the soluble specific substance, sensitized the guinea pig to the cellular carbohydrate but not to the soluble specific substance. Antiserum, after precipitation by the cellular carbohydrate, however, failed to sensitize the guinea pig to either substance.

The results of these experiments correspond with those previously reported and record additional data concerning the broader activities of the cellular carbohydrate as compared with the soluble specific substance of Avery and Heidelberger.

7283 P

Failure of Antipneumococcus Horse Serum to Sensitize Guinea Pigs to Anaphylactic Shock with Specific Carbohydrates.

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Previous experiments have demonstrated noteworthy differences in antipneumococcus sera from the horse and from the rabbit. For