and pneumococci from their human contacts. Irrespective of the source of these organisms, it is apparent from their numbers that they found a favorable environment in the pharynx of the monkeys. Occasional hemolytic streptococcal infections have occurred in handlers of monkeys and the findings suggest that the rhesus monkey may transmit the Group A organism to man.

We wish to express our thanks to Miss M. Olmstead of the Department of Medicine who helped us with the Lancefield grouping.

8805 P

Action of the Lytic Principle of Pneumococcus on Certain Tissue Polysaccharides.

KARL MEYER, RENÉ DUBOS AND ELIZABETH M. SMYTH.

From the Department of Ophthalmology, College of Physicians and Surgeons; the Institute of Ophthalmology, Presbyterian Hospital, and the Hospital of the Rockefeller Institute, New York.

Avery and Cullen[1] obtained from both rough and smooth pneumococci a ferment capable of lysing heat-killed pneumococci. In unpublished experiments (Dubos) it was found that the same ferment preparation renders ineffective in rabbits the capsular type specific antigen of killed cells of virulent pneumococci.

A hydrolytic action of the ferment preparation of pneumococcus on two tissue polysaccharides is described here. This action seems to be identical with that of the same ferment on the pneumococci.

From bovine vitreous humor and from human umbilical cord two polysaccharides have been obtained in pure form, seemingly identical in composition, rotation, and general physical behavior.[2] They are composed of acetylglucosamine and glucuronic acid, the components having been shown to be present in equimolar ratio by isolation or quantitative analysis.

The 2 polysaccharide acids yielded reducing sugar following hydrolysis by the ferment obtained from pneumococcus autolysates. The hydrolysis is optimal between pH 5 and 6, and does not take place above pH 8 nor below pH 4.5. The action of the ferment on killed pneumococci has about the same pH optimum. The action on both the pneumococci and the 2 polysaccharide acids is abolished

1 Avery, O. T., and Cullen, G. E., *J. Exp. Med.*, 1923, **38**, 199.

2 Meyer, Karl, and Palmer, John W., *J. Biol. Chem.* (in press).

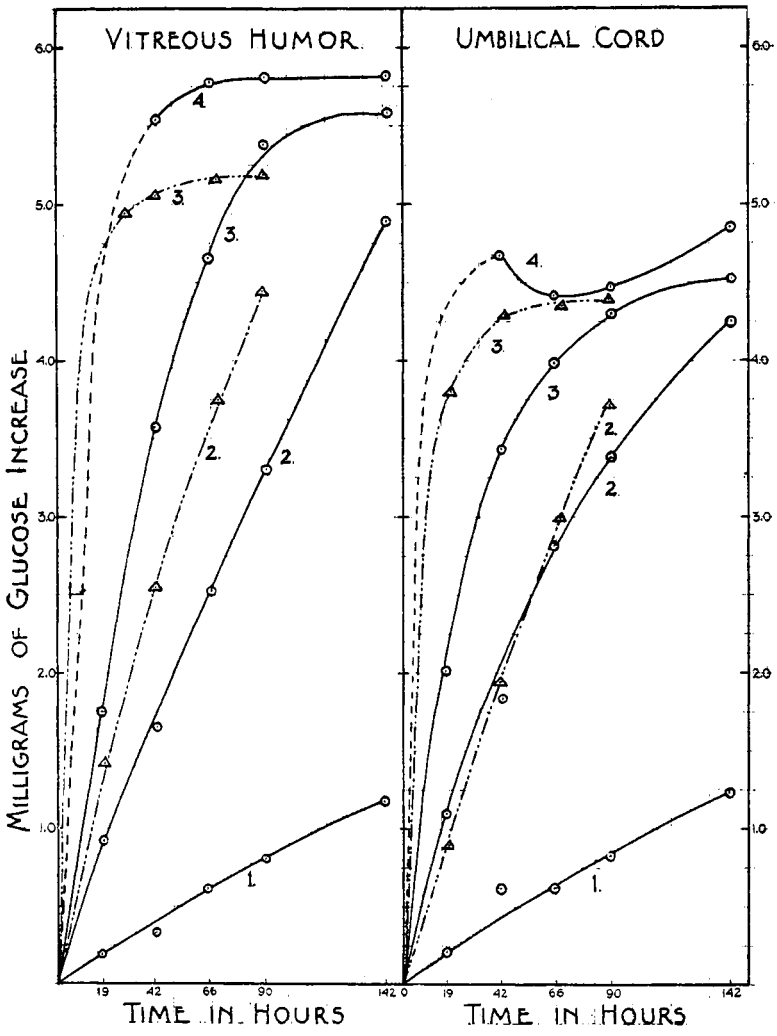

FIG. 1.

Solid lines represent experiment I; broken lines, experiment II. Numbers denote concentration of ferment solution: 1, 0.05%; 2, 0.10%; 3, 0.50%; 4, 1.00%.

by heating the ferment or by treating it with iodine. The iodine inactivation is reversed by sulfite and to a lesser degree by arsenite, as measured by the polysaccharide hydrolysis.

Further evidence that the same principle is active against the 2 tissue polysaccharides and the pneumococci is found in the following inhibition reaction: 2.0 cc. of a 0.1 percent pneumococcus ferment solution in phosphate buffer at pH 6.0 were incubated for 6 hours with 10 mg. of polysaccharide (vitreous and umbilical

cord). When tested against a suspension of heat-killed pneumococci at the end of the incubation period, the ferment was found to have lost at least 90% of its lytic activity. The control ferment solution also incubated at pH 6.0 for the same length of time in the absence of the polysaccharide retained all its activity.

The enzymatic hydrolysis of the polysaccharide yields about 70% of the theoretical amount of reducing sugar. The reaction appears specific, since commercial trypsin, saliva, taka-diastase and emulsin do not hydrolyze the carbohydrates. The pneumococcus ferment, on the other hand, is without action on chondroitin sulfuric acid or on a polysaccharide isolated from gastric mucin[3] containing acetylglucosamine and galactose.

So far the only other source of an enzyme capable of hydrolyzing the two polysaccharides is a tissue hash from rabbit iris and ciliary body. Since aqueous humor also contains the polysaccharide acid,[4] it is probable that the ferment plays a rôle in the fluid exchange of the eye.

Typical results of the hydrolysis of the polysaccharides by the pneumococcus enzyme are shown in the text figure. Ten mg. amounts of the acids in 1.0 cc. of citrate buffer, pH 6.0, were incubated with 1.0 cc. of respectively 0.05, 0.1, 0.5, and 1.0 percent solutions of pneumococcus ferment. Two drops of toluene were added. As controls the same concentration of the acids were incubated with 1.0 cc. of saline and 1.0 cc. of citrate buffer with 1.0 cc. of ferment. Reducing sugar was estimated on aliquot portions of the mixture by the Hagedorn-Jensen method. The control values were subtracted.

8806 C

Attempt to Produce Atherosclerosis in Chickens by Feeding Cholesterol.*

H. D. KESTEN, D. R. MEEKER AND J. W. JOBLING.

From the Department of Pathology, College of Physicians and Surgeons, Columbia University, New York City.

In view of the inability of various workers throughout the world

[3] Meyer, Karl, Palmer, John W., and Smyth, Elizabeth M. (unpublished experiments).

[4] Meyer, Karl, and Palmer, John W., *Am. J. Ophthal.* (in press).

* This investigation has been aided by a grant from the Josiah Macy, Jr., Foundation.