

and attempts to test the hypothesis experimentally have given negative results.

Ward and Lyons<sup>4, 5</sup> have shown that the virulence of hemolytic streptococci is ultimately dependent upon the resistance of the organism to phagocytosis. However, invasiveness (*i. e.*, the ability of the organism to disseminate from the portal of entry) is a vitally important corollary of virulence. We have found that avirulent strains of streptococci may rapidly reach the blood stream following injection into the skin, but are quickly disposed of by the cellular defenses of the body; on the other hand the speed with which organisms which are resistant to phagocytosis kill the host may be determined by the ease with which they reach the blood stream. Menkin<sup>6</sup> has recently demonstrated that the early establishment of a nonspecific inflammatory barrier at the site of injection into the skin may protect rabbits against otherwise lethal doses of pneumococci known to be highly resistant to phagocytosis.

Thus it would seem that, despite the general lack of specific opsonins in commercial streptococcus antisera, the local introduction of adequate amounts of such antisera directly into the involved area of an acute local streptococcal inflammation, would offer a means of facilitating or maintaining the localization of the infectious process by the enhancement of the fibrinous barrier and "inflammatory fixation".

## 8874 P

### Sorbitol as a Diuretic.

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The hexahydric alcohol, sorbitol, has recently become available in quantities at a low price. It is non-toxic, has enormous water binding capacity, is rapidly excreted by the kidneys after intravenous injection and has 1.88 times the osmotic pressure of the same percentage sucrose solution. Its solutions are less viscous and more easily injected than those of sucrose and are entirely stable to

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<sup>4</sup> Ward, H. K., and Lyons, C., *J. Exp. Med.*, 1935, **61**, 515.

<sup>5</sup> Lyons, C., and Ward, H. K., *Ibid.*, 1935, **61**, 531.

<sup>6</sup> Menkin, V., *J. Infect. Dis.*, 1936, **58**, 81.

heat sterilization. It apparently possesses all of the properties desirable in a physical diuretic.

A study of the diuretic action of a 50% sorbitol solution (prepared from the syrup supplied by Atlas Powder Company) as compared with that of a 50% sucrose solution has been made in 3 dogs. The dogs were placed under nembutal anesthesia and kymographic records made of arterial pressure, respiration, and urine flow from a catheter placed in the bladder. Urine volumes were measured. Fig. 1 shows the rates of urine excretion (volume per 15-minute period) obtained after intravenous injection of 50 ml. of 50% solutions of sucrose and sorbitol. The curves are numbered in the order of injection. When injected at the rate of 50 ml. in 2 minutes (38°C.) neither sucrose nor sorbitol caused appreciable changes in blood pressure or respiration. The curves indicate sorbitol to be a much more efficient diuretic in dogs than sucrose.

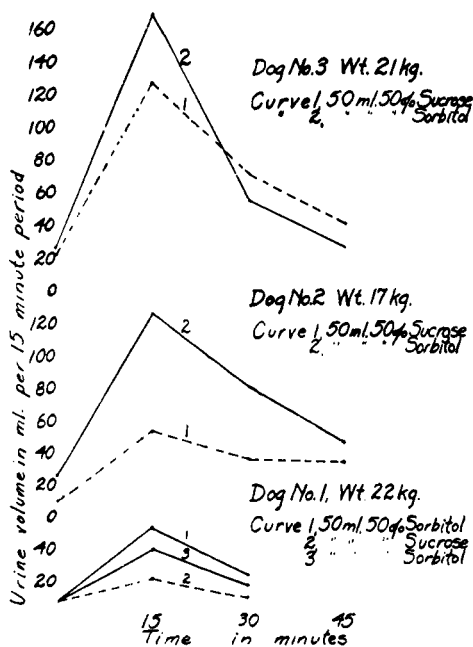


FIG. 1.

In the case of Dog 1, sorbitol was injected first (Curve 1), followed by sucrose (Curve 2), and then a second injection of sorbitol was given. No replacement of body fluids during the experiment excepting the water given with the solutions injected. Curve 3 shows that sorbitol had a much more powerful diuretic action than

sucrose even after the dehydration produced by the previous injections. In the case of Dog 2, 100 ml. of Ringer's solution was given before both sucrose and sorbitol. Otherwise procedure as in Dog 1. In the experiment on Dog 3 Ringer's solution was injected before both sucrose and sorbitol in quantity to compensate for fluid lost.

In view of the apparent superior diuretic action of sorbitol, it would seem to hold promise of being a valuable clinical diuretic agent. Its possibilities are being further investigated.

### 8875 P

#### Utilization of the Arsenic Analogue of Choline Chloride in the Bio-Synthesis of Phospholipid.

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The mechanism by which choline chloride influences the deposition of fat in the liver is by no means clear. Best, Channon and others have shown that this nitrogenous component of lecithin is capable of preventing or curing the fatty infiltration of the liver which is produced in the rat on a high fat diet or in the dog on a lean meat-sucrose diet. The finding that diets essentially free of choline cause an infiltration of fat into the livers of rats, a condition curable by the addition of choline chloride to the diets, led Best, *et al.*, to suggest that choline may be an essential dietary factor.

The most obvious hypothesis as regards the manner in which choline produces its "lipotropic" effect would involve perhaps the formation of lecithins and other choline-containing phospholipids from fat, phosphate and ingested choline, thus favoring the transport of lipid materials. There are obstacles to the immediate acceptance of such a view, of possible significance among which is the lipotropic inactivity of aminoethanol, the nitrogenous constituent of the phospholipid cephalin. Of greater import is the finding (Best, *et al.*) that betaine, the naturally occurring acid corresponding to choline, is lipotropically active. This substance is incapable of entering into the formation of phospholipids unless it is first reduced to choline by the organism, a conversion which would be of considerable biochemical interest.

Pharmacological investigations of the phosphorus and arsenic