3103

Toxicity of filtrates of B. Friedlander.

EMERSON MEGRAIL.

[*From the Department of Hygiene and Bacteriology, Medical School, Western Reserve University, Cleveland, Ohio.*]

A number of investigators have made studies on filtrable toxic products produced by bacteria in young cultures. These products have been variously called soluble toxins, X substances and endotoxins. In order to produce constant effects it has been necessary to inject the filtrates intravenously into rabbits and mice. The use of a small laboratory animal and a method of inoculation which would allow a somewhat greater range in the materials introduced would aid in a more detailed study concerning the nature of these substances.

It was thought that an organism more highly virulent for the mouse than those used by other observers might produce a filtrate in young cultures which would be toxic intraperitoneally. A strain of *B. Friedlander* (non-lactose-fermenting) was chosen which consistently caused death in about 12 hours when introduced intraperitoneally into mice. This culture was grown for various periods in veal infusion Witte peptone broth with and without 0.1 per cent dextrose. Sterile filtrates of these cultures were used for injections.

Eighteen-hour cultures produced no effect on the mice. Older cultures, 42 hours, 66 hours, 5 days, 10 days, and 20 days, while more toxic, did not produce constant effects. In some cases mice receiving 1 cc. of the filtrate survived, while others receiving 0.5 cc. died in 8 to 24 hours.

Eighteen-hour cultures grown anaerobically, and aerobic cultures in Martin's media, produced no effect in the animals. The intraperitoneal injection of such substances as gum tragacanth, bile, and 1:500 calcium chloride, as peritoneal irritants, followed by the injection of a 42-hour filtrate likewise caused no reaction.

Rabbits inoculated intravenously with 3 cc. of the filtrate of this strain, grown in veal infusion Witte peptone broth, did not show any signs of discomfort with the 18-hour cultures. One rabbit of three showed marked diarrhea in one hour after injection from the 42-hour culture but no prostration or dyspnea such

as have been demonstrated with the colon-paratyphoid group and other organisms. Rabbits inoculated with 3-day filtrates were not affected. One rabbit inoculated with an 8-day filtrate had a severe diarrhea within one hour after injection. A guinea pig received intravenously 1 cc. of the filtrate of the same strain which affected the rabbit, but showed no signs of discomfort. Rabbits injected with filtrates of another strain of *B. Friedlander* which was not virulent for mice were not affected.

The results indicate that with an organism highly virulent for mice when injected into the peritoneum, injections of filtrates of culture 18 hours to 20 days old could not be shown to be toxic for these animals when injected into the same body cavity. The effect of the filtrate of *B. Friedlander* appears to be less constant in its action in rabbits when given intravenously than that reported with other organisms.

3104

Heparin. II. Investigation of possible antigenic action.*

C. I. REED and ROBERT W. LAMSON.

[*From the Departments of Physiology and Bacteriology, Baylor University Medical School, Dallas, Texas.*]

In a previous paper[1] were reported details of experiments on the intravascular use of heparin[2, 3, 4] in etherized dogs. These experiments, together with other experiences in preservation of blood samples used for various physical and chemical analyses, have demonstrated the value of this material in laboratory work. It seemed advisable, therefore, to investigate the possibilities of its use in transfusion when, for any reason, there might be delayed injection.

* Part of the expense of this investigation was borne by a grant from the American Association for the Advancement of Science.

1 Reed, C. I., *Am. J. Physiol.*, 1925, lxxiv, 79.

2 Howell, W. H., *Am. J. Physiol.*, 1918, xlvii, 328.

3 *Ibid.*, 1922, lxiii, 434.

4 *Ibid.*, 1925, lxxi, 553.