cesses. This capacity of the secretion is lost by it after it has been heated to 100° C. This effect of the prostatic secretion is species specific. Thus, for example, the secretion of the prostate of a dog is unable to activate the movements of bull or sheep spermatozoa.

We are at present attempting to find out whether prostatic secretion contains a protein capable of activating the contractile protein of the spermatozoan tail.

I. I. IVANOV
B. S. KASSAVINA

Department of Biochemistry,
First Moscow Medical Institute.

[1] Ivanov, I. I., *Human Fertility*, 10, No. 2, 33 (1945).
[2] Huggins, *Phys. Rev.*, 25, No. 2, 281 (1945).
[3] Ivanov, I. I., *C.R. Soc. Biol.*, 103, 57 (1930).

Inhibiting Action of Fluorophosphonates on Cholinesterase

IN connexion with the interesting report[1] by Dr. M. Dixon and Dr. D. M. Needham on "Biochemical Research on Chemical Warfare Agents", we should like to mention that the first observations on the cholinesterase-inhibiting action of fluorophosphonates were made in 1941[2]. At that time the dimethyl and diethyl fluorophosphonates only were known; these compounds are somewhat less toxic than the di-isopropyl fluorophosphonate, but otherwise have similar effects. The long-lasting constriction of the pupil produced by dimethyl fluorophosphonate suggested a mode of action like that of eserine, and we found that, like eserine, it strongly inhibited the cholinesterase activity of human plasma. When the more toxic di-isopropyl fluorophosphonate was prepared, we found that it had a more potent inhibiting action on cholinesterase[3].

An account of these early observations will be published in the *Journal of Pharmacology*.

E. D. ADRIAN
W. FELDBERG
B. A. KILBY

Physiological Laboratory,
Cambridge.

[1] *Nature*, **158**, 432 (1946).
[2] Report XZ.71 to the Min. of Supply, October 1941.
[3] Report XZ.111 to the Min. of Supply, November 1942.

A Medium for Investigating the Breakdown of Pectin by Bacteria

DURING the course of an investigation on the bacteria associated with the rotting of potatoes in storage, carried out on behalf of the Agricultural Research Council, a large number of isolates was tested for ability to break down pectin.

Previous investigators have used one of the following methods in the examination of the breakdown of pectin: (1) observation of the growth of an organism in a medium with pectin as the sole source of carbon; (2) testing of enzyme preparations of cultures for ability to cause loss of coherence in strips of plant tissue, or changes in viscosity of a pectin solution; (3) measurement of the rate of utilization of a particular pectic substrate by progressive chemical analysis. While the above methods would be satisfactory, it seemed that a more suitable method, for a rapid qualitative test, would be to grow the organisms on a pectin gel. Organisms which were able to break down pectin would cause liquefaction of the medium. In the past, it has only been possible to prepare pectin gels with high sugar concentrations, and under acid or alkaline conditions[1] which would not support the growth of bacteria. Low methoxylated pectin gels[2,3] can now be prepared with a low sugar content and with an increased range of *p*H, and it is possible that they might be used in the present investigation, but they have not been available to me.

Through the courtesy of the A.S.P. Chemical Co. Ltd., of Gerrards Cross, a sodium pectate powder was obtained which would form a gel at a neutral *p*H and in the absence of sugar. The medium is prepared as follows: a basal solution is made up containing $NH_4H_2PO_4$ 1 gm., KCl 0·2 gm. and $MgSO_4$ 0·2 gm. per litre of distilled water. To this solution is added 50 ml. per litre of buffer solution (McIlvaine's phosphate-citrate buffer, 0·2*M* NaH_2PO_4, 0·1*M* citric acid). The mixture is heated to 70° C. and sufficient of the powder added to give a 1 per cent concentration. The mixture is further heated almost to boiling and held at this temperature for about five minutes. From the time of the addition of the pectate powder, the mixture must be thoroughly stirred. It has been found helpful to add Bromo Thymol-Blue to the medium as an indicator. The medium is tubed and sterilized by bringing momentarily to 120° C. in an autoclave, turning off the gas and allowing to cool. This method of sterilization[4] reduces breakdown of the pectate.

The setting of the medium is brought about by a certain concentration of calcium ions (approximately 3·2 per cent of the powder), which convert some of the sodium pectate to calcium pectate on cooling. The addition of a small proportion of a 10 per cent solution of calcium chloride increases the structural viscosity of the gel.

Tubes, inoculated by needle stabs from broth cultures, of *Bact. phytophthorum*, *B. carotovorum*, *B. aroideæ* and *Bacillus polymyxa* showed slight liquefaction after two days at 25° C., and the liquefaction was almost complete after a week. *Bs. subtilis* produced a slight liquefaction after four days. *Bact. ærogenes*, *Bs. mesentericus* and *Pseudomonas fluorescens* did not liquefy the medium after twenty days. No extensive examination of cultures of fungi has been undertaken; but *Botrytis cinerea* and *Sclerotinia minor* produce a liquefaction of the medium.

Liquefaction of this medium indicates the splitting of the pectate unit and is not necessarily the same as loss of coherence in plant tissues. Comparative tests, however, have shown that liquefaction of a pectate gel and loss of coherence of plant tissue appear to be correlated.

I am much indebted to Dr. W. J. Dowson and Dr. N. A. Burges for their advice in this work. This brief account is published as it is considered that the medium may have applications in other directions.

D. RUDD JONES

Botany School,
Cambridge.
Oct. 1.

[1] Spencer, G., *J. Phys. Chem.*, **33**, 1987 (1929).
[2] Baker, G. L., and Goodwin, M. W., Del. Agric. Exp. Sta. Bull. No. 234 (1941).
[3] Baker, G. L., and Goodwin, M. W., Del. Agric. Exp. Sta. Bull. No. 246 (1944).
[4] Davis, J. G., and Rogers, H. J., *Abs. Proc. Soc. Agric. Bacterio'.*, 41 (1938).