The *p*H optimum for the fibrinolysis is rather narrow, the activity being at its highest at about slightly acid reaction (*p*H 6·0–6·5).

The properties of the fibrinolysin formed seem identical with the properties of the fibrinolysin prepared by chloroform treatment.

PER M. PERMIN

Biological Institute,
Carlsberg Foundation,
Copenhagen.
July 2.

[1] Astrup, T., and Permin, P., *Nature*, **159**, 681 (1947).
[2] Astrup, T., and Darling, S., *Acta Physiol. Scand.*, **4**, 45 (1943).
[3] Astrup, T., and Darling, S., *J. Biol. Chem.*, **133**, 761 (1940); *Acta Physiol. Scand.*, **2**, 22 (1941).

β-Glucuronidase and Tissue Proliferation

IN a previous communication[1] it was shown that β-glucuronidase in liver or kidney rises following administration of toxic agents to mice, depending upon the organ or organs affected. It was suggested that a rise in this enzyme is associated with tissue repair rather than the damage itself. This view is confirmed by results for kidney following administration of mercuric nitrate or chloroform to male mice. In each case, the rise in the enzyme did not occur in the early stages of poisoning, but was seen when repair was well advanced.

Age	Treatment	Interval following treatment, days	G.U.*/gm. moist tissue			Histological findings
			Spleen	Liver	Kidney	
Adult	None	—	580	280	380	—
,,	2 gm. chloroform/kgm.	1	1079	939	194	Damage and repair in liver; necrosis without evidence of repair in kidney.
		8	746	711	628	Residual damage and advanced repair in liver and kidney.
,,	20 mgm. mercuric nitrate/kgm.	1	—	436	208	Severe damage without evidence of repair in kidney; liver almost normal.
		3	718	469	808	Repair almost complete in kidney; some cell division in liver.
,,	Sub-total hepatectomy	3	—	1052	—	
		5	—	882	—	Very active cell division in liver.
		8	—	1165	—	
1 day	None	–	5100	1370	881	—
5 days	,,	–	3245	1363	793	—
13 ,,	,,	–	1521	2218	606	—
15 ,,	,,	–	5169	1239	727	—

* One G.U. (glucuronidase unit) liberates 1 μgm. phenol from 0·015 *M* phenol glucuronide at 38° and *p*H 5·2 in 1 hr.

That there is a relation between tissue proliferation and β-glucuronidase is further borne out by the fact that high enzyme contents were found in the livers of adult mice following sub-total hepatectomy, and in the liver, spleen and kidneys of baby mice. These results, which are summarized in the table, may provide a simple explanation of the finding by Fishman and Fishman[2] that administration of œstrogens to ovariectomized mice causes a rise in uterine glucuronidase, and of the high figures for tumour glucuronidase recently described by Fishman[3].

LYNDA M. H. KERR
G. A. LEVVY

Department of Biochemistry,
University of Edinburgh.

J. G. CAMPBELL

Royal (Dick) Veterinary College,
Edinburgh.

[1] Kerr, L. M. H., and Levvy, G. A., *Nature*, **160**, 463 (1947).
[2] Fishman, W. H., and Fishman, L. W., *J. Biol. Chem.*, **152**, 487 (1944).
[3] Fishman, W. H., *Science*, **105**, 646 (1947).

Formation of Cellulose by *Acetobacter acetigenum*

BROWN[1] isolated from 'mother of vinegar' an organism which he designated *B. xylinum* because it formed a tough pellicle exhibiting the behaviour of cellulose. It is now known as *Acetobacter xylinum*. In more recent years, X-ray examination of the pellicle which it forms on media containing, in the several cases, glycerol and certain sugars and sugar alcohols, has shown the material to possess the same structure as vegetable cellulose (compare Hibbert and Barsha[2], Tarr and Hibbert[3], Barsha and Hibbert[4] and Khouvine[5]).

Acetobacter acetigenum, a related micro-organism, also forms a pellicle, the nature of which does not seem to have been studied. Recently, in the course of another investigation, Dr. D. Kulka working with one of us (T. K. W.) isolated a strain of *A. acetigenum* which was remarkable for the large amount of pellicle-material produced during its growth in a glucose yeast–water medium in the presence of calcium carbonate; in one experiment the dry weight of the pellicle accounted for 60 per cent of the weight of glucose initially in solution.

This strain grows well at 30° in certain natural and also synthetic media of *p*H value about 5, and it can utilize a large variety of substances as sources of energy. The pellicle from cultures on malt-wort gave the principal reactions of cellulose. Pellicles were collected from cultures grown on solutions of inorganic salts containing ammonium sulphate as the source of nitrogen, and, in the several cases, containing the following substances as the source of energy: glycol, glycerol, mannitol, arabinose, xylose, glucose, fructose, galactose, maltose, lactose, sucrose and soluble starch. The pentoses and the soluble starch afforded only slight pellicles; in the other cases the yield of material varied from 2 to 8 per cent on the carbon source. The pellicles from the pentoses and from starch were not examined in detail; chemical tests for cellulose, which were made with all the others, were positive. Further, on X-ray examination the purified pellicles gave the diagram of crystallites which is obtained on X-ray examination of cotton cellulose. When the membranes were dried under strain they showed preferred orientation. On hydrolysis with dilute sulphuric acid, the material gave glucose, characterized as the 2 : 4-dinitrophenylosazone, m.p. and mixed m.p. 264°. On acetolysis of pellicle matter with acetic anhydride, acetic acid