England, for hexamethylene *bis*diethylsulphonium diiodide.

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Influence of Sexual Stimulation on the Metabolic Activity of Deoxyribonucleic Acid in the Seminal Vesicle

Labelled adenine[1] and thymidine labelled with tritium[2] are incorporated into the deoxyribonucleic acid of the epithelial cells of the seminal vesicle of adult mice at a rate equivalent to a renewal of approximately 10 per cent of the deoxyribonucleic acid per day. Comparison of counts of cells in division and labelled nuclei in autoradiographs of the seminal vesicle and œsophagus[2] show that this renewal of deoxyribonucleic acid is approximately 45 times in excess of requirements for cell-proliferation. It seemed of interest to explore whether this incorporation of thymidine is influenced by the sexual activity of the animals.

Six male mice of an inbred strain, 6–8 weeks old, were kept in cages together with an equal number of females whilst a second group of six males were separated from females. Eight days later all animals were injected intraperitoneally with 20 μc. each of labelled thymidine and killed 19 hr. later. The seminal vesicles were fixed for 1 hr. in acetic acid—alcohol (1:3) followed by 24 hr. in formol saline, embedded in paraffin-wax and sectioned at 5–6 μ. Autoradiographs were prepared by the stripping film technique, exposed for 40 days and stained with hæmatoxylin after photographic processing.

Analysis of the preparations shows incorporation of labelled thymidine in epithelial nuclei of the seminal vesicles of all males kept together with females; the percentage of labelled nuclei and strength of autoradiographs are similar to those reported previously[2]. No labelled differentiated epithelial nuclei were found in the organs of males which had been separated from females for eight days. A very low incidence of labelled basal-layer nuclei was noted in both groups.

Previous observations on altogether 34 male mice which had been kept together with females showed incorporation of labelled thymidine in the seminal vesicles whilst those of a group of 10 animals which were accidentally separated from females one week before injection showed none. Similarly, Schooley[3] Kelly and did not find any labelled nuclei in the epithelium of the seminal vesicles of virgin male mice after injection with labelled thymidine.

It was suggested in previous papers[1,2] that the observed incorporation of labelled precursors into deoxyribonucleic acid in excess of requirements for cell-division indicates metabolic activity of the deoxyribonucleic acid in the organs concerned, though no direct connexion between these processes could be shown. The observations reported here indicate such a connexion between biological activity and incorporation; they do not make it certain whether the incorporation of labelled thymidine into the deoxyribonucleic acid of the seminal vesicles is connected with copulation or merely with stimulation due to the presence of females. It is known that the amount of cell-division in the seminal vesicle depends on the concentration of sex-hormones. Since, however, the excess of labelling over mitotic activity was found by comparing counts on adjacent sections of the same animals[2], increase in cell-division cannot be responsible for the differences in uptake of labelled thymidine due to sexual activity reported in this communication.

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Chemistry and Pharmacology of 16-Acetyl Digitalinum Verum

The 16-acetyl derivative of digitalinum has been prefaced as follows. Digitalinum verum hexaacetate was obtained by the usual reaction of digitalinum verum with acetic anhydride in pyridine solution; this hexaacetate, using snail enzyme[1], was partially deacetylated by potassium hydrogen carbonate to digitalinum verum diacetate, m.p. 181°–184°, $(\alpha)_D$ −24·0° (CH_3OH). The substance was separated by partition chromatography from the reaction mixtures, but it could not be induced to crystallize. The existence of acetoxyl group on carbon atom 16 of this glycoside has been confirmed by the facts that on treatment with alumina it affords a hydrogenated derivative, and that the molecular rotation difference between digitalinum verum and this compound is similar to the difference between gitoxigenin and oleandrigenin. Evidence is also given by the fact that it is hydrolysed into oleandrigenin on Mannich hydrolysis at low temperature (0°–5°).

The pharmacological action of 16-acetyl digitalinum verum was compared with digitalinum verum or *k*-strophanthin using various animals such as frogs, guinea pigs and cats. First, cardiotonic action was investigated. Drugs were administered to the isolated frog heart through which Ringer's solution was perfused. 16-Acetyl digitalinum verum augmented the amplitude of ventricular contraction and increased the output in concentrations above 1:7,500,000. Digitalinum verum and *k*-strophanthin acted similarly in concentrations above 1:5,000,000 and 1:10,000,000 respectively. Guinea pig heart-lung preparations were also used. 16-Acetyl digitalinum verum increased the output and arterial pressure and decreased right intra-atrial pressure in concentrations above 1:10,000,000 and *k*-strophanthin acted similarly above 1:20,000,000. From these results, 16-acetyl digitalinum verum seemed to be weaker than *k*-strophanthin but stronger than digitalinum verum in cardiotonic action.

Secondly, lethal doses were measured. In frogs, LD_{50} was measured by injecting drugs subcutaneously. In guinea pigs and cats, minimal lethal doses