been found in the few experiments which have so far been done that T wave changes occurred uniformly and that the blood pressure usually rose, the increase varying from 20 to 66 mm. Hg.

Data on the effect of the drugs on rate and on conduction are reserved for later publication and likewise detailed descriptions of differences between the two drugs.

CONCLUSIONS.

With doses of therapeutic range equal to 30 per cent. of the calculated lethal dose, digitalis and strophanthin (1) increased the contractile power of the cardiac muscle, and by so doing increased the volume output. This effect supplies a firm basis for the statement that these drugs may exercise a beneficial action. (2) At the same time, the T wave is usually altered, and (3) there is a transient elevation of blood pressure.

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A method for the estimation of lactic acid in blood.

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The procedure is based upon the observation of Denigès[1] that lactic acid, in the presence of concentrated sulphuric acid, is converted into acetaldehyde, and can then be detected by certain reagents, particularly phenols and morphine alkaloids.

5 c.c. of untreated whole blood or serum is delivered directly into 15 c.c. of acidified copper sulphate solution, the flask being in the meanwhile gently shaken. It is heated 4–5 minutes on the water bath, cooled, and an excess of powdered calcium hydrate is added. It is then allowed to stand for 30 minutes and filtered. A water-clear solution is obtained which is free from sugar and other aldehyde forming substances, and which does not char appreciably during the subsequent treatment with sulphuric acid. One part of filtrate is added cautiously to 4 parts of pure concentrated sulphuric acid, the mixture being meantime shaken and

[1] G. Denigès, *Ann. de Chem. et de Phys.* (8), *18*, 149.

cooled in a dish of ice water. It is then placed in the boiling water bath for 2 minutes and immediately cooled in ice water, after which 3 drops of 5 per cent. solution of guiacol are added. With pure lactic acid solutions a rose color is developed which remains stable and clear for some time. The maximum color is developed in the blood filtrates in about 20 minutes and it must then be read against standards prepared with known amounts of lactic acid (conveniently prepared from zinc or lithium lactate). An appreciable color is produced by 0.01–0.02 mg. of lactic acid. The colors may be compared in small flat-bottomed Nessler tubes, or the concentrated acid solutions may be compared in the Duboscq colorimeter without injury to the cups. On prolonged standing a turbidity develops in the blood filtrates which renders it impossible to read them accurately.

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Effect of opiates on memory and behavior of albino rats.

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Studies were made by the authors on the behavior of white rats in Watson's circular maze. A total number of eighteen rats was used. The animals were trained to find their way through the intricate labyrinth of the maze in the shortest period of time without making any error. They were then injected with the various drugs studied, and their behavior, both immediately after injection and for some time afterwards, was observed. The experiments on the rats in the maze gave data concerning the memory habit of the animals, their activity, and the coördination of their movements after the administration of the narcotics. A large number of experiments was performed on different rats, and the effects of the following opiates were studied: Morphin, codein, thebain, narcotin, narcein and papaverin. In addition to the individual alkaloids, the following combinations were also administered: pantopon (total opium alkaloids) and narcophin (morphin plus narcotin).