after period. Furthermore, the same effect is produced with the different doses. The latter effect is shown very strikingly by dog No. 2, but not so clearly by dog No. 1 with the exception of experiment No. 1, and possibly No. 3.

Although there is an excess output of nitrogen after cessation of injections, it is not at any time comparable with the amount retained. Also to be noted in this respect is the fact that in both dogs a minus balance is reached sooner after the 60 B.U. than in the other experiments. However, this may not prove to be especially significant.

In every experiment the retention is due to a decrease in urinary nitrogen; none in fecal nitrogen. Partition of urinary nitrogen indicated a change in urea paralleling that of the urinary nitrogen, ammonia and creatinine remained constant, creatine increased the second period after cessation of injections.

In every experiment the dogs' weights showed a gradual and definite increase which continued into the first period after injections and then gradually returned to basal. Dog No. 2 showed a much greater increase in weight than dog No. 1.

No excessive thirst or diuresis was noted.

Whether the retention of nitrogen is due to the male hormone, *per se,* or to an indirect effect, e. g., the anterior pituitary growth hormone, cannot at present be definitely stated.

7970 C

Further Observations on the Action of Adenosine on the Perfused Heart.

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In an earlier study[3] of the action of adenosine on the perfused heart of the rabbit it was believed that this substance improved the beat of the heart, although records which were obtained by attaching a lever to the ventricle never showed an increase in height of contraction. There was no change in amplitude provided the rate was kept constant. When the normal rhythm was slowed by adenosine there was a decrease in height of contraction due, as Dale[1] has

[3] Wedd, A. M., *J. Pharmacol. and Exp. Therap.*, 1931, **41**, 355.

[1] Dale, A., *J. Physiol.*, 1930, **70**, 455.

shown, solely to the slowing. Drury[2] later reported that on rare occasions adenosine caused a slight increase in the mechanogram, which usually occurred when the heart was in poor condition, and the coronary outflow was considerably increased by the injection. Wedd and Fenn[4] found that when adenosine was added to a bath in which was suspended an auricle or a strip of heart muscle, either cold-blooded or mammalian, depressed contractility invariably resulted. At times when injected into the rhythmically stimulated perfused heart adenosine has been seen to depress excitability and cause a short period of 2:1 response (Fig. 1). From observations

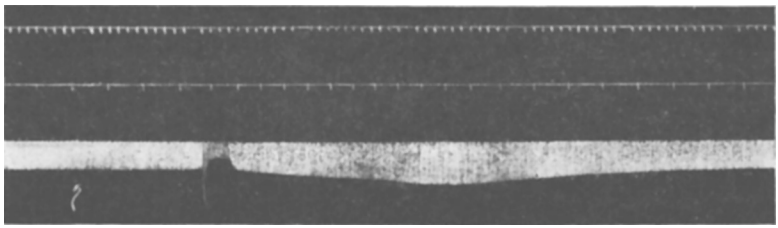

FIG. 1.
Perfused cat heart. Upper line, time, 5 seconds; middle line, Condon tipping bucket; lower line, myogram. 0.4 mg. adenosine injected at arrow.

of the effect on the muscle itself, it has been concluded that if adenosine were to improve the beat of the heart it must do so by its vasodilator action.

A series of experiments has recently been undertaken to study the influence of certain choline derivatives on the heart. The technique was similar to that previously employed. The hearts of 35 rabbits and of 7 cats have been perfused. In each experiment from one to 3 injections of adenosine were made to test the reactivity of the coronary vessels. These injections were usually given toward the end of the experiment when the heart was no longer in good condition and the coronary outflow had fallen off. Under such circumstances, almost without exception, when adenosine caused an increase in coronary flow the height of the mechanogram showed a definite, and often a marked, increase (Fig. 1). The reason for the failure to observe any influence on the force of contraction in earlier experiment is now apparent. Only nucleic acid derivatives with a vaso-dilator action were then investigated. It was pointed out that with large doses or repeated smaller doses the coronary vessels be-

2 Drury, A. N., *J. Physiol.*, 1932, **74**, 147.

4 Wedd, A. M., and Fenn, W. O., *J. Pharmacol. and Exp. Therap.*, 1933, **47**, 365.

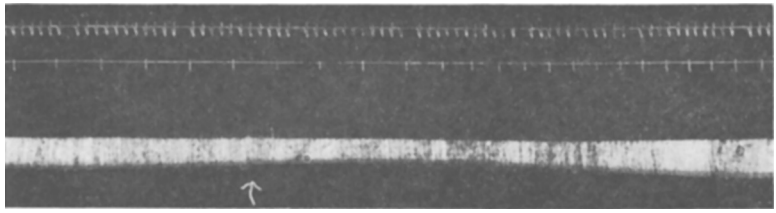

FIG. 2.
Perfused rabbit heart. Perfusion fluid contains acetyl-B-methyl-choline, concentration 1:50,000, which has slowed the flow and diminished the beat. 0.6 mg. adenosine injected at arrow.

came widely dilated and most preparations were abandoned because the vessels had become non-reactive in a state of maximum dilation. The rate at which the heart was maintained was just above the normal rhythm, approximately 120 to 150 beats per minute, and this together with a high or maximum coronary flow at all times, provided the most favorable conditions that could be established, and so the recorded beat was necessarily optimum as far as it could be affected by external factors. From more recent experiments it has become certain that when the condition of the heart is not good and the coronary flow has fallen off, the contraction may be expected to improve as a result of the increase in flow that follows adenosine. The value of adenosine in improving the condition of the perfused heart and prolonging the usefulness of the preparation has been repeatedly demonstrated in these experiments.

The power of adenosine to counteract the diminution in coronary flow produced by acetyl choline has been reported.[4] When the coronary flow and the size of the beat have been reduced by acetyl-B-methyl-choline, adenosine causes an increase in flow and an increase in the size of the beat (Fig. 2).

7971 C

Unusual Allergic Manifestations in B. Dysenteriae Infections.

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In a study of 125 cases of bacillary dysentery caused by various strains of *B. dysenteriae,* namely, Flexner, Duval, Shiga and Hiss-Y, it was noted that 4 of these presented symptoms that differed