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Production of Ventricular Extrasystoles and Pulsus Alternans by Adrenalin.

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(Introduced by Maurice B. Visscher.)

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Higgins, Ewing, and McGuigan[1] have produced by intravenous administration of pressor drugs and by clamping the abdominal aorta an apparent slowing of the heart rate in vagotomized dogs under morphine-nembutal anesthesia. As the blood pressure fell from its maximum value, the mercury manometer generally recorded an abrupt change to just one-half the rate at the time.

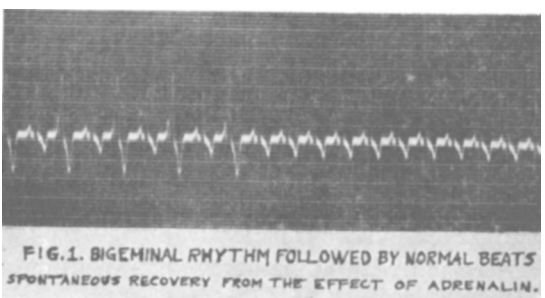

FIG. 1. BIGEMINAL RHYTHM FOLLOWED BY NORMAL BEATS SPONTANEOUS RECOVERY FROM THE EFFECT OF ADRENALIN.

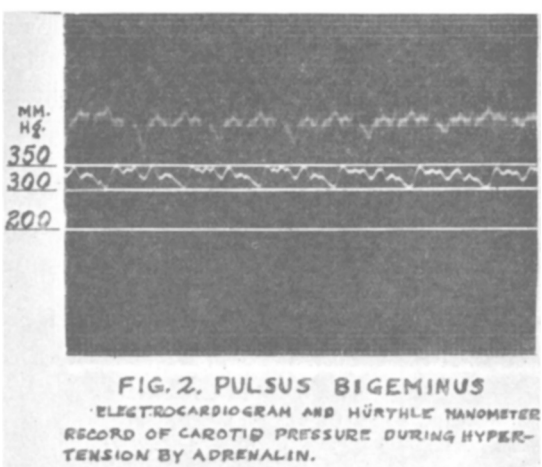

FIG. 2. PULSUS BIGEMINUS
ELECTROCARDIOGRAM AND HÜRTHLE MANOMETER RECORD OF CAROTID PRESSURE DURING HYPERTENSION BY ADRENALIN.

[1] Higgins, Ewing, and McGuigan, *J. Pharmacol. and Exp. Therap.*, 1932, **44**, 353.

When a certain lower level of pressure was reached, the normal rate was abruptly resumed. We have made electrocardiographic studies of this effect.

In the experiments reported here the typical slowing was produced by the intravenous injection of 5 cc. of 1-10,000 adrenalin into dogs under morphine-nembutal anesthesia. Electrocardiograms were recorded from lead 1. In several experiments the carotid blood pressure was recorded optically along with the electrocardiogram by a Hürthle manometer.

We find that the appearance of a slower rate is due to a pulsus bigeminus (Figs. 1 and 2), consisting of alternate normal beats and beats in which the ventricular contraction is premature. A pulsus alternans is indicated by the carotid blood pressure tracing (Fig. 2) as recorded by the Hürthle manometer.

A bigeminal rhythm due to pressor agents has been observed by Levy[2] in cats under chloroform and under ether anesthesia, although irregularities due to acute hypertension in vagotomized animals have not been thoroughly investigated. The work of Higgins, Ewing, and McGuigan must therefore be regarded as a confirmation and extension of the studies of Levy. It appears from our studies that the bigeminal rhythm may be obtained under nembutal anesthesia as well as under chloroform and ether and that the major condition necessary for its appearance is a sharply elevated blood pressure.

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Effect of Rapid Transfusion on Duration of Systolic Ejection of the Left Ventricle.*

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Katz[1] and Wiggers[2] have shown that there is an increase in the duration of the systolic ejection phase following intravenous saline infusion. The increase in duration of this period is independent of any heart rate change and was shown to be due to distention of the

[2] Levy, A. G., *Heart*, 1914, **5**, 299.

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[1] Katz, L. N., *J. Lab. and Clin. Med.*, 1921, **6**, 291.

[2] Wiggers, C. J., *Am. J. Phys.*, 1921, **56**, 415, 439.