the T-wave in many curves. Paroxysmal auricular fibrillation was noted in the electro-cardiograms of several animals.

The relatively heavy weight of the metal in the right heart hardly enters as a factor in the interpretation of the curves as the heart empties itself usually quite completely of the metal after a few minutes. It is thought that the acute heart dilatation results from a partial obstruction in the arterial side of the pulmonary circulation.

4844

Reflexes from the Gall Bladder to the Heart.*

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The sudden release of bile obtained by incising the gall bladder of a decerebrated or ether-anesthetized frog is almost invariably attended by an abrupt change in the rate and character of beating of the heart. The first event is a transient arrest of the entire heart lasting between 1 and 10 sec., almost always followed by a sinus bradycardia lasting from ½ to 10 min. Subsequently there is a return to the initial rate of beating although in a few instances progressive slowing, leading to excessive dilatation and permanent arrest, have been observed. Not infrequently the first event to be noted is a transient acceleration which precedes the slowing. The heart appears to beat much more forcibly with the inception of the slower rate. The latent interval for the reflex is a fraction of a second to a second or more.

Electrocardiograms made from base-apex leads show the cessation of activity of the sinus and ventricular portions of the heart followed by increased amplitude of R and a rather characteristic inversion of T. That the changes in the initial and final ventricular complexes are not directly associated with the reflex are to be found in the repetition of electrical effects, following an occasional sinus block which appears spontaneously after the resumption of a normal rate of beating. Such an effect is quite comparable to aberrant complexes following premature beats in mammalian electrocar-

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diograms. Prolongation of the PR interval does not occur and an extra-systolic arrythmia cannot definitely be determined in the electrograms.

Atropinization, decapitation or section of the vagi prevent the reflex.

In the frog there is a specific reflex from the gall bladder to the heart which appears to have a vagal origin. Katz[1] has suggested that the characteristic inversion of T with the inception of a slower rate of beating may well be a vagal effect producing asynchronous cessation of electrical effects in a ventricle in which there is decreased conduction. Irritation of the gall bladder by thermal or other instrumental means does not produce the succession of events noted when the stimulus is adequate. Acute pressure changes in the extra-hepatic ducts are thought to constitute an adequate stimulus for the production of the reflex. It has also been suggested[2] that this may be the mechanism operating for the production of arrythmias frequently seen in the human with so-called gall bladder disease, especially cholelithiasis.

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Fibrillation and Augmented Contractile Response of the Tongue Following Strophanthin and Digitalis.*

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The response of the dog tongue to minimal break shocks applied to the intact or divided peripheral end of the hypoglossal nerve in the neck is greatly increased following the administration of digitalis-tincture or strophanthin. There is usually a fairly progressive increase in the response following the administration of the tincture preparation by way of the femoral vein. Injected into the lingual artery, fibrillation of that side of the tongue almost invariably follows and may persist for 30 minutes or an hour. Large doses applied this way may at first produce a heightened response to electrical

[1] Katz, L. N., personal communication.

[2] Buchbinder, William C., *Arch. Int. Med.*, 1928, xlii, 743.

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