

METHODS

A NEW METHOD OF RECORDING CONTRACTIONS OF LYMPHATIC HEARTS

G. Ya. Makevnin and N. V. Pelipenko

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We have developed a method of recording the contractile activity of frog lymphatic hearts based on transformation of mechanical oscillations of a pen into electrical waves by means of a small capacitor, the capacitance of which is varied during contractions of the object. The moving part of the pick-up is a light rectangular metal plate fixed to an aluminum pointer balanced by a spring, and the stationary part of the pick-up consists of two bronze plates fixed in an insulator.

The lymphatic heart is held by a small hook connected to the pointer by a thin silk thread. With each contraction of the lymphatic heart the moveable part of the pick-up is displaced relative to its stationary part. To record changes in capacitance of the pick-up a modification of the small capacitance measurer based on a 6N1P tube is used, [3]. The measurer consists of a high-frequency push-pull generator incorporated in a bridge circuit (Fig. 1). The constant elements of the bridge are resistors R_2 and R_3 and the internal resistance of the right triode, and the variable element is the internal resistance of the left triode. When the capacitance of the oscillatory circuits of both generators is equal, no current flows at the output, but with a change in capacitance of one circuit the bridge becomes unbalanced and a current flows at the output.

To increase sensitivity of the scheme the initial capacitance of the oscillatory circuits are reduced from 10-20 to 1.5 pF and the pick-up is connected directly in the measuring circuit. Instead of a galvanometer, a type F73/U amplifier is connected to the output of the measurer, amplifying the current reflecting unbalancing of the bridge, which is then recorded by means of a type N-370 self-writing instrument.

The suggested method can be used to record very small changes in activity of the lymphatic heart. The amplitude of the cardiogram can be increased by means of an amplifier to the width of the tape of the

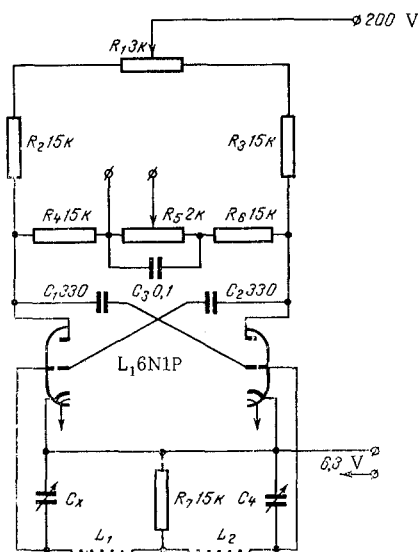


Fig. 1. Circuit of pick-up for recording contraction of lymphatic heart. Explanation in text.

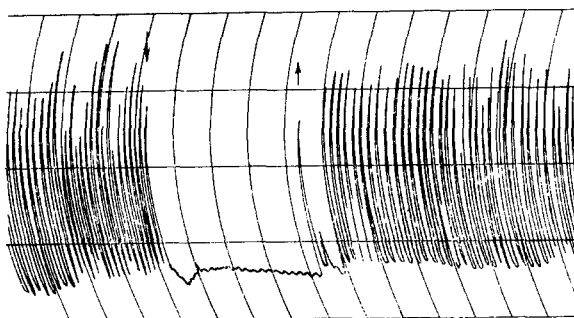


Fig. 2. Contraction of right posterior lymphatic heart recorded by a type N-370 instrument by means of the pick-up. Arrows denote inhibition of contractions of lymphatic heart during electrical stimulation of the thalamus.

Department of Normal Physiology, Kuban Medical Institute, Krasnodar (Presented by Academician V.V. Parin). Translated from *Byulleten' Éksperimental'noi Biologii i Meditsiny*, Vol. 66, No. 8, pp. 121-122, August, 1968. Original article submitted July 31, 1967.

self-writing instrument (Fig. 2), namely 100 mm, which is 5-10 times greater than the amplitude of the mechanocardiogram of the lymphatic heart. The apparatus can also be used to record any displacement of low amplitude.

LITERATURE CITED

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