The immune sera used in this study were kindly furnished us by Dr. J. Fürth[3] and Dr. J. D. Aronson. The fish bacillus in Table I is a new species isolated by Aronson.[4]

3061

A study of the electrical field surrounding heart muscle.

W. H. CRAIB.* (Introduced by Edward P. Carter).

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In a study of the electrical field surrounding excited cardiac muscle, the writer has applied the present conception of electricity as understood by the electron theory.

It has been possible to advance two sources of experimental evidence, based upon the mathematical theory of a specifically defined electrical conception, from which it seems possible to come to but one conclusion, namely that an element of heart muscle when passing through the stages of excitation, contraction and recovery, exhibits first electrical polarity in one direction for a very limited period of time, and subsequently a reversed polarity for a relatively prolonged period of time.

Before being accepted as applicable to the study in question, the mathematical theory was tested experimentally with complete agreement between experimental and theoretical results.

The above conclusion depends on:

(1) The fact that the measured electrical field surrounding both cold and warm blooded hearts, under certain conditions, can apparently be described accurately in terms of an equation derived as suggested above.

(2) The striking and complete agreement between the deflections theoretically predicted, on the basis of the hypothesis advanced, for varying positions of two electrodes on a strip of cardiac muscle, with those obtained by actual experiment.

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[3] Fürth, J., *J. Immunol.*, in press.

[4] Aronson, J. D., forthcoming publication.

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(3) The relation between the electrical axis of Einthoven and the cardiac muscle fibres excited at any given instant, as demonstrated by many observers.

It has further been possible to demonstrate that the curve recorded from these simple muscle strips can be shown to be entirely at variance with the previously accepted theory of the spread of the so-called wave of negativity.

3062

The constitutional element in the etiology of pneumonia.

RAYMOND PEARL.

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A detailed genetic and biometric study has been made of a family of 13 brothers and sisters all of whom have had broncho or lobar pneumonia one or more times. One has had it twice, and one has had it three times. Seven of the 13 have died of it. One has tuberculosis of the lungs, and another presents clinical symptoms which make it probable that he also has. There have been in the sibship 87.2 person-years exposure to risk, counting the "infant" deaths to have occurred at 0.3 year, which is probably as fair as any other assumption, it having been shown that the deaths of the first year of life center at 0.3 year. In these 87.2 person-years of exposure occurred 16 cases of pneumonia, or 18 per 100, and 7 deaths, or 8 per 100 person-years exposure. Unfortunately, owing to lack of morbidity data, we cannot make any exact comparison of the case incidence rate of pneumonia in this family with that in the general population. But that it is enormously higher is obvious. Every day experience indicates that nothing like 100 per cent of all persons have pneumonia before reaching the age of 19.

In the case of mortality a more exact approach is possible. If the age-specific mortality rates for pneumonia in the U. S. Registration Area (exclusive of North Carolina) in 1910 are applied to a group of 13 children having the same age distribution as the