

that the local immunity to subsequent skin infection is a function of the antibodies in the general circulation.

Contrary to the findings in the case of bactericidal substance, it has not been possible by the method employed to demonstrate any local formation or concentration of virucidal antibodies.

8285 P

Potential Variations of Extremities and of Precordium in Myocardial Disease.

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Wilson, Macleod, and Barker¹ described electrocardiographic leads which record the potential variations produced by the heart beat at a single point. These leads were obtained by pairing the point in question with a central terminal connected through separate, identical, non-inductive resistances with the right arm, left arm, and left leg respectively. Further details and slight modifications were published.² The potential variations of the extremities and of 6 precordial points in normal subjects were studied in Wilson's laboratory.³ In the past few years Wilson and his associates have taken numerous curves in various types of heart disease by this method, but only a few of these have been published.^{4, 5}

Since July 1934, this method has been used in the study of heart disease on the wards of the Third Medical (N. Y. U.) Division of Bellevue Hospital. As in the study of normal subjects referred to³ the electrocardiograms taken in each case were the 3 standard leads, the potentials of the 3 extremities, and the potentials of 6 precordial points. All electrocardiograms were taken with a single stage, vacuum tube amplifier in circuit with the string galvanometer.

¹ Wilson, F. N., Macleod, A. G., and Barker, P. S., *PROC. SOC. EXP. BIOL. AND MED.*, 1932, **29**, 1011

² Wilson, F. N., Johnston, F. D., Macleod, A. G., and Barker, P. S., *Am. Heart J.*, 1934, **9**, 447.

³ Kossmann, C. E., and Johnston, F. D., *Am. Heart J.*, 1935, **10**, 925.

⁴ Wilson, F. N., Johnston, F. D., Hill, I. G. W., Macleod, A. G., and Barker, P. S., *Am. Heart J.*, 1934, **9**, 459.

⁵ Wilson, F. N., Johnston, F. D., and Barker, P. S., *Am. Heart J.*, 1934, **9**, 472.

This amplifier was designed and constructed by Dr. Franklin D. Johnston of the University of Michigan Medical School, to whom the author takes this opportunity to express his sincere appreciation. In about one-third of the cases the curves were taken simultaneously with standard lead I.

To date 183 patients have been studied. They include cases with left or right deviation of the electrical axis with or without cardiac hypertrophy; discordant and concordant left bundle branch block; typical and atypical right bundle branch block; intraventricular block; acute rheumatic myocarditis; acute fibrinous pericarditis; one case each of pericarditis with effusion and dextrocardia; and 45 cases of fresh or old infarction of the myocardium.

Thus far the method has found its greatest clinical application in the location of the conduction defect in bundle branch block, and in the diagnosis of both new and old myocardial infarcts. The alterations in the initial ventricular deflections of the precordial potentials are more characteristic when the infarct is on the anterior than when it is on the posterior wall of the heart, and are similar to those found by Wilson and his associates clinically and experimentally when the exploring electrode was paired with the left leg in humans,^{6,7} or the left hind leg in dogs.^{8,9} Temporary changes in the RS-T segment, and temporary or permanent changes in the T wave are variable, and depend on several factors, the most important of which appears to be the orientation of the exploring electrode with respect to the underlying dead and injured muscle.

Fourteen of the 183 cases studied came to autopsy. Eight of these showed infarcts of the myocardium. These hearts have been sectioned by the method used by Dr. Clarence E. De La Chapelle in the study of a large series of hearts with infarcts presently to be reported. Correlation of the precordial electrocardiographic findings with the cardiac pathology in this small group has brought out the following points with regard to myocardial infarction: (1) the greatest changes in the initial ventricular deflections are obtained when the exploring electrode is placed directly over the dead muscle; (2) in one case with extensive fibrosis of the anterior wall and a

⁶ Wilson, F. N., Barker, P. S., Macleod, A. G., and Klostermeyer, L. L., *Proc. Soc. Exp. Biol. and Med.*, 1932, **29**, 1006.

⁷ Wilson, F. N., Macleod, A. G., Barker, P. S., Johnston, F. D., and Klostermeyer, L. L., *Heart*, 1933, **16**, 155.

⁸ Wilson, F. N., Johnston, F. D., Hill, I. G. W., and Grout, G. C., *Proc. Soc. Exp. Biol. and Med.*, 1933, **30**, 799.

⁹ Wilson, F. N., Johnston, F. D., Hill, I. G. W., and Grout, G. C., *Trans. Assn. Am. Phys.*, 1933, **48**, 154.

relatively recent infarct in the posterior wall of the left ventricle the precordial potentials simulated those of anterior wall infarct; (3) in bundle branch block the QRS may be similar to, though wider than, that found with infarction of the anterior wall of the heart. This may easily lead to erroneous diagnosis as in one case of this series that was further complicated by marked displacement of the heart by a large aortic aneurysm. (4) Small scars in the posterior wall cannot be detected. (5) The presence of an infarct in the anterior wall may be very evident from a study of the precordial potentials when standard leads are not characteristic.

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Stimulation of Abnormal Mammary Growth by Large Amounts of Estrogenic Hormone.

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(Introduced by Edgar Allen.)

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Purified estrogenic hormones (theelin and theelol)* induced a growth of the mammary duct system (Turner, *et al.*¹) Theelin stimulated a growth of the mammary duct system of male mice (Turner and Gomez²; Gardner, Diddle, Allen, and Strong³). The extent and type of development were comparable with that observed in mature virgin female mice or male mice bearing ovarian grafts (Gardner⁴).

The water soluble hormone (theelin) in daily doses of 1 to 5 rat units administered subcutaneously in 2 injections induced a localized excessive development of lobules of alveoli along the mammary ducts of male mice of one strain (C₃H). A high percentage of females of this strain developed mammary cancer. Similar lobules of alveoli have been found in the mammary glands of male mice from one other cancer susceptible and one cancer resistant strain when theelin had been administered for periods of several months.

* "Theelin" and "Theelol" refer to the Parke, Davis Company products.

¹ Turner, C. W., *et al.*, *Anat. Rec.*, 1932, **53**, 227.

² Turner, C. W., and Gomez, E. T., *Mo. Agr. Exp. Sta. Res. Bul.* 206, 1934.

³ Gardner, W. U., Diddle, A. W., Allen, E., and Strong, L. C., *Anat. Rec.*, 1934, **60**, 451.

⁴ Gardner, W. U., *Endocrinology*, 1935. In press.