

method of employing the blood-serum of the colostrum-fed, furthermore, does not cause colostration.

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Abnormalities in the Q R S group of the electrocardiogram associated with myocardial involvement. (Preliminary report.)

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We have noted the association of definite peculiarities in the electrocardiogram, indicative of disturbed intraventricular conduction, with such clinical conditions as are usually accompanied by myocardial involvement.

The normal electrocardiogram is to be considered the result of the passage of an impulse at a normal velocity through the usual channels, *i. e.*, node of Tawara, main stem, bundle branches and arborizations which consist of the so-called Purkinje fibers. The latter form a network covering practically the entire endocardial surface of the ventricles. The velocity of the impulse through Purkinje fibers is at least ten times faster than its rate through ordinary ventricular musculature. The impulse reaches the ventricle normally through the Purkinje fibers, stimulating the ventricular walls practically as a whole. An experimental injury to the Purkinje fibers delays the propagation of the impulse. A lesion only partially involving either bundle branch or an extensive lesion of the arborizations of a branch would cause a delay in the transmission of the excitation wave over the area supplied or damaged. An experimental block of either right or left main branch completely interrupts the passage of the impulse over normal channels to the corresponding ventricle, the spread then occurring through ordinary muscular connections. This gives a characteristic electrocardiogram differing in many respects from those to be described here which we believe to be intermediate forms between the normal and those due to bundle branch block. It is possible that some of the clinical records interpreted as bundle

branch block may be instances of only partial blocks or rather of lesions beyond in the arborizations. Our gross pathological specimens tend to support this view.

The criteria in the electrocardiograms which we have used are in general as follows:

1. Abnormal prolongation of the time interval of the *QRS* group beyond the normal limit of 0.1 second. This prolongation is most manifest in a widening of the *R* wave, so that its foot pieces are abnormally separated. The *R* wave no longer has its slender, tall, spike-like appearance, but is broader and sometimes blunter than normally.

2. Notching of the *R* wave. This notching may appear on the ascending or descending limb, on both limbs, or at the peak. It may be multiple, and its degree and location may vary slightly from beat to beat. In arrhythmias, the shorter the preceding inter-ventricular interval, the more pronounced the evidence of disturbed intra-ventricular conduction.

3. Low voltage as expressed by a low amplitude of the waves in all three leads. This change is not uniformly present, but when it occurs it helps to differentiate this type from the electrocardiograms typical of bundle branch block.

4. Absence of the typical diphasic curves with huge *T'* waves found in experimental bundle branch block.

We have obtained records of 17 such cases which presented the clinical pictures of arteriosclerosis, coronary artery disease, angina pectoris, cardio-vascular-renal disease, syphilis, myocardial disease, some associated with auricular fibrillation or flutter, and we have learned that the prognosis of these cases is serious—probably graver than that of those individuals who present records typical of block of the right or left *chief* branches of the bundle of His.

Pathology.—In but five of the cases have we had an opportunity to examine the hearts pathologically; in a sixth case we secured only the septum including the atrioventricular bundle. Serial sections are being prepared.

1. At the present time we can report that four of the cases showed coronary artery sclerosis with closure of the anterior descending branch of the left coronary artery. This artery gives off septal branches which supply the anterior part of the septum.

(The bundle of His and its two main divisions are supplied chiefly by branches from the right coronary artery.)

2. All five cases had a widely disseminated patchy sclerosis. The one case which did not belong to the atherosclerotic group was aged twenty and had no known etiology for the interstitial myocarditis except a recent grippe with cardiac disturbance.

3. The pathological changes, especially the sclerosis, predominate in the endocardial and subendocardial layers, *i. e.*, in the region of the Purkinje network, as compared with the outer two thirds of the ventricular musculature.

4. These changes were grossly more marked in the left ventricle than in the right.

Experiments with the use of two galvanometers have been planned to test out our tentative suggestion that the above mentioned changes in the electrocardiogram are evidence of a serious conduction disturbance in the tissues beyond the termination of the right and left chief branches of the atrioventricular bundle.

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The occurrence of lichenase in the digestive tract of invertebrates.

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A reducing sugar identified as glucose by the formation of the characteristic osazone was produced from lichenin (purified carbohydrate and crude extract of Iceland moss) by the action of extracts of the hepatopancreas or alimentary canal of twenty species of invertebrates, representing the following phyla; Porifera, Annelida, Echinodermata, Mollusca, Arthropoda, and Tunicata. No evidence of a lichenin-splitting enzyme was observed in twelve species of vertebrates, embracing the following classes: Pisces, Amphibia, Reptilia, Aves, and Mammalia. The activity of the preparations tested was in every case controlled by tests for an amylase, which was invariably found to be present. Extracts of muscle tissue of the crustaceans could not split lichenin. The