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Prolonged complete heart-block, without lesion of the bundle of His and with frequent changes in the idio-ventricular electrical complexes.

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Electrocardiograms were obtained at intervals from an old hemiplegic patient who was known to have complete heart-block from February 26, 1912, up to the day of his death, December 31 of the same year. During many months of this period he had pronounced Cheyne-Stokes respiration. The interest in this case lies in the fact that there were frequent changes in the electrical complexes of the ventricular beat and correlated with this the fact that histological examination revealed no organic lesion to account for the block, in the auriculo-nodal junction, the node of Tawara, or the main stem and its branches. The nodal artery was sclerotic.

The variations in the ventricular complexes were seen not only from one examination to the next, but often from beat to beat.

The waves *Q*, *R*, *S* and *T* all showed variations; for example with leads I and II the wave *R* was sometimes upright, sometimes inverted. With lead III the wave *R* was always inverted.

The auricular rate was strikingly reduced during the dyspneic period (44.49 beats per minute), as compared with its rate during apnea (94.17 beats per minute). The ventricular rate was only slightly reduced during dyspnea (30.46 beats per minute as compared with 31.25 beats per minute). In other words the vagus still had a marked chronotropic effect on the auricle and little if any on the ventricle. Two atropin tests were made during which the heartblock was not relieved; and, again, the auricular rate was decidedly increased, the ventricular rate very slightly so.

To explain the divergent types of ventricular complexes we may consider the possibility that the intrinsic ventricular pacemaker was frequently shifting, or that the different impulses

started at the same point and traveled either along different routes, or at varying rates along the same route.

Complete heart-block without anatomical lesion in the auriculo-ventricular system may possibly be of neurogenic or of circulatory origin, or it may be ascribed to chemical agents, to asphyxia, or to some hindrance to the passage of impulses from the terminal arborizations of the conducting system to the ventricular musculature.

A previous example of possible functional heart-block was reported by Dr. Alfred Cohn.[1] In his case of transient complete dissociation showing constantly varying ventricular complexes, the patient recovered, so that there was no opportunity of determining whether or not there was an organic lesion in the auriculo-ventricular system.

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Methods for the production of temporary valvular lesions.

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Experimental valvular lesions have been induced by a number of investigators—stenoses by tightening of ligatures or clamps about the valvular orifices, insufficiencies by tearing of valves with sounds and glass rods or by cutting with specially constructed valvulotomes. Such experimental stenoses may, if desired, be temporary, and normal circulatory conditions may be subsequently reëstablished. Experimental insufficiencies such as have been described, must, owing to the traumatic nature of the lesion, be permanent. As no method for the production of temporary insufficiencies has apparently been described, the following method, which also permits a study of the intraventricular pressure changes, was devised.

Method.—A curved metal catheter (22 cm. long, internal diameter 6 mm.) having toward the tip one or two openings (6 mm. in diameter) and three centimeters from the tip a longi-

[1] Cohn, PROC. SOC. FOR EXPER. BIOL. AND MED., Vol. IX, No. 2, p. 24, December, 1911.