

SCIENTIFIC PROCEEDINGS.

ABSTRACTS OF COMMUNICATIONS.

Fifty-eighth meeting.

University and Bellevue Hospital Medical College, April 15, 1914.

Vice-President Gies in the chair.

65 (882)

The influence of the diaphragm descent on the movements of the heart.

By **CARL J. WIGGERS.**

[From the Physiological Laboratory of Cornell University Medical College, New York City.]

If the upper three fourths of the sternum, together with the corresponding ribs are resected, so that the heart remains intact within the pericardium attached to the diaphragm and, in addition, the severed sterno-pericardial bands are fastened to a wire substituted for the sternum, the movements of the heart correspond to those within the closed chest. The base descends, the apex rotates anteriorly and in so doing moves downward slightly. In such experiments the effect of diaphragm descent may be produced by discontinuing artificial respiration with the lungs in a state of partial inflation, in which event the animal resumes natural breathing. The phrenic nerves may also be stimulated during periods of apnea vera.

By attaching strings to four or five separate points of the heart, large vessels and diaphragm and connecting them to receiving tambours which in turn transmitted their pulsations to recording tambours, it was possible to determine the effect of diaphragmatic traction graphically. The following observations were made.

1. During descent of the diaphragm, the posterior portions of the heart and the venæ cavæ descend more than the anterior portion of the base, while the anterior aspects of the apex move forward and as a result often slightly upward. The right and left borders of the ventricle move toward the right.

2. The movement of the heart to the right does not occur after severing the left phrenic nerves nor upon stimulating the right phrenic nerve. It is, therefore, due to a traction of the left sheath of the pericardium.

3. A descent of the base of the ventricles, the auricles and venæ cavæ occurs after the entire pericardium is severed from the diaphragm. Direct experiments show that this is due in part to a traction upon the inferior vena cava making it larger and narrower.

4. The descent of the base of the heart persists after the vena cava is clamped and divided. This results from a traction upon the ligamentum pulmonale (a double fold continuous with the pleura pulmonalis, and passing downward from the root of the lung to its vertebral and diaphragmatic attachments) which causes the roots of the lungs, the pulmonary vessels and through these the base of the heart to move downwards.

66 (883)

Experiments dealing with the relation of the sinus node to the effects of stimulation of the vagus nerves.

By ALFRED E. COHN.

[From the Hospital of the Rockefeller Institute for Medical Research, New York.]

Experiments by a number of investigators on the sino-auricular node have warranted the conclusion that this structure is responsible for stimulus production and the maintenance of the rate of the heart. Flack thought that this node formed a station in the pathway, both of the vagus and of the accelerator nerves, and that through its agency they exercised their influence on the heart. He attempted to show that exclusion of the node from function consequently interrupted impulses passing over the nerves.