

Simultaneous Electrograms and Myograms from Isolated Intestinal Segment in Unanaesthetized Dog.

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In a series of dogs, segments of the small intestine 5 to 10 cm. in length were isolated from the remainder of the intestinal tract and transplanted onto the surface of the abdomen. These segments were taken from various portions of the bowel between the upper duodenum and terminal ileum. Continuity of the remainder of the intestinal tract was re-established. When the animals had completely recovered from the operative trauma electrograms were made of the isolated segments. Two electrodes were placed at varying distances apart on the longitudinal axis of the bowel segment and were connected with a string galvanometer. The electrograms obtained were constant in their rate for given segments and reveal some rather characteristic phases. The electrograms persisted after the segment had been completely separated from the central nervous system. They also persisted, although with slight changes in certain phases, whether the segment was visibly active or quiet. This has been discussed more fully elsewhere.¹

Four dogs have been studied to determine the relationship of respiration and of mechanical activity of the bowel segment to the electrogram. Platinum wire electrodes covered with cotton and saturated with normal saline solution were used. The string of the galvanometer was relatively loose, deflecting 2 cm. per millivolt. A pneumograph was so arranged as to record respiratory movements simultaneously with electrograms on the same film. These showed that there was no relationship between respiration and the electrical complexes obtained from the isolated bowel. (Fig. 1.) Balloons were then inserted into the isolated bowel segments and connected to record contractions of the bowel on the same film with the electrogram. A very small balloon was used and the electrodes were placed on the surface of the bowel directly over it. There was a constant and definite relationship between the mechanical and electrical records. (Fig. 2.) The myogram showed the contraction to begin a brief time after the sharp negative and positive deflection phases of the complex and to correspond to the prolonged

¹ Puestow, C. B., *Arch. Surg.*, 1932, **24**, 565.

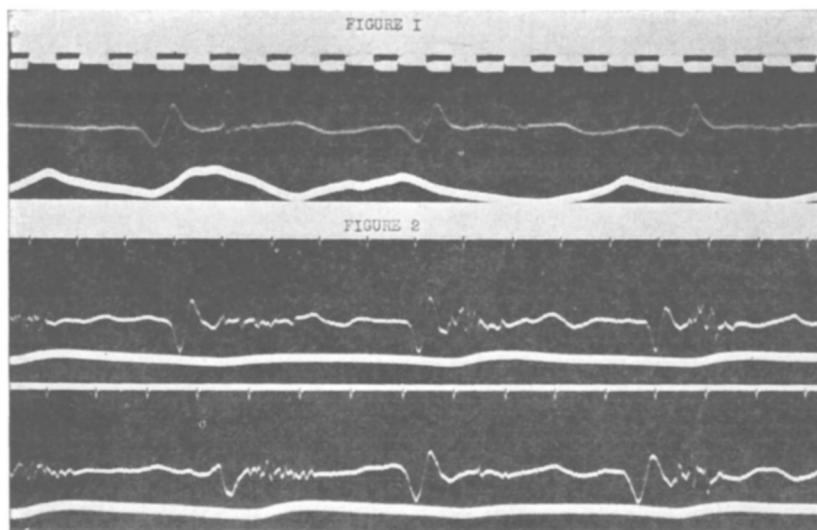


FIG. 1. Simultaneous electrogram of isolated intestinal segment and pneumogram of respiration.

FIG. 2. Simultaneous electrogram and myogram of isolated intestinal segment. Time interval—one second.

phase which shows considerable fluctuation when there is visible activity of the segment. The myograms always were simultaneous with the same phases of the electrogram. Richter² obtained electrogastrograms which consisted of 3 to 4 definite phases. He likewise obtained a negative and positive quick phase which precedes the contraction wave and a slow phase which coincides fairly closely with the contraction wave.

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Gastrectomy in the Rat.

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Removal of the stomach necessitates anastomosis of esophagus to duodenum; this is made difficult in the dog by the shortness of the abdominal part of the esophagus. In the rodent this part is much longer. It therefore occurred to one of us that such an operation

² Richter, Curt P., *Am. J. Physiol.*, 1924, **67**, 612.

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