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A Study of the Cardia in Unanesthetized Dogs.*

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Gastric and œsophageal fistulæ have been made in 15 dogs for the purpose of studying the activity of the cardia and stomach following stimulation of the œsophagus. For recording changes in tonus a small balloon about 3 cm. long containing rubber sponge with a diameter of 0.5 to 1 cm. was used in the cardia and a large balloon in the stomach. The balloon in the cardia was attached to a fairly rigid tube such that it could be held in place by the hand. It was attached to a tambour and the stomach balloon to a chloroform manometer for recording. A third balloon was placed in the œsophageal fistula well above the cardia. When a stimulus was desired the operator blew into the tube to this balloon distending it. It thus acted as a lodged bolus that could be called into play and allowed to disappear at will. Dogs were trained to lie quietly while tracings were being taken and no anesthesia was used.

Fig. 1 shows the response following distension of the upper bal-

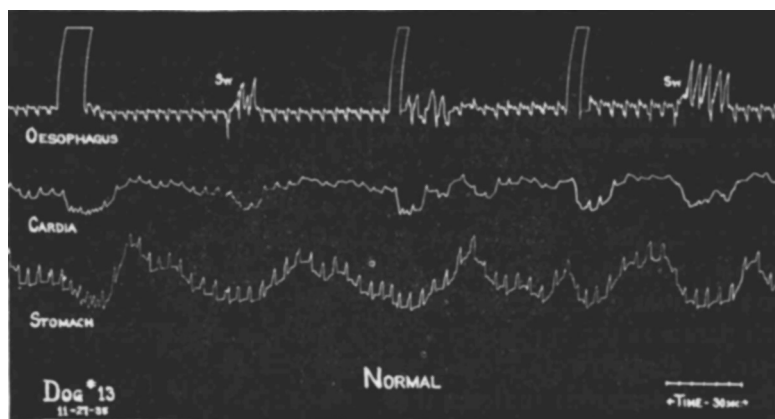


FIG. 1.

Upper tracing from balloon in œsophagus. Effect of distending this upon cardia and stomach shown. "sw", effect of swallowing.

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loon in the œsophagus in an animal without nerve section. A relaxation of the cardia and cardiac portion of the stomach (receptive relaxation) takes place immediately. Cutting one vagus did not alter this inhibitory response in the cardia and stomach. In 3 dogs section of both vagi above the diaphragm failed to produce any recognizable spasm of the cardia nor did it cause a material alteration in the inhibition seen in the cardia and stomach following distension of the œsophagus. The response was not affected in 3 dogs with splanchnics cut. Two dogs have had both vagi cut (above the diaphragm) and splanchnics cut. Fig. 2 shows the re-

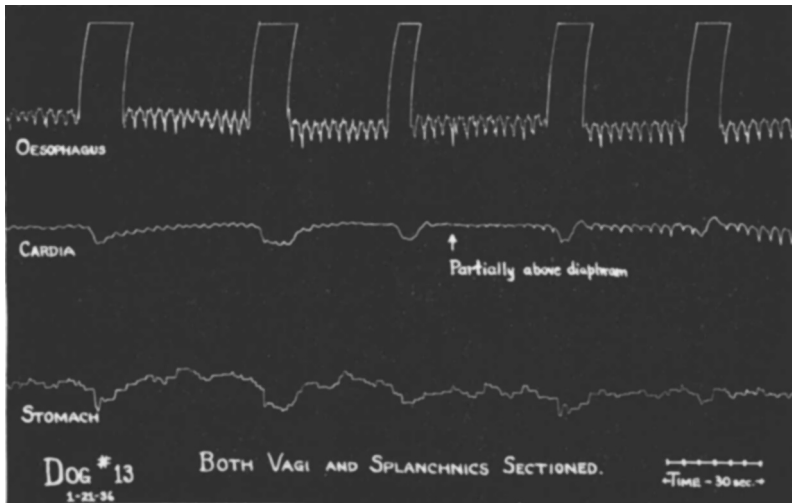


FIG. 2.

Effect upon this receptive relaxation of sectioning the vagi and splanchnics. The effect upon the tracing of gradually raising the cardia balloon is shown.

sponse in one of these animals. Both animals retained the momentary inhibitory reflex on the cardia and stomach following distension of the œsophagus. This relaxation does not depend upon the initiation of a secondary peristaltic wave in the œsophagus which passes to the cardia but may be brought about by a stimulus not strong enough to produce a peristaltic wave.

These observations indicate that relaxation of the cardia and cardiac portion of the stomach following a peristaltic wave of the œsophagus is not dependent upon extrinsic nerves.