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Accessory Regulatory Mechanism of Respiration.*

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The investigations of Heymans,¹ Schmidt,² Cromer and Ivy³ and others have emphasized the importance of the nervous control of respiration. We wish to report the effects on respiration of denervating the sensory end organs in the aorta, carotid sinus and lungs.

In brief, in 25 dogs, under moderate morphine-barbital anesthesia, in which the region of the carotid sinuses was denervated, respiratory death occurred in 10 either immediately or within a few minutes. Eleven of the remaining 15 dogs died following section of the vagi near the jugular foramen. Similar deaths were obtained in 1 of the 2 rabbits and the 2 cats used. Of 4 dogs under ether anesthesia, 1 under moderate anesthesia died following denervation of the carotid sinus regions and vagotomy. The other 3, under light anesthesia, survived the procedure. Five of the 29 animals under barbital anesthesia also survived both procedures. However, in all the animals that survived a prolonged apnea was obtained.

These results suggested that the effect of denervation depends on the sensitivity of the respiratory center. The following observation strengthened this impression: a dog under moderate morphine-barbital anesthesia, after sectioning of the vagi and denervation of carotid sinus regions, developed protracted apnea accompanied by the usual drop in blood pressure. Immediately after apnea appeared, the tracheal cannula was connected with a spirometer containing 10% CO₂. Manual compression of the chest 3 times, one minute after the occurrence of apnea (so as to force the 10% CO₂-air mixture into the lung alveoli) caused an immediate resumption of breathing and restoration of blood pressure to its previous level. This state continued after ordinary air was substituted for the CO₂ rich mixture. The resumption of breathing in this case was not due to the manual compression because this procedure was tried with ordinary air without effect in many of the other dogs that died.

* Aided by the Emil and Fanny Wedeles Fund of the Michael Reese Hospital for the Study of Diseases of the Heart and Circulation.

¹ Heymans, C., Bouckaert, J. J., and Dautrebande, L., *Pflüger's Arch. f. d. gesamte Physiol.*, 1932, **230**, 283.

² Schmidt, C. F., *Am. J. Phys.*, 1932, **102**, 94.

³ Cromer, S. P., and Ivy, A. C., *Proc. Soc. Exp. Biol. and Med.*, 1931, **28**, 565.

These results indicate that the respiratory center is under the tonic control of the end organs of the carotid sinus region and of the aortic region, as well as those located in the lungs. These results suggest, furthermore, that this tonic activity is particularly important when the respiratory center is in a depressed state and also that the removal of this tonic influence at such a time may lead to respiratory death.

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Experimental Spontaneous Peptic Ulcer.

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In this work physiological processes other than the occurrence of peptic ulcer were being studied after jejuno-colostomy. A resulting and unexpected high incidence of peptic ulcer, however, has led to a study of this condition. All operations were performed on healthy adult dogs under morphine-ether anesthesia, using aseptic technique. Through a right paramedian incision the jejunum was isolated and sectioned approximately 25 to 30 cm. distal to the ligament of Treitz. Both ends were inverted. A side-to-side anastomosis was then made between the proximal jejunal stump and the caecum or ascending colon. At no time during the procedure was the stomach, duodenum or upper abdomen handled or explored, thus eliminating the element of trauma. The abdomen was closed. For 3 days after operation the animals were given intravenous saline only. Fluids and solid food were then given by mouth in gradually increasing amounts, until they were receiving the regular stock diet.

Seven dogs have died at intervals, longer than 8 days after operation. In 6 of these 7 animals, autopsy revealed on gross examination acute to more chronic forms of peptic ulcers. In one dog autopsied 8½ days after operation an acute gastric ulcer, 2x2 mm., with destruction of the mucosa was found 4 cm. proximal to the pylorus. Two other animals, having died 14 and 27 days after operation, showed gastric ulcers in the pre-pyloric region. The first was an acute ulceration of the mucosa with rounded margins, measuring 2x2 mm., and the other was a large ulcer 1x0.6 cm., having indurated and rolled margins and penetrating deeply into the stom-