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Mechanism of Secretin Diuresis.

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Owen and Ivy have shown that the intravenous injection of concentrated vasodilatin-free secretin preparations into dogs results in a typical moderate diuresis. Certain characteristics of the diuresis led us to suspect that it was related to, and probably dependent upon the secretory stimulation of pancreatic juice and bile. The following experiments give evidence that this is the case. Following pancreatectomy and ligation of the common bile duct, previously active preparations are without effect on the rate of urine flow. Secretin preparations cause no diuresis if the bile and pancreatic juice resulting from their injection are diverted from the intestine by cannulae. Reintroduction of the collected bile and pancreatic juice into the intestine is followed by the typical diuresis. Diuresis in the intact dog is therefore dependent on the secretion of pancreatic juice and bile, and the entrance of these secretions into the intestine where they may be reabsorbed. It may be noted that in the experiments in which Mellanby¹ reported that secretin had no diuretic effect, the pancreatic juice and bile were simultaneously collected by means of cannulae so that they could not enter the intestine.

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Physiological Effects of Denervating the Carotid Sinus in Dogs.

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The carotid sinus is the seat of reflexes controlling heart rate, blood pressure and respiration. This fact was first demonstrated in acute experiments by H. E. Hering,¹ and has been amply verified

¹ Mellanby, J., *J. Physiol.*, 1929, **66**, 1.

¹ Hering, H. E., *The Carotid Sinus Reflex on Heart and Blood Vessels*, 1927, Verlag von Theodor Steinkopff (Dresden and Leipzig).

by Heymans,² Danielopolu,³ De Castro,⁴ and by one of us (Cromer). The following work was undertaken to study the effects of exercise before and after denervating the carotid sinus to ascertain how vital is the rôle played by the carotid sinus mechanism.

Method. Dogs were trained so that heart rate, blood pressure and respiration rate could be determined under basal conditions. After 2½ or three minutes of vigorous exercise, readings were again taken. After a number of control observations had been made over a period of several weeks, the dogs were operated aseptically and the carotid sinus nerve, or Hering's nerve, and the carotid glomerulus and plexus were removed and the carotid sinus region was painted with phenol bilaterally.

Beginning on the day following the operation and thereafter for from 2 to 8 weeks, heart rate, blood pressure and respiration rate were followed before and after exercise.

The accompanying table gives the average results on 5 dogs. The results on the individual dogs compare closely with the results shown in the table.

TABLE I.
Observations Before and After Denervating Carotid Sinus in Dogs. Average
5 Dogs.

Heart Rate		Blood Pressure		Respiration		Exercise
Before Exercise	After Exercise	Before Exercise	After Exercise	Before Exercise	After Exercise	
61	122.7	138/79	172/109	18.5	65.5	
	97		149/92		76	5 min. later
	86		144/88		66	10 " "
	73		136/82		59	15 " "
After Operation for Denervation of Carotid Sinuses.						
64.7	134.4	130/82	173/113	17	59	
	102		151/95		44	5 min. later
	91		137/88		53	10 " "
	82		132/83		31	15 " "

The slight variation in the data obtained before and after denervation of sinuses indicates that the physiological rôle of the carotid sinus as a reflexogenic center for controlling blood pressure, heart rate and respiration is readily taken over by other mechanisms in the dogs.

² Heymans, C., *The Carotid Sinus and Other Reflexogenic Vaso-sensory Zones*, 1929, London, H. K. Lewis and Co.

³ Danielopolu, D., and Proca, G., *Arch. Mal. du Coeur*, 1929, 769.

⁴ De Castro, F., *Trav. lab. rech. biol. Inst. Cajal*, 1926, **24**, 365; 1928, **25**, 331.