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The cardio-inhibitory fibers in the woodchuck (Marmotta monax).

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In mammals the trunk of the vagus in the cervical part of its course, where it is most conveniently exposed and stimulated, is composed of afferent and efferent fibers intimately intermixed. Afferent fibers come from the pharynx, œsophagus, stomach and other abdominal viscera, larynx, trachea, bronchi and pulmonary tissue, and heart; and efferent fibers pass to the voluntary muscles of the soft palate, pharynx, larynx, to the non-striped muscle of the œsophagus, stomach and intestine, and of the trachea, bronchi and their divisions in the lungs, and to the heart.

In studying the functions of the afferent and efferent cardiac fibers by division and excitation, these cannot be separated from each other, nor from the afferent and efferent fibers belonging to other organs, except in the case of the rabbit where the depressor nerve containing the afferent cardiac fibers exists as a separate branch which can be isolated and stimulated alone.

In the woodchuck or American marmot (*Marmotta monax*) we find that the cervical part of the vagus consists of two or three distinct fasciculi which can be readily isolated in the living anæsthetised animal without injury, and stimulated individually. On ligaturing and dividing each of these strands, and stimulating the peripheral and central ends, we find that one of them alone contains cardio-inhibitory fibers. Upwards this can be followed as a distinct fasciculus to the superficial origin of the vagus nerve from the medulla oblongata, but in the lower part of the neck it appears to unite with the other bundles to form a common trunk and cannot be easily dissociated. Whether it contains afferent fibers, or efferent fibers to other organs than the heart, at the present moment we are not prepared to say, but if on further investigation we find that it consists of cardio-inhibitory fibers alone, then by tearing out the fasciculus at its point of exit from

the skull, and pursuing its course centrally by means of the method of indirect Wallerian degeneration employed by van Gehuchten, we shall be enabled to locate anatomically the cardio-inhibitory center in the medulla oblongata.

All that we feel justified in saying in the present preliminary communication, however, is that in the woodchuck one of the bundles into which the vagus nerve can be separated in the cervical region contains cardio-inhibitory fibers, while the others do not. This is unique, so far as we know, and may correspond on the efferent side to the case of the depressor nerve in the rabbit on the afferent side.

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The relation between bile-secretion and bile-pressure.

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In the course of our work on the pressure of bile secretion in different animals, Herring and the author[1] found that in some cases the rate of bile flow was greater after the pressure was removed than it had been at the beginning of the experiment. The cystic duct having been clamped, a cannula was tied into the common bile duct and connected by means of rubber tubing to a drop recorder which marked the rate of bile flow on a slowly moving drum. A vertical glass tube mounted on a millimeter scale was introduced by means of a T-piece between the bile duct and the drop-recorder, so that by closing the exit to the drop-recorder the pressure of the secretion could be observed in terms of a column of bile.

In the course of some observations which I have since been making on bile pressure in the sheep, using the same method, I have observed on several occasions that after the bile had risen to its maximum height in the manometer, when the clamp was removed from the outflow tube the rate of flow was much greater than it had been before the pressure began to be recorded and that this increased rate of flow was maintained for a considerable time.

[1]*Proceedings of the Royal Society*, B, Vol. 79, 1907, p. 517.