

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 author¹ 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.

One explanation of this might be that while the pressure was rising in the manometer the liver was being distended with bile and when the pressure, which was the cause of this distension, was removed the elasticity of the liver tissue led mechanically to the increased expulsion of bile. To test the correctness of this explanation, I killed one animal with an overdose of chloroform when the bile pressure had attained its maximum and at the same time released the clamp obstructing the outflow. In this case the increased rate due to the escape of the bile from the gorged liver very quickly diminished and the flow soon stopped entirely. The cause is, therefore, probably not merely mechanical.

To investigate this matter further, the escape of bile was adjusted so that a certain pressure (170 mm. bile) could be maintained in the manometer while the bile-flow was being registered by the drop-recorder, and in two cases—one sheep and one dog—it was found that the rate of bile-flow was greater than when the bile column stood at zero. At this pressure it is certain that a considerable quantity of bile was passing backwards and being adsorbed into the lymphatics so that the flow through the common bile duct did not account for all the bile that was being secreted. It is right to mention, however, that I observed this in only two experiments out of about twenty.

The most obvious explanation of this phenomenon which suggests itself to me is that the passage of bile through the lymphatics into the blood stimulates the liver cells to increased activity so that more bile is actually secreted. This is all the more probable since we know that the intravenous injection of a small quantity of bile or bile salts acts as a powerful cholagogue. In jaundice by obstruction it would appear therefore, that in the initial stages at all events, a kind of vicious circle is established whereby the bile absorbed stimulates the hepatic cells to produce more bile. This increased activity, which has for its object, no doubt, the removal of some obstruction in the bile passages, will at some stage be arrested, and may give place to partial or complete loss of function.