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#### DISCUSSION

DR. JAMES C. DRYE: As a general surgeon I feel somewhat impertinent in discussing a paper in the neurological field. However, I have had some experience in perfusing dogs' brains. I got into this as a preliminary part of a study on gastric secretion. I was interested in the effect of hypoglycemia on secretion—did it act directly on vagal nuclei, or was the hypoglycemia effect due to the effect on the whole dog, particularly the adrenals? We attempted to keep the dogs' brains at a normal level of glucose concentration while putting the rest of the dog into insulin shock. We gave large doses of insulin and then perfused glucose into the carotid artery and drew samples of blood from the femoral vein, from the jugular vein, for glucose determinations. After running a number of dogs, we became aware of many difficulties. Under nembutal anesthesia we were able to produce a nice differential between jugular vein fluid and femoral vein blood as far as glucose concentrations went, but the nembutal stopped all gastric secretion. Under other anesthetic agents, such as ether cyclopropane, nitrous oxide with morphine, etc., we were unable to produce any hypoglycemia.

During the course of these studies we happened to dissect out the carotid artery and jugular veins. To our surprise we found that the carotid

artery broken into a small number of small twigs at the foramen, and supplied the brain hardly at all, but chiefly the skin and the muscles of the face and jaws. Apparently the dog's brain is supplied chiefly by the vertebral and spinal arteries. In the dog the internal jugular vein seems to empty immediately into the external jugular as it leaves the brain, so that samples taken out of the neck are of venous blood, partly from the brain but mostly from the jaws and face.

I just do not understand Dr. Woodhall's observation. He was perfusing the carotids which do not supply the brain. I am not clear as to how he was measuring the brain temperature. If he were taking temperatures from the venous blood, he was not getting anything related to the brain, as most of this blood comes from the exterior of the skull. I am just a little confused about this paper.

DR. BARNES WOODHALL: (closing) I am aware that the carotid artery of the dog supplies other head structures as well as the brain, and that the brain further obtains its blood supply from the vertebral arteries and the spinal artery. These are demonstrated facts, however, that perfusion of the carotid artery with cooled, oxygenated blood lowers brain temperature, abolishes cerebral electroactivity and reduces the AVO differences of the perfusate to zero at 21 to 20° C.