# SOME OBSERVATIONS ON THE SYMPATHETIC NERVOUS SYSTEM.

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(*Abstract.*)

OUTLINE of physiology of sympathetic nervous system and its effect on the cerebral blood-vessels. Other factors controlling cerebral blood-vessels, such as local intra-arterial pressure and gas tension. The action of adrenalin-like and cholin-like substances on the cerebral blood-vessels. Alteration in cerebral blood flow during a convulsion, and the accompanying changes in cerebro-spinal fluid pressure. Evidence for systemic sympathetic disturbance during a convulsion. Discussion of "vaso-vagal" attacks and "diencephalitic" epilepsy.

## Discussion.

Dr. PICKWORTH asked, *firstly*, if the increase which was shown in blood-flow from the brain during an epileptic fit was not due to carbon dioxide reaching the brain from the muscular effects of the fit. This question was necessary because the graphs of this were calibrated in minutes instead of the usual seconds. Dr. Carmichael had also shown, by means of another important and clear graph, an extremely rapid response of the brain volume to a single breath of carbon dioxide.

*Secondly*, he would ask whether the time lag of the finger volume increase, as shown in the first picture, of about four seconds after the cerebro-spinal fluid pressure increase, supported the dilatatory effect of seventh nerve stimulation upon the cerebral vessels, rather than its absence, as Dr. Carmichael had inferred.

*Thirdly*, the mechanism of action of the vasoconstrictor nerves, and of reaction to carbon dioxide took place in two anatomically distinct structures, the arterioles and capillaries respectively. Because a slight general increase in blood-flow was shown, it was not safe to assume there had been no vasoconstriction of the capillaries, since the site of greatest impedence to blood-flow was normally in the capillaries—where the blood corpuscles were even subjected to moulding—and not in the arterioles, where the size of the corpuscle was much less than that of the arteriolar lumen. A lessening of cerebral capillary resistance to flow would therefore cause a total increase in flow irrespective of normal changes in the arterioles.

Dr. CARMICHAEL, in reply, said Dr. Pickworth had raised some problems which it was difficult to answer in a moment. He would like to suggest that the observations which he had put forward were in reference to the total blood-flow and not necessarily to the blood-flow in isolated parts of the brain. No experimental evidence could be brought forward to suggest that blood-flow in one part of the brain was changing in regard to another.

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