Conclusions: The ratio of bromide in blood and spinal fluid is changed after fever. This hyperpyrexia must be greater than 103° F., continued at least 30 minutes and be repeated at least 5 successive days. The permeability quotient (P. Q.) in all cases was lowered, showing increased permeability. The maximum lowering was a P. Q. of 1.6; the least result was *2.7.* A lower temperature than 103° F. or one continued for less than 5 days produced uncertain results.

The above results indicate that a hyperpyrexia produced by hot baths is capable of lowering the permeability quotient in the same manner as does the malarial fever.

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Presence of Afferent Nerve Fibers in Meningeal Blood Vessel Walls.

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The presence of vasomotor nerves in the cerebral blood vessels seems well established as a result of the work of Nothnagel,[1] Wiggers,[2] Brown,[3] Anrep and Starling,[4] and Forbes and Wolff.[5] Anatomical studies, particularly by Alexander,[6] Gulland,[7] Huber,[8] Hunter,[9] Traum,[10] and Stohr,[11] have suggested the presence of sensory nerve-endings in the pial blood vessel walls. We have been unable to find any physiological work on these supposed afferent nerve-endings.

In connection with a series of dogs, in which dilatation of the

[1] Nothnagel, H., *Virchow's Arch.*, 1867, xl, 203.

[2] Wiggers, C. J., *Am. J. Physiol.*, 1907, xx, 206.

[3] Brown, E. D., *J. Pharm. Ex. Therap.*, 1916, xiii, 185.

[4] Anrep, G. V., and Starling, E. H., *Proc. Roy. Soc. Biol. Sci.*, 1924-25, xcvii, 463.

[5] Forbes, H. S., and Wolff, H. G., *Arch. Neurol. Psych.*, 1928, xix, 1057.

[6] Alexander, W. T., *Arch. f. Mikrosc. Anat.*, 1875, xi, 231.

[7] Gulland, L., *Brit. Med. J.*, 1898, ii, 781.

[8] Huber, C. C., *J. Comp. Neur.*, 1899, ix, 1.

[9] Hunter, W., *J. Phys.*, 1900-01, xxvi, 465.

[10] Traum, E., *Zeit. f. Anat. u. Entwick.*, 1925, lxxvii, 488.

[11] Stohr, P., *Zeit. f. Anat. u. Entwick.*, 1922, lxiv, 555.

pial blood vessels was studied, as previously reported,[12] we made a number of observations on reflex stimulation of respiration and blood pressure following electrical stimuli applied to the meningeal vessels and directly to the dura. As controls, we used the same strength of faradic current to obtain reflex effects from the stimulation of the femoral blood vessels. We varied the procedure considerably in order to avoid unfair conclusions with regard to the relative sensitivity of these various areas. In these experiments the depth of anesthesia must be maintained the same throughout. Furthermore, we noted that pressure variations in the application of the electrodes would cause variations in the reactions, and that, under some circumstances, cauterization might occur. Great care was necessary to avoid these complications. We considered as significant, changes beyond 8 per minute in respiratory or heart rate, and greater than 6 mm. of mercury in the mean blood pressure.

We found that electrical stimulation applied to the blood vessels of the dura mater or pia mater caused a greater effect than the same strength of current applied directly to the meningeal surfaces between blood-vessels. Surgeons operating on the brain under local anesthesia, but without the meninges anesthetized, have noted in cutting the meninges that pain is felt chiefly when the meningeal vessels are cut, or traumatized.[13]

Stimulation of the pial and dural vessels usually caused a significant decrease in respiratory rate. Stimulation of the femoral vessels, however, usually resulted in a significant fall in blood pressure without any marked effect on the pulse rate. There was decreased sensitivity to the electrical stimulation in all the vessels tested, the longer the experiment was continued.

The results were not clear-cut enough to be definitely conclusive but they are worth reporting in the effort to call attention to the need of further experimentation in this field. The presence of sensory nerve fibers in the meningeal blood vessels offers an explanation of headaches occurring with presumed pressure changes in the cerebral blood vessels.

[12] Leake, C. D., Hitz, J. B., and Kammer, A. G., *J. Pharm. Ex. Therap.*, in press; Leake, C. D., Loevenhart, A. S., and Muehlberger, C. W., *J. Am. Med. Assn.*, 1927, lxxxviii, 1076.

[13] Independent personal communications from Dr. A. S. Crawford and Dr. H. Cushing. Dr. H. Naffzigger agrees with this observation only with reservations.