

case all the manifestations are to be explained by the one left sided focus, which must certainly be present, or whether possible a second focus must be assumed on the right side which only irritated the vegetative pathways for the trunk and extremities can certainly not be decided. We consider the first assumption to be the more probable. From literature pertaining to the writer's case, as well as to an unpublished case of Dr. Pappenheim's we come to the following conclusion in regard to the central fiber course of the vegetative pathways, especially in regard to their crossing.

1. In man the vegetative pathways from the cerebrum continue downwards through a crossing.

2. The crossing has been followed to the lowest sections of the cervical spinal cord.

3. The crossing for the path for the eye sympathetic and the vasomotor and sweat pathways of the face may be traced between the inner capsule and the pons.

4. The crossing of the vasomotor and sweat gland pathways of trunk and extremities seem to be situated in the upper sections of the medulla oblongata. [Author's abstract.]

Boeke, J., and Dusser de Barenne, J. G. THE SYMPATHETIC INNERVATION OF THE CROSS-STRIATED MUSCLE FIBERS OF VERTEBRATES. [Proc. Koninkl. Akad. v. Wetenschappen te Amsterdam, 1919, xxi, 1227 (2 figs).]

Some years ago Boeke showed that on the cross-striated muscle fibers of reptiles, birds and mammals there existed, besides the usual motor end-plates, a second set of hypolemmal nervous end-organs, very fine and delicate, which are seen in Bielschowsky preparations as very small neurofibrillar end-rings and small end-nets, lying on the surface of the muscle fibers at the end of fine non-medullated nerve-filaments. These so-called "accessory" nerve-endings lie hypolemmally on the muscle fibers embedded in the granular sarcoplasm of the fiber, and in some cases are found in the same layer of granular protoplasm which surrounds also the terminal ramifications of the common motor end-organ; in other cases they are found as separate endings, lying embedded in a distinct layer of nucleated sarcoplasm independent of the motor sole, but, as far as could be made out, they always appear as hypodermal structures. The non-medullated nerves that have these end-organs attached to their terminal nerve-ramifications, are seen running in bundles between the muscle-fibers, remain amyelinic throughout their whole course, and seem to form a distinct system of nerve-fibers, independent of the motor and the sensory nerves. These facts suggested the sympathetic nature of these nerve-fibers, but it was concluded that the cross-striated muscle-fibers are innervated both by the spinal nerves and the sympathetic system. The end-organs just mentioned were found in

the muscles of the tongue, eye, iris, back, pectoral and intercostals, and the diaphragm. The sympathetic nature of these "accessory" fibers was shown by section of the trochlearis and oculomotorius directly after they have left the mid-brain: while the motor and the sensory fibers of these two nerves degenerated, the accessory non-medullated nerve-fibers and their end-organs on the muscle-fibers remained unaltered; they must therefore come from the carotid plexus by the sympathetic branch. Similar results have been now obtained in the cat's intercostal muscles a month after extirpation of the sixth to the ninth thoracic spinal ganglia together with simultaneous section of the sixth to the ninth thoracic ventral and dorsal roots. Bielschowsky preparations of the intercostal muscles of the seventh intercostal space showed complete degeneration of all the medullated fibers, both motor and sensory, with perfect preservation of the "accessory" non-medullated fibers with their peripheral terminations in the muscle. The writers conclude, therefore, that the accessory fibers and their end-organs, for the muscles of the trunk at any rate, belong to the sympathetic system, and transmit centrifugal, efferent nerve-impulses. [Leonard J. Kidd, London, England.]

Agduhr, E. THE SYMPATHETIC INNERVATION OF THE CROSS-STRIATED MUSCLE-FIBERS OF THE EXTREMITIES. [Proc. Koninkl. v. Wetenschappen te Amsterdam, 1919, xxi, 1231 (4 figs.).]

All the spinal nerves, whose ventral ramifications form the brachial plexus of cats, were divided between the spinal ganglion and the point of exit of the white ramus communicans; histological examination from five to ten days after operation. In sections of the interossei muscles—prepared by Agduhr's modification of Bielschowsky's method—from the anterior extremity of the operated side, he found that all the medullated nerve-fibers were degenerated, but that there were fairly numerous intact non-medullated nerve-fibers; these intact fibers are interpreted as postganglionic sympathetic fibers. Thus, the striped muscles of the cat's extremities are innervated by sympathetic fibers, as Boeke showed to be the case in the cat's superior oblique eye-muscle. These sympathetic nerves in the extremities terminate in comparatively simple loop-formations, partly on ordinary cross-striped muscle fibers and partly on muscle fibers in the muscle spindles. Agduhr has reason to believe that the large majority of these sympathetic terminal plates—both on ordinary muscle fibers and on those of the muscle spindles—are situated hypolemmally, just as Boeke described them in the cat's superior oblique muscle. But other preparations of Agduhr's show that there are also epilemmally situated sympathetic terminal plates in the extremity-musculature. Most of the sympathetic terminal plates on ordinary striped muscle fibers lie outside the region of extension of the motor plates, but many are situated within it. [Leonard J. Kidd, London, England.]