

8951 C

Sequence of Medullation of Peripheral Nerves.

DONALD H. BARRON. (Introduced by J. S. Nicholas.)

From the Department of Anatomy, Cambridge University, Cambridge, England.

Though the literature contains many accounts of the order in which tracts of the central nervous system acquire their medullary sheaths, Anderson's¹ study of the medullation of the sympathetic system appears to be the only record of observations on the order in which peripheral nerves acquire their sheaths. Stimulated by these observations, a study has been made of the sequence in which systems of fibres in the somatic as well as in the visceral nerves become myelinated in the kitten.

The peripheral nerves of fetal kittens ranging between 8 cm. snout-rump length and full term (c.a. 14 cm.) have been examined either by teasing them out in glycerine after staining for 12 hours in 1% osmic acid, or by sectioning in paraffin, following treatment by the Weigert technic.

The following summary presents the more significant findings in the specimens examined, grouped according to their lengths:

Fetuses 8.0 cm. No medullation was found in any of the peripheral nerves.

Fetuses 9.5 cm. (a) Phrenic nerve contained about 35 faintly medullated fibres. (b) Vagus contained about 12 medullated fibres in the middle of the neck. (c) A few medullated fibres were found in the spinal portion of the eleventh. (d) Medullated fibres were present in all the cervical and dorsal anterior roots. (e) Posterior roots of the cervical segments were medullated only near the ganglion. No medullation was observed on the more caudal dorsal roots.

Fetuses 10.5 cm. (a) The third, fourth, sixth and twelfth nerves contain a few medullated fibres. (b) Medullated fibres were found in both the motor and sensory roots of the trigeminal. (c) None of the fibres of the posterior roots are medullated to their entrance into the cord.

Fetuses 11.5 cm. (a) The phrenic nerve was medullated close to the diaphragm. (b) All of the medullated fibres of the vagus could be traced into the recurrent laryngeal nerve. (c) There was a definite increase in the number of medullated fibres in the nerves which had acquired sheaths earlier.

¹ Anderson, H. K., Thesis for M.D. degree, Cambridge, 1898.

Fetuses 12.5 cm. (a) Nerves to the sinus hairs were faintly medullated. (b) The fibres in the mesentery were faintly medullated to their entrance into the Pacinian corpuscles. (c) The fibres of the tendon organs were medullated. (d) Medullated fibres were present in the superior laryngeal nerve. (e) The articular nerve of the knee contained 22 medullated fibres.

Fetuses 13.5 cm. (a) There were about 15 faintly medullated fibres in the depressor nerve.

New born. (a) No medullated fibres were found in the papillae of the tongue. (b) Medullated fibres appeared in the pad of the foot but did not reach the epidermis. (c) Medullated fibres reach the necks of the sweat glands but none can be found in the epidermis of the nose.

The phrenic appears to be the first peripheral nerve to acquire extensive medullation; the spinal accessory is next, followed by the recurrent laryngeal branch of the vagus. Of the spinal nerve roots, those of the brachial segments acquire their sheaths first and most rapidly. The sensory nerves to elaborate end-organs all appear to acquire their sheaths at the same time and earlier than the remaining sensory fibres, whose medullation is not complete until after birth.

8952 C

Further Observations on Dorsal Root Components.*

MARION H. STOREY, KENDALL B. CORBIN AND JOSEPH C. HINSEY.

From the Department of Anatomy, Stanford University, California.

Additional evidence, both anatomical and physiological, has been introduced by Barron and Matthews^{1, 2} to support the presence of efferent components in the dorsal roots. These investigators believe that their histological evidence in the cat, suggests that collaterals of fibers in the posterior funiculi pass to the periphery through the spinal ganglia without cell stations. Such collaterals are said to constitute about 32% of the fibers in the lumbosacral dorsal roots and are of the myelinated variety. The literature bearing upon this

* This investigation was conducted with the aid of the Rockefeller Foundation Grant for Fluid Research in the Medical Sciences at Stanford University.

¹ Barron, D. H., and Matthews, B. H. C., *J. Physiol.*, 1935, **85**, 73.

² Barron, D. H., and Matthews, B. H. C., *J. Physiol.*, 1935, **85**, 104.