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Experimental and Anatomical Studies on the Vagus Nerve of the Cat.

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Since Ranson and his associates^{1, 2} have demonstrated that the rootlets of the vagus nerve of the dog and the cat are of 2 anatomical types, one resembling the ventral, the other the dorsal roots of thoracic spinal nerves, it seemed desirable to ascertain whether a like differentiation exists in their intramedullary courses. The rootlets of the right vagus nerve were sectioned intracranially in 2 cats and the right nodose ganglion removed in 5 others. After 14 days each animal was killed and the brain stem and cervical cord were fixed in Müller's fluid. Later they were stained by the method of Marchi. Nearly complete series of sections of the pons and medulla oblongata were mounted.*

In such histologic preparations there are 3 types of rootlets. The majority of the degenerated myelinated fibers with cell bodies in the jugular and nodose ganglia enter the medulla by way of the upper (cephalic) rootlets, pass over or through the dorsal portion of the descending trigeminal tract and nucleus, then course dorsal to the motor fascicles of the vagus, and ultimately enter the lateral or ventral portion of the solitary bundle. Probably these coarse fascicles (accompanied by no discernible undegenerated fibers) represent an intramedullary continuation of the pure sensory type seen peripherally by Ranson. Medium sized motor bundles can be traced from the dorsal motor nucleus of the vagus, ventral to the tractus solitarius, through the middle or ventral portion of the spinal nucleus of the trigeminal nerve to the surface of the medulla. Many of these motor fibers proceed peripherally through the lower (caudal) group of rootlets. Finally, coursing with certain motor fascicles are smaller groups of degenerated fibers which leave the efferent bundles in a situation ventral to the solitary tract, turn abruptly dorsalward and enter the latter. These degenerated filaments enter the medulla in company with the upper (cephalic) motor bundles. This combi-

¹ Chase, M. R., and Ranson, S. W., *J. Comp. Neur.*, 1914, **24**, 31.

² Ranson, S. W., and Mihalik, P., *Anat. Rec.*, 1932, **54**, 355.

* The authors are indebted to Dr. S. W. Ranson for proposing this problem and for loaning the two series in which the rootlets of the vagus had been sectioned intracranially.

nation of motor and sensory fibers may represent a central continuation of extramedullary mixed rootlets. Some support for this view is obtained from the description by Chase and Ranson of a mixed type of rootlet in the peripheral vagus of the dog.

In view of Ranson's³ recent demonstration that the sensory rootlets of the first 3 cervical nerves contribute many fibers to the nucleus intermedius of the cat, and in view of DuBois'⁴ description of degenerated fibers of the vagus terminating in the nucleus intercalatus of the opossum, these 2 nuclei were carefully studied. In both types of preparations (intracranial section and nodose ganglionectomy) the majority of the myelinated sensory fibers of the vagus nerve terminate in the nuclei of the solitary tract and the commissural nucleus. None were observed to enter either the nucleus intermedius or nucleus intercalatus. In this respect our findings in the cat are in accord with those of Van Gehuchten⁵ in the rabbit and Allen⁶ in the guinea pig.

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Rôle of the Thyroid and of Iodine in Nutritional Anemia.

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The experiments here described were undertaken to ascertain whether different functional levels of the thyroid gland as induced by the administration of iodine play any part in the development or severity of the anemia produced by milk feeding.

Kunde, Green and Buno¹ have shown that hypothyroidism is accompanied by mild anemia and Drennan, Malcolm and Cox² produced thyroid hyperplasia in rats on a diet of white bread and fresh milk. This hyperplasia was easily corrected by the addition of a small amount of iodine. The iodine content of milk is low but

³ Ranson, S. W., Davenport, H. K., and Doles, E. A., *J. Comp. Neur.*, 1932, **54**, 1.

⁴ DuBois, F. S., *J. Comp. Neur.*, 1929, **47**, 189.

⁵ Van Gehuchten, A., *Le Neuraxe.*, 1900, **1**, 173.

⁶ Allen, W. F., *J. Comp. Neur.*, 1923, **35**, 171.

¹ Kunde, M. M., Green, M. F., and Buno, G., *Am. J. Physiol.*, 1932, **99**, 469.

² Drennan, A. M., Malcolm, J., and Cox, G. A., *Brit. J. Exp. Path.*, 1931, **12**, 430.