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THE SO-CALLED DORSOTRACHEALIS BRANCH OF THE SEVENTH CRANIAL NERVE IN AMPHIUMA.

BY H. W. NORRIS.

Fischer in his work on the Derotremes and Perennibranchs* describes a peculiar branch of the seventh cranial nerve in *Amphiuma*, distributed, according to his statement, to the hyotrachealis muscle. Kingsley in his recent paper on the cranial nerves of *Amphiuma*† agrees with Fischer that the nerve is one having no homologue in other Amphibians. According to him the nerve ends in the dorsotrachealis muscle. My own observations are so at variance with the views of these two writers that the following detailed account of the course of this extraordinary nerve is hereby given. Observations were made upon specimens of *Amphiuma* at different stages. A projection of the cranial nerves of a 130 mm. specimen was made by plotting of serial sections. (See accompanying illustration.) While the material had been neither preserved nor stained with a view to tracing nerve components, yet it gave results far better than was to be expected.

As Kingsley says, there emerge on the posterior surface of the hyomandibular trunk of the seventh cranial nerve four branches. The first is Jacobson's commissure, passing posteriorly and dorsally to anastomose with the glossopharyngeal nerve. The fourth branch, or hyomandibular proper, arises as two branches or as one that immediately divides into two. The second and third branches immedi-

* FISCHER, J. G.—Anatomische Abhandlungen über die Perennibranchiaten und Derotremes. Hamburg, 1864.

† KINGSLEY, J. S.—The Cranial Nerves of *Amphiuma*. Tuft's College Studies, No. 7, 1902.

ately enter the digastric muscle. According to Kingsley the dorsal one of these breaks up into smaller branches supplying this muscle, while the ventral one passes postero-ventrally through the muscle. I find that both branches give off fibers to the muscle and pass back, uniting into one trunk near the posterior border of the muscle. In passing between the muscle fasciculi both branches become much flattened and in some places difficult to follow.

From the posterior border of the muscle the nerve rapidly ascends nearly to the dorsal border of the thymus gland, along which organ it passes posteriorly, for some distance being imbedded in the dorso-lateral border of the gland. Before reaching the thymus gland the nerve divides, the two divisions reuniting shortly after the gland is reached. In some cases a second branch is given off shortly before the first branch unites with the main nerve. This second branch has been followed to its union with the main trunk posterior to the dorsotrachealis muscle. In other cases the second division appears not to occur. After passing back nearly to the posterior border of the thymus gland the nerve enters the extreme posterior part of the dorsotrachealis muscle. It possibly gives off some fibers to the muscle, but the main trunk continues posteriorly into the connective tissue ventral to the lateral border of the longissimus dorsi muscle and between the latter and the intertransversales muscles, running approximately parallel with the ramus lateralis medius of the vagus nerve.

Posteriorly both nerves enter the longissimus dorsi muscle and continue within it to the posterior part of the body (their ultimate distribution). The facial ramus runs near the lateral border of the muscle, in some regions just at the border. A short distance anterior to the level of the posterior limbs the nerve leaves the muscle and runs just beneath the skin. I did not succeed in tracing with certainty its fibers posterior to the pelvis, but they doubtless run far back in the tail. As to the function of this nerve: As it leaves the hyomandibular

trunk some of its fibers are given off to the digastric muscle. Posteriorly it apparently distributes fibres to the dorsotrachealis muscle, but of the certainty of this I have not been able to satisfy myself. Posteriorly its relation to the dorsal series of lateral line sense-organs is such as to make it not improbable that it is concerned with the innervation of these structures. The nerve runs at the extreme lateral border of the longissimus dorsi muscle just beneath the lateral line sense-organs. Unfortunately the nature of my preparations does not permit me to trace fibers from the nerve to the sense-organs, but I find in many instances that as a sense-organ is approached the nerve bends out to the extreme border of the muscle until it lies close against the sense-organ, then after passing the sense organ sinks back to its former level. Posteriorly when the nerve leaves the muscle its fibers may be seen running along almost in direct contact with the sense-organs. The sense-organs continue nearly to the tip of the tail, but I have been unable to trace the nerve posterior to the pelvis. The nerve bears the same relation in position to the dorsal sense-organs that the ramus lateralis inferior of the vagus nerve does to the ventral series of sense-organs, only more intimate.

The suggestion of the presence of lateralis fibers in a branch of the hyomandibular trunk of the seventh cranial nerve is so contrary to accepted opinions that one may well hesitate to advance the possibility. But this entire so-called dorsotrachealis branch is an anomaly, apparently without a homologue. I have been unable to trace any connection between either the ramus superior or the ramus medius of the vagus and the lateral line organs. Neither do I find any communications between this facial branch and any branch of the vagus.

In the light of these facts this nerve evidently should not be termed the dorsotrachealis branch, but more fittingly the ramus lateralis posterior of the seventh cranial nerve.