

ANOMALIES IN THE CERVICAL AND UPPER THORACIC REGION, INVOLVING THE CERVICAL VERTEBRÆ, FIRST RIB, AND BRACHIAL PLEXUS. By LAWRENCE DUKES, B.A., and S. A. OWEN, B.A., Trinity College, Cambridge.

AN interesting specimen which we have found in the dissecting-room of Cambridge University presents the following series of abnormalities in the cervical and thoracic regions.

The numbers of the vertebræ in the lumbar and thoracic regions respectively are normal. In the cervical region, however, the axis and the 3rd cervical vertebra are extensively synostosed, the synostosis involving the bodies, laminæ, and spines. The bodies of the 2nd and 3rd cervical vertebræ are completely fused, as also are the laminæ and spines on the right side. The costo-transverse processes of the vertebræ are not involved in the fusion, the synostosis commencing immediately behind the articular processes, and the nerves issue normally.

The upper part of the fused spines is especially prominent, whereas the lower part, corresponding with the 3rd cervical vertebra, is blunt and flattened laterally.

The costal element of the costo-transverse process of the atlas is ligamentous on the right side, the vertebral artery passing as normally through a foramen which in this case, however, is partly of a ligamentous and partly of an osseous nature.

The 1st rib consists of three parts—osseous proximal and distal extremities, and an intervening ligamentous portion. The bony proximal extremity includes the head, neck, tubercle, and a very small part of the shaft. This ends ventrally in the ligamentous portion, which presents a somewhat round, cord-like appearance, and is about 3 cms. in length. The ligamentous portion at its proximal extremity is rather narrower and more pointed than at its distal extremity, and takes origin about half a cm. from the tubercle.

The head of the rib presents no remarkable feature. The neck, however, has two grooves impressed upon it. The inner

of these two grooves lodges the vertebral artery, which turns over it to gain the costo-transverse foramen of the 7th cervical vertebra, through which it passes. The outer groove, separated from the former by a well marked ridge, is occupied by the 8th cervical nerve as it passes to take part in the formation of the brachial plexus. This same nerve passes over the ligamentous portion of the 1st rib.

The greater part of the 2nd thoracic nerve enters the brachial plexus by joining the 1st thoracic nerve about 2.5 cm. external to the latter's exit from the inter-vertebral foramen.

To effect this junction it has to pass over the 2nd rib, joining the 1st thoracic nerve at the inner side of the ligamentous portion of the 1st rib. The combined trunk then proceeds outwards over the ligamentous portion of the 1st rib, closely applied to and below the trunk of the 8th cervical nerve.

The remainder of the 2nd thoracic nerve is small. It divides into two branches, which supply the 2nd intercostal space.

The subclavian artery passes over the ligamentous portion of the 1st rib, ventral to the combined trunk of the 1st and 2nd thoracic nerves, and, as usual, behind the scalenus anticus, which is attached to the distal bony portion of the 1st rib, just in front of the termination of the ligamentous portion. The scalenus medius, however, is attached to the 2nd rib.

The "profunda cervicis" branch of the superior intercostal passes backwards between the necks of the 1st and 2nd ribs to reach the muscles of the back.