

by black dots owing to staining of the medullary sheaths by osmic acid, as formerly described. In consequence of a transverse lesion, degeneration is shown to have taken place in the *direct* and *crossed pyramidal tracts*, more especially, on each side, so that it must be apparent that the Marchi method is one of the best known for determining the extent of degeneration of nerve tracts in consequence of a lesion above or below a certain point. Of course when degeneration is complete and the myelin has been absorbed, it is impossible to apply such a method. In such cases, however, the Weigert-Pal technique would reveal the presence of old degenerated areas by the absence of staining. There is, besides Wallerian degeneration another which was not known to us till a few years ago.

It has been shown by numerous observers that after section of the nerve there is not only peripheral degeneration, but important changes in the body of the neurone itself. This form of alteration has been termed

*primary degeneration*, a good example of which is represented by Figure 11. On the right is seen a fairly normal multipolar neurone of the nucleus of the oculomotorius nerve; on the left another from the same nucleus, showing the results thirteen days after the operation—section of the oculomotorius nerve on one side. It will be readily observed that the orderly arrange-

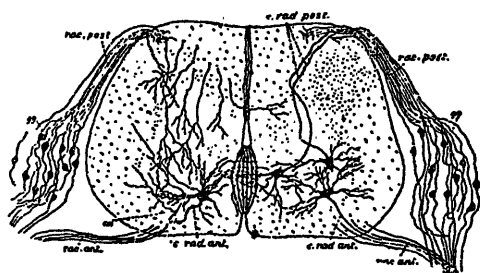


FIG. 8. Transverse section of the cord of a chick embryo (after Van Gehuchten). c. rad. ant., cells giving rise to axones of ventral roots; c. rad. post., cells whose axones give rise to dorsal roots; col., collateral passing from axone of cell of the ventral horn back into the grey matter; gg, the cells of spinal ganglia; rac. post., dorsal root fibres; rac. ant., ventral root fibres.

ment of the Nissl bodies has been greatly disturbed; that many of them have entirely disappeared, and that the nucleus is eccentric in position.

There has been a good deal of discussion as to the nature of these Nissl bodies. There seems to be little doubt that in the fresh uninjured cell or neurone they are not to be seen, but that they arise as a result of treatment with reagents. They, however, represent material that in the fresh cell is in solution and which is probably of the nature of a nucleoproteid. It has been suggested by Held that they represent reserve material on which the cell can draw during activity. At all events, their study is of practical importance, for they are destroyed by numerous body poisons, elevation of temperature and during prolonged anaesthesia, it is said. Very interesting to the physiologist is the fact that section of the posterior roots leads to degeneration of this character in the neurones of the anterior horn of the spinal cord. It would seem that the