

REGENERATION OF PERIPHERAL NERVES.¹

BY

ROSS G. HARRISON,

Yale University, New Haven, Conn.

The nerves of one side of the tail of larvæ of *Rana sylvatica*, 2-2.5 cm. long, were cut with fine scissors just beyond the point of emergence from between the myotomes. The processes of degeneration and regeneration were then observed from day to day in one and the same nerve in the living specimen. The degenerative processes take place very rapidly. In less than 24 hours the medullary sheath is completely disintegrated beyond the lesion and for a very short distance central to it. In the axis-cylinder of both the medullated and the non-medullated nerves the signs of degeneration are less marked, though unmistakable, and are noticeable in even the finest and most remote twigs. The Schwann cells become less regularly spindle-shaped, with a somewhat humpy surface, and do not adhere so closely to the axis-cylinder. They are also found to contain a few granules. After one or two days it is found that the two cut ends of many of the nerves have united together by a protoplasmic bridge, and in such cases the degeneration of the peripheral part of the axis-cylinder is immediately arrested, indicating that in these larvæ a primary healing of nerve fibers is possible. The medullary sheath is not rehabilitated immediately and the process of re-formation of this structure resembles that of its initial development. When the peripheral portion of a nerve fails to unite with a central stump, degeneration continues and ultimately the nerve disappears, the finer twigs disintegrating first. When a central stump fails to unite with a peripheral end, regeneration by a comparatively slow process, in a centrifugal direction, takes place. There is no indication whatever of any power of "auto-regeneration" in the nerves whose connection with the central end remains severed.

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