

their opaque, white aspect. When perfectly fresh they appear to be homogeneous; but soon after removal from the body each fiber presents, when examined by transmitted light, a double outline or contour, as if consisting of two parts (Fig. 630). The central portion is named the **axis-cylinder**; around this is a sheath of fatty material, staining black with osmic acid, named the **white substance of Schwann** or **medullary sheath**, which gives to the fiber its double contour, and the whole is enclosed in a delicate membrane, the **neurolemma**, **primitive sheath**, or **nucleated sheath of Schwann** (Fig. 633)

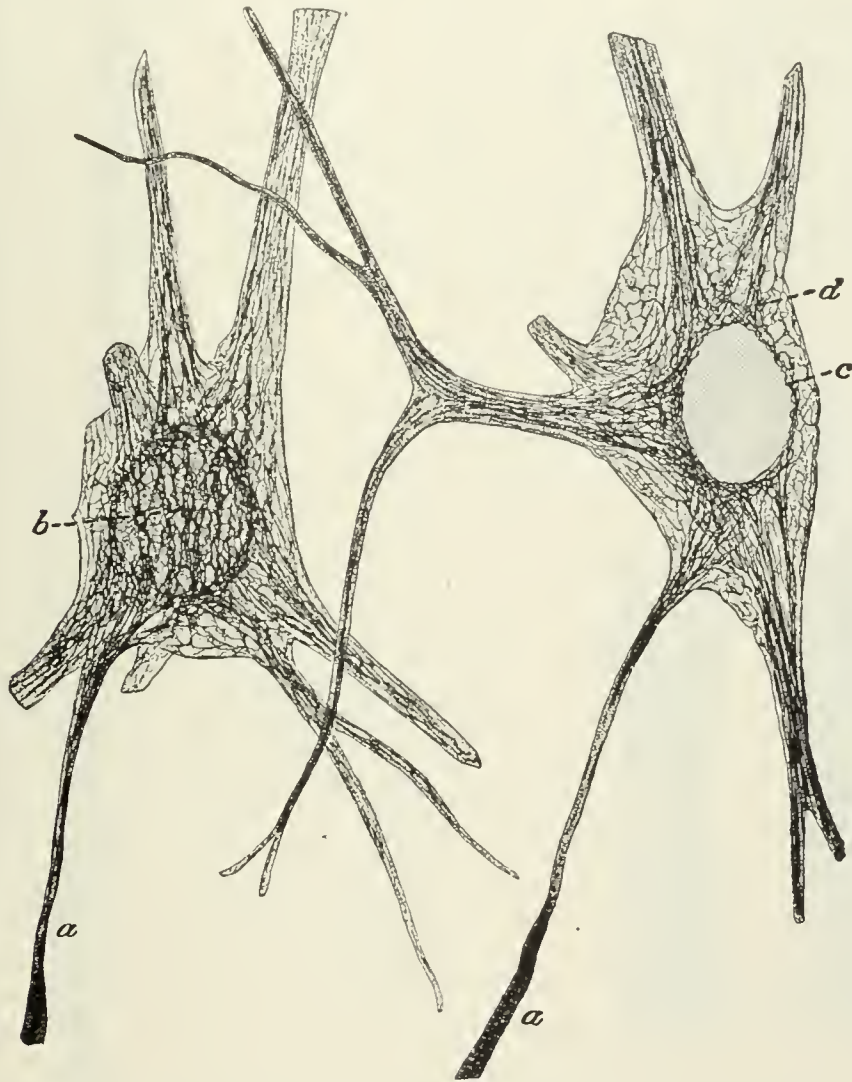


FIG. 629.—Nerve cells of kitten, showing neurofibrils. (Cajal.) *a*. Axon. *b*. Cyton. *c*. Nucleus. *d*. Neurofibrils.

The **axis-cylinder** is the essential part of the nerve fiber, and is always present; the medullary sheath and the neurolemma are occasionally absent, especially at the origin and termination of the nerve fiber. The axis-cylinder undergoes no interruption from its origin in the nerve center to its peripheral termination, and must be regarded as a direct prolongation of a nerve cell. It constitutes about one-half or one-third of the nerve fiber, being greater in proportion in the fibers of the central organs than in those of the nerves. It is quite transparent, and is therefore indistinguishable in a perfectly fresh and natural state of the nerve. It is made up of exceedingly fine fibrils, which stain darkly with gold chloride (Fig. 632), and at its termination may be seen to break up into these fibrillæ. The fibrillæ have been termed the **primitive fibrillæ of Schultze**. The axis-cylinder is said by some to be enveloped in a special reticular sheath, which separates it from the medullary sheath, and is composed of a substance called **neurokeratin**. The more common opinion is that this network or reticulum is contained in the white