

I shall now proceed to show what is the real significance of this concept by a series of illustrations, without which it would be practically hopeless for any one to attempt to follow what I have to say. The illustrations which I am about to use are derived from a great many original sources, but the large proportion of them are to be found in Barker's magnificent book on the nervous system, and it is with no little pride and pleasure that I refer to the fact that this work has made a profound impression on the leading neurologists of Europe as well as America.

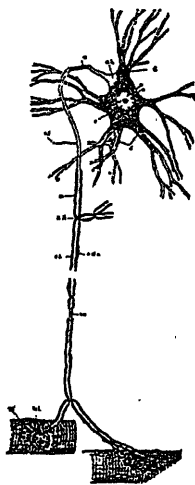


FIG. 1. Diagrammatic representation of a motor neurone of the lower level. The cell-body together with the protoplasmic processes, its axis cylinder process or axone, side branches or collaterals, and end ramifications, all belong to a single cell or neurone; a.h., axone hillock devoid of Nissl bodies and showing fibrillae; ax, axis cylinder or axone; at m it becomes surrounded with myelin and the outermost sheath or the neurilemma, which is probably formed from the mesoblastic layer of the embryo; c, cytoplasm showing tigroid bodies in the ground substance; d, protoplasmic processes or dendrites containing Nissl bodies; n, nucleus; n', nucleolus; n.R., node of Ranvier; s.f., side fibril; n of n, nucleus of the neurilemma; tel, the motor end plate or telodendrion; m, striped muscle fibre; s.L., segmentation of Lautermann.

Figure 1 is diagrammatic and is meant to show practically every part of a neurone. One recognizes a *cell-body* with a *nucleus* and *nucleolus*, both of which are very distinct, and a large number of branching processes known by various names. The Germans with much appropriateness term them, *protoplasmic processes*, as they are evidently mere extensions of the material of the cell body; by English writers they are more frequently termed *dendrons* or *dendrites*. Passing off either from the cell body, which has been termed a *perikaryon*, or from the base of one of the dendrites one sees a single long arm of the cell termed its *axone* and ending in this instance in a very complicated modification of its axis cylinder known as *muscle plate* when it terminates as here in a muscle; but when the axone ends in a multitude of branches which may come in contact with similar branching ends in another neurone, such an anatomical complex is spoken of as an *arborization*, *telodendrion* or *synapse*. At the beginning the axis cylinder of the axone may be absolutely naked, but further from the cell body it is usually covered with a coat of myelin, known as the *medullary sheath*. In the nerve centres these two alone and their branches constitute the axone; but outside the nerve centres, that is to say, constituting the nerve fibre, the axone may be provided with a third covering known as the *neurilemma*. Both when naked and after it is covered with this myelin sheath the axone may give off side branches termed *collaterals* and which are of great physiological importance. Such a result as that represented in Figure 1 cannot be achieved by any one techni-