A Survey of Different Opinions Relating to the Structure of the Peripheral Autonomic Nervous System

By

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With 14 Figures

In this introductory survey of the histological structure of the peripheral autonomic nervous system, three topics will be dealt with, viz., the structure of the peripheral autonomic nervous strands, the interstitial cells, and the way in which the autonomic nervous impulse may be transmitted to the effector cells.

Since Clara, in 1954 (Clara, 1955), gave a similar review at a somewhat similar occasion, a number of investigations on this controversial subject has been published. Especially the results obtained by those authors who used that new tool, the electron microscope, are of the utmost interest and importance. The meaning of these recent results, however, cannot be appreciated at its proper value without any knowledge of historical backgrounds and discussions. Therefore, it will be necessary to deal also with earlier
investigations in which different techniques were used, although at least part of them seem to have lost much of the value, formerly attributed to them.

The literature on the subject is tremendous and it has been necessary to make some choice. References to more extensive surveys will be found in the list of titles.

I. The structure of the peripheral autonomic nervous strands

Using silver techniques or the methylene blue supravital staining method, a tridimensional network is observed, spreading at the surface as well as

![Figure 1](image)

Fig. 1. "Sympathetic ground plexus" of small artery showing "anastomoses". Bielschowsky method. Reproduced from Boeke, Acta anat., Basel, 8 (1949).

within all systems and organs which are autonomously innervated, including the skin. It has been more or less generally accepted that this network is composed of plasmatic nucleated bands often clearly showing filiform structures. This network is known as the sympathetic ground plexus of Boeke (Fig. 1), the preterminal reticulum of Reiser, or the distal nervous syncytium of Jabonero. It also includes the terminal reticulum of Stöhr (Fig. 2). By many authors this meshwork has been considered to consist of syncytial plasmatic strands containing so-called neurofibrils which are often extremely delicate and may show varicosities or beads. The neurofibrils were observed to run either parallel or to anastomose freely (Fig. 1). Anastomoses would not be produced by artificial adherence of neurofibrils but be likewise present in the living tissue.