

Bioelectric phenomena in relation to neural function

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Consideration of bioelectric phenomena described by earlier workers, including especially Becker and associates,¹ and Burr,² leads to the hypothesis that normal function of the nervous system is accompanied by the centrifugal transport of negative charge carriers via the neuraxons. Other experimental evidence and theoretical reasoning support the idea that exchange of ions and equilibration of charge between the atmosphere and the animal body take place across specialized regions of the integument, such as those discussed by Roppel and Mitchell,³ through processes that are under control of the automatic nervous system. In the light of these past observations, we have attempted to develop a unifying view in which a number of bioelectric manifestations, such as the existence of skin points with anomalous electrical properties, the nonuniform distribution of skin potential, and the biologic effects of aeroions, may be understood as expressions of more fundamental processes. Practical extensions of this reasoning may lead to explanation of the mode of action of peripheral stimulation therapies.

Our experimental testing of this general hypothesis has included the study of the distribution of the body surface potential in human beings under normal and abnormal physiologic states. In attempts to define the nature of the control over cutaneous electrical properties by the autonomic nervous system, we have initiated a study of the differential distribution of metabolites over the skin surface by use of Fourier transform spectroscopy. Initial results of these investigations are presented and discussed.

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1. Becker, R.O., Bachman, C.H., and Friedman, H.: The direct current control system: A link between environment and organism. *NY State J Med* 62:1169-76, 15 Apr 62
 2. Burr, H.S.: *The fields of life: Our links with the universe*. Ballentine Books, Inc., New York, 1973
 3. Roppel, R.M., and Mitchell, F., Jr.: Skin points of anomalously low electric resistance: Current-voltage characteristics and relationships to peripheral stimulation therapies. *JAOA* 74:877-8, May 75