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CONTENTS

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SOME UNDERLYING PRINCIPLES IN THE STRUCTURE OF THE NERVOUS SYSTEM[1]

IT has long been recognized that the fundamental problems of the nervous system are impossible of approach without keeping in view continually the finer structure of the parts concerned. Nervous organs are not relatively homogeneous bodies as, for instance, glands are, but are intricate systems of conducting paths and end-stations and in this respect are unlike the other organs of the body. This contrast appears clearly in many deficiency tests. If a portion of a gland, such as the pancreas or the liver, is removed, the loss may be quickly covered by the increased activity of that part of the organ which is left, but the ablation of even a small portion of a nervous organ is often followed by serious and permanent defects, which no amount of activity on the part of the adjacent tissue can make good. Thus the destruction of a small group of the receptive cells in the retina results in a scotoma, which the activity of the adjacent cells is incapable of remedying. Hence it appears that in the nervous system specialization may be said to have reached even to the cells themselves. Such a degree of differentiation is to be found in no other organ of the body, except perhaps the reproductive glands, whose sperm cells and egg cells, with their highly individualizing capacities, are separately quite as unique as are many nerve cells. It is, therefore, not sur-

[1] Address of the vice-president and chairman of Section F, American Association for the Advancement of Science, Pittsburgh, December 31, 1917.