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THE FUNCTIONAL ACTIVITY OF SINGLE UNITS IN THE CENTRAL NERVOUS SYSTEM¹

By Dr. J. F. FULTON

LABORATORY OF PHYSIOLOGY, YALE UNIVERSITY SCHOOL OF MEDICINE

WITH the recognition of the neurone as the ultimate anatomical unit of the nervous system it came to be tacitly assumed that all nervous and mental phenomena are, in the last analysis, explicable in terms of the combined activity of single nerve elements. Individual neurones, however, had, until very recently, eluded isolation as functioning entities, and knowledge of the intimate details of their behavior was therefore lacking. Without this information it was quite impossible to form a satisfactory conception of the elementary principles of nervous activity, and many details of reflex action remained obscure. Single muscle fibers, to be sure, had been studied by Lucas, Pratt and others to great advantage, and single

axones had been placed under direct observation by using artificial stimulation (pore electrode), but these studies gave little or no information concerning the characteristics of the nerve cell itself. The responses of a single intact neurone, activated within the central nervous system by a natural stimulus, were first placed under direct observation in 1928, and since then notable progress has been made in the analysis of their behavior. The quest of a single neuro-muscular unit has in fact had many of the dramatic features associated with the quest of the single atom, and the success achieved by the physiologist is in most respects quite as remarkable as that of the physicist.

Isolation of the unit was made possible largely by virtue of the electrical response accompanying activ-

¹ Schiff Foundation Lecture, Cornell University, April 17, 1931.

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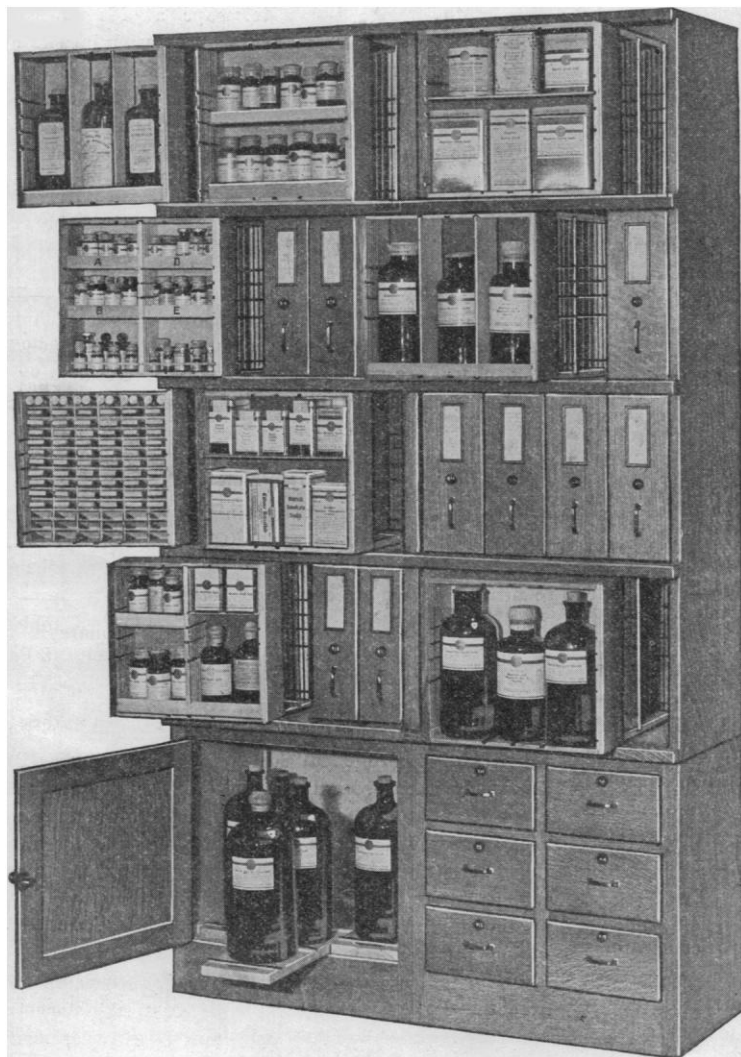
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