HANDBOOK OF NEUROCHEMISTRY

VOLUME VI

ALTERATIONS OF CHEMICAL EQUILIBRIUM IN THE NERVOUS SYSTEM

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Edited by Abel Lajtha

Volume I	Chemical Architecture of the Nervous System
Volume II	Structural Neurochemistry
Volume III	Metabolic Reactions in the Nervous System
Volume IV	Control Mechanisms in the Nervous System
Volume V	Metabolic Turnover in the Nervous System
Volume VI	Alterations of Chemical Equilibrium in the Nervous System
Volume VII	Pathological Chemistry of the Nervous System

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Edited by Abel Lajtha

*New York State Research Institute
for Neurochemistry and Drug Addiction
Ward's Island
New York, New York*

VOLUME VI

ALTERATIONS OF
CHEMICAL EQUILIBRIUM
IN THE NERVOUS SYSTEM

Ⓔ PLENUM PRESS • NEW YORK—LONDON • 1971

Library of Congress Catalog Card Number 68-28097

SBN 306-37706-3

ISBN 978-1-4615-7177-3

ISBN 978-1-4615-7175-9 (eBook)

DOI 10.1007/978-1-4615-7175-9

© 1971 Plenum Press, New York

Softcover reprint of the hardcover 1st edition 1971

A Division of Plenum Publishing Corporation

227 West 17th Street, New York, New York 10011

United Kingdom edition published by Plenum Press, London

A Division of Plenum Publishing Company, Ltd.

Davis House (4th Floor), 8 Scrubs Lane, Harlesden, NW10 6SE, England

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PREFACE

It has been recognized for more than a thousand years that the function of the brain, like the function of the other organs of the body, is determined by its physical, chemical, and biological properties. Evidence that even its highest functions could be explained by these properties was gathered only in recent years, however; these findings, which clearly have to be confirmed by a great deal of further experimental evidence, indicate that most, if not all, of the functions of the brain are based on its biochemical and biophysical mechanisms. This at first hearing may sound rather simple, but the ability to understand learning, emotion, perhaps even creativity, on biological terms may well be the most important scientific discovery of all time. Few pieces of knowledge can influence our future health and well-being to the degree that understanding of mental mechanisms will.

It has been clearly shown in many ways in the previous volumes of this Handbook that from the biochemical or neurochemical point of view the brain is one of the most active organs. The brain seems stable and in some respects permanent; this is evidence not of inactivity but of carefully controlled homeostasis, of dynamic rather than static equilibrium, with most components undergoing metabolic alterations. What this dynamic equilibrium entails is that brain possesses plasticity; its very active biological processes are likely to impart some stability, the possibility of repairing damage, certainly the possibility of adapting to varying situations and conditions. These dynamic processes, however, also give this organ a vulnerability not always fully realized. The mere existence of dynamic processes brings with it the possibility of influencing such processes. The present volume emphasizes the vulnerability of the nervous system, and makes one wish that in the present time, when so many try to experiment with substances or conditions that influence the brain or mental states, this vulnerability of the nervous system would be more widely appreciated and respected. This heuristic aim, however, is beyond the scope of the present volume, which is designed more for researchers engaged in prying the secrets of biological mechanisms from the nervous system. These chapters clearly demonstrate that cerebral chemical processes can be influenced in a number of ways, and can undergo changes that in turn will influence the functions of the nervous system. Surely this is one of the most exciting fields of neurochemistry, and one that needs many dedicated investigators. The number of problems waiting

to be investigated is great; these chapters not only show which ones have been investigated, but also indicate a great many unmapped areas that need to be explored.

New York, New York
December 1970.

Abel Lajtha

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