were observed.

especially the hemodynamic and metabolic ones. In this connection the importance of the present work lies particularly in the fact that it provides information on the state of the central homeostatic mechanisms involved in the development of cerebral ischemic accidents. The work has four sections. In the first section the data concerning the reactivity of the fibrinolytic system in patients with cerebrovascular accidents are presented. The second one deals with the humoral and vasomotor reactivity to the emotional stress, the third with the reactivity to cold stress and the fourth with the reactivity to hypoglycemic stress. Using multiple methods the author succeeded in demonstrating discrepancies in humoral and vasomotor reactivity between patients with cerebral infarct and those with cerebral hemorrhage. Humoral reactivity in cerebral infarct patients showed: (1) an inert clotting mechanism (sustained hypercoagulability after applying various stress stimuli); (2) a poor mobilization of the fibrinolytic system; (3) a long-lasting increase in slow serum lipoproteins; (4) a delayed recovery from insulin- and tolbutamid-induced hypoglycemia. In cerebral hemorrhage patients the author noted: (1) a high response of the fibrinolytic system; (2) a reactive clotting mechanism; (3) slight variations in serum lipoproteins. Generally the changes were similar to those noted in controls.

Another finding presented in the work and which deserves a special attention is the possibility to induce lumen change of the cerebral vessels up to appearance of cerebrovascular spasms by immersion of the hand in ice water.

By correlating all these data the author sustains that the patients with cerebral infarction display an inertia and those with cerebral hemorrhage a hyper-reactivity of the higher autonomic centres. This view is also supported by the study of the adrenergic messenger mobilization during stress conditions (poor mobilization in patients with cerebral infarct, high mobilization in those with cerebral hemorrhage).

At the end of the monograph the possible participation of the high autonomic centre disorders in the pathogenesis of the cerebrovascular accidents is discussed. The author suggests that the inertia of the higher autonomic centres predisposes to cerebral ischemic accidents, hyperreactivity to hemorrhagic ones. This new approach of cerebrovascular accidents is also of therapeutic interest, since by discovery and correction of the disorders of autonomic reactivity it might be possible to prevent or at least delay the occurrence of strokes. Dr. M. I. Botz, Bucharest

**Book Reviews**

The two categories of cerebrovascular accidents also displayed discrepancies in vasomotor reactivity. In cerebral infarct patients a vasomotor hyperreactivity was usually noted. The patients with cerebral hemorrhage displayed especially vasomotor hyporeactivity; after applying various stress stimuli a long-lasting increase in arteriolar digital tonus, a rise in systolic and diastolic blood pressure and tachycardia were observed.

The author demonstrates that the vasomotor and humoral alterations noticed after stress stimuli in the two categories of cerebrovascular accidents have a consensual character: the vasomotor hyperreactivity is associated with a high response of fibrinolytic system and a reactive clotting mechanism and the vasomotor hyporeactivity is associated with a scant response of fibrinolytic system and an inert clotting mechanism.

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This is an excellent monograph on echoencephalography which will be useful to anyone performing this type of clinical examination. The book contains a great deal of fundamental physical and experimental information which is essential for understanding the possibilities and limitations of diagnostic ultrasonography in neurology. The material is presented in a clearly understandable form without emphasis on mathematical formulas. It is, nonetheless, not oversimplified.

Most of the experimental data is drawn from the results of Württe's own research group who for some years have been occupied with measuring the echo-encephalographic errors in range and azimuth which are produced by the skull. An important section of the book is devoted to the application of computer techniques to eliminate the factor of examinator bias. The results thus far obtained by the author using an automatic midline computer seem very promising.

The monograph also mentions other newer ultrasonic techniques such as B-scan and Doppler-sonography. Each chapter contains a list of selected references which allows the reader to delve deeper into areas of particular interest as desired. H. E. KAESER, Basel

This book clearly defines the aims of neurocybernetics and neurobionics. The elementary notions of statistics, information theory, game theory, stochastic processes, theory of algorithms, theory of automatic regulation, feedback and biologic regulation are reviewed and presented in a clear way requiring no special mathematical knowledge.

One chapter deals with modelling of neuronal networks and common problems of cybernetics in brain research. Questions such as selforganization in a hierarchic structure, optimization, memory, reliability, determined or statistic organization and presynaptic inhibition are discussed in this chapter. With great care the problems of recognition and learning are analyzed and a basic artificial network is shown imitating these functions. Of particular interest for the physician could be the chapter dealing with problems of regulation of the 'miliieu interieur'. The authors suggest three different levels of organization: (1) the level of homeostatic systems, (2) the level determining the optimal regime of the 'miliieu interieur', and (3) the level for the evaluation of the optimal regime.

These principles are illustrated with examples of the regulation of the body temperature and the glucose levels in the blood. A fascinating problem discussed in this volume is the overall reliability of the organism made of relatively unreliable elements. The practical application of these theories is demonstrated by enumerating the use of computers for medical diagnosis, prognosis and the choice of the best method for treatment. This book will be a useful orientation and introduction for biologists and physicians interested in the problems of neurocybernetics and neu robotics. P. F. ANDRES, Basel
The volume contains the proceedings of an international symposium held near Cologne (Germany) from October 9th to 12th, 1969, sponsored by the Farbenfabriken Bayer. The meeting was divided into several sessions including the following topics: Origin and Axonal Transport of Adrenergic Nerve Granules, Mechanism of Transmitter Release with Special Reference to the Problem of Exocytosis, Chemical Sympathectomy, Effects of Drugs on Uptake and Release of Catecholamines. Since it is not possible to summarize the whole meeting, only some of the papers shall be mentioned.

The electronmicroscopic and biochemical investigations of Pellegino de Iraldi and de Robertis which deal mainly with the vesicular material at the proximal stump of regenerating axons suggest that a local reaction based on dilatation, proliferation and pinching off of neurotubules is the main process involved in the formation of granulated and non-granulated vesicles.

Dahlstrom describes effects of drugs (reserpine, colchicine, vinblastine) on the axonal transport of amine storage granules and presents evidence indicating that the perikaryon is the site of formation of these granules. Helle reports on immunological properties of chromogranin, which was detected in perfusates from stimulated adrenal medulla and spleen. Geffen et al. showed the distribution of chromogranins in sympathetic neurons by immunofluorescence histology and their release by nerve impulses. Their results favor the hypothesis that the transmitter is liberated by partial exocytosis of vesicles.

In one session (2b) entitled with 'mechanisms of transmitter release with special reference to the problem of exocytosis' several papers are presented dealing with quantal aspects of catecholamine release from adrenal medulla and sympathetic nerves and also models are discussed for release mechanisms [Kirshner and Viveros; Folkow and Haggendal; Haggendal; Stjärne]. Thörner et al. report on chemical sympathectomy using 6-hydroxydopamine. Applications and limitations of this new method of sympathectomy are discussed, together with a hypothetical mechanism of action.

There are three sessions dealing with effects of drugs on uptake and release of catecholamines. Of the many interesting papers of these sessions only some will be mentioned. Von Euler talks on effects of drugs, which interfere with adrenergic transmission, and metabolic factors on uptake and release of catecholamines. Of the many interesting papers of these sessions only some will be mentioned. Von Euler talks on effects of drugs, which interfere with adrenergic transmission, and metabolic factors on uptake and release of catecholamines. Muscholl describes actions of cholinomimetic drugs on the release of noradrenaline of isolated perfused rabbit heart. Palm et al. discuss effects of catecholamine releasing drugs on membranes of subcellular particles. Axelrod et al. have shown that the synthesis of tyrosine hydroxylase, the rate limiting step in the catecholamine biosynthesis, and phenylethanolamine N-methyl-transferase, the final step in adrenaline formation, is regulated by the activity of the sympathetic nervous system and by pituitary and corticoid hormones. Carlsson presents data on the action of drugs on amine uptake mechanisms in the brain. Glowinsky studied the release of labelled monoamines from central amineergic terminals in vivo and in vitro and examined the effects of various psychotropic drugs on synthesis, release and reuptake processes in slices of brain.

The volume contains a number of interesting papers presenting new data and aspects of uptake and release mechanisms of catecholamines. It is of great value that comments and discussion of the participants are published at the end of each communication.