Soviet Brain Science

The Physiological Mechanisms of Cerebral Blood Circulation. A. I. NAUMENKO and N. N. BENUA. Translated from the Russian and edited by Josef Brožek and Ernst Simonson, with the assistance of Margaret Maria Brožek. Thomas, Springfield, Ill., 1970. xviii, 126 pp., illus. $8.75.

Blood circulation in the brain and the mechanisms of its regulation have long been a subject of intense interest and investigation in physiology and medicine. Activity in this field received additional impetus about 25 years ago with the advent of reliable quantitative methods for measuring cerebral blood flow in man. These methods were developed and first exploited mainly in the United States. More recently they have been modified, refined, and extended largely through the efforts of Scandinavian workers, and Western Europe has seen a boom in research activities in this field. Major centers for research on the cerebral circulation now exist not only in the United States but also in Denmark, Sweden, Great Britain, Italy, and France, and also in Japan. The combined activities of these various groups have led to the publication of vast amounts of information which, though often confirmatory of results obtained many years ago with less quantitative methods, describe and explain in great detail the properties of the normal cerebral circulation, its regulation, and its behavior in pathological states and in response to drugs. Numerous reviews of various aspects of the field have appeared in the American, the European, and the Japanese literature.

A striking feature of these reviews is the relative dearth of references to Soviet literature. In view of the known predilection of Soviet science for the central nervous system, this could hardly mean that Soviet scientists have done little work on the cerebral circulation. It is generally assumed that the neglect of the Soviet literature is the result of language barriers, inaccessibility of Soviet publications, and the infrequency of interchange between Soviet and Western scientists. Brožek and Simonson's translation of the monograph by Naumenko and Benua confirms this assumption and proves that Soviet science has not been idle in the field of the cerebral circulation. Indeed, the bibliography is the major contribution of the book. Documentation is not limited to the Soviet literature; citations are from all sources and are thoroughly interspersed and integrated so that all information, regardless of national origin, is brought to bear in the analysis of any given problem. Even if allowance is made for prejudicial reliance on Soviet work, it is clear that Soviet scientists have made significant contributions to the physiology of the cerebral circulation which have gone largely unrecognized in the West.

Several features of the book greatly enhance its bibliographic value. All references include titles, and the Russian titles are accompanied by English translations. A mere scan of these titles attests to the breadth of Soviet study of the subject. The text reflects an intent to encompass as much of the relevant literature as possible, and its style is to a large extent that of an annotated bibliography. This is generally disadvantageous to the readability of the text; it often leads to disjointed and incomplete treatment of the points under consideration and obscures the authors' critical evaluation of the cited work. It serves, however, to identify the workers with their work and thereby prepares the reader for more intensive reading of the source literature.

The monograph covers the conventional subjects relating to the control of the cerebral circulation. There are chapters on anatomy; chemical, neurohumoral, and neural control; the relationships between cerebral blood flow, metabolism, and functional activity; the action of drugs; and one on autoregulation. The treatment of autoregulation is unique in that it attempts to relate all variables and parameters which bear on this phenomenon in a single, unifying mathematical expression. The mathematical treatment, however, contributes merely a symbolic statement of what is already known and offers no greater understanding of the mechanisms of autoregulation. Not unexpectedly, there is a chapter on conditioned reflex control of the cerebral circulation; the treatment is very brief and unconvincing and is probably intended as little more than the traditional Soviet obeisance to Pavlovian concepts.

The monograph reveals no remarkable new insights into the physiology of the cerebral circulation. It confirms that Soviet scientists are preoccupied with the same problems as are workers elsewhere and are proceeding along similar lines. Their methodological approaches are different, however, and they have not yet adopted radioisotopic and inert-gas methods and studies in human subjects, which are very popular in Europe and the United States.

Perhaps because it is the authors' own method of choice, the monograph suggests that there is extensive use of electroplethysmographic techniques; these techniques are generally considered in the West to be of dubious value in the quantitative measurement of perfusion rates. There is a noticeable reluctance to downgrade the role of the nervous system and to accept the concept of chemical control of the cerebral circulation; even the classic effects of CO_2 on the cerebral vasculature are interpreted in terms of chemoreceptor mechanisms rather than direct chemical effects.

It is unlikely that the reader can gain a coherent and comprehensive picture of the physiology of the cerebral circulation from this book. Its value lies in the breadth and representation of the references, and the inclusion and integration of the Soviet literature with that of the Western world. It is recommended mainly as a bibliographic source.

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Constituents of Marine Life

The Chemical Biology of Fishes. With a Key to the Chemical Literature. R. MALCOLM LOVE. Academic Press, New York, 1970. xvi, 550 pp., illus. $21.

The purpose of this book is to provide "a biology of fish seen through chemical analysis." It is divided into three parts: the text proper and two bibliographical indexes, one based on chemical substances and the other on the names of fish. Fortunately, the author does not allow himself to be limited by the stated objective. Had he done so, this book would have been severely circumscribed and of less interest to students of oceanic science.

Chemical analytical data, per se, are sometimes provocative but are justifiably overshadowed by studies in biochemistry and physiology that relate more directly to the economy of the whole organism. Regrettably, very little chemical work of any nature has been done specifically to contribute to deeper and broader horizons in biology. The author was obliged to compile and interpret data from a vast literature of