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BOOK REVIEW

HEINZ, E.: MECHANICS AND ENERGETICS OF BIOLOGICAL TRANSPORT. — Springer Verlag, Berlin — Heidelberg — New York, 1978. 159 pp., DM 49.00, US \$ 24.50.

At present, it is not possible to study biological systems without taking into consideration biological transport, which has become the subject of an important and developing scientific branch.

The book by Erich Heinz can be characterized as an introduction to the problematics of biological transport, the basic principles of which are characterized by means of models described from the point of view of thermodynamics. The models were simplified to emphasize the approach to the problematics, which must be considered in applying the corresponding relations to special processes and, quoting the author, "They may at best serve as a basis on which the more appropriate equations may be developed".

The subject was divided into eight chapters. The basic thermodynamic conceptions are briefly outlined in the first, introductory chapter without which the derivation of more complex transport equations would not be possible. In the second to fifth chapters, attention is devoted to the so-called one-flow systems. Membrane structure is described here together with certain mechanistic ideas on the mode of transport of different substances across membranes from the point of view of both free diffusion and facilitated diffusion. Relations characterizing the transport systems are derived from these conceptions and on the basis of simplified assumptions by expressions of the mass action law. The end of this part is devoted to the one-flow systems which are described according to the laws of the thermodynamics of irreversible processes. It is here also shown, how particular relations expressed according to the mass action law and those expressed according to the thermodynamics of irreversible processes can be converted into one another, and limitations of such transfers are mentioned.

The remaining chapters deal with the two-flow systems of the active transport. General conceptions concerning active transport are explained and several examples are presented. Both primary and secondary active transport is studied on the basis of models of active transport characterized by terms of the mass action law. Analogous expression according to the relations of irreversible thermodynamics is used too, and it is shown again how these two expressions can be converted into one another. Interactions between solute flow and solvent flow and thermodynamic bonds are dealt with in the concluding part of the book, both phenomena being described in terms of the thermodynamics of irreversible processes.

The text is complemented with 35 figures, and 84 references are available to the reader when more detailed information is needed.

This book is especially recommendable to those who wish to get acquainted with the principles of the biological transport.

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