

BOOK REVIEW

ENERGY TRANSFORMATIONS IN BIOLOGICAL SYSTEMS. Ciba Foundation Symposium 31. Elsevier, Excerpta Medica, North Holland, 1975, 416 pages. \$29.25.

This symposium was set up as a multidisciplinary one, and the book contains papers which treat a wide range of topics in bioenergetics. After a brief review of the early developments of bioenergetics given by F. Lipmann, in tribute to whom the symposium was held, reviews outlining the present knowledge and current theories of energy transfer mechanism in mitochondria and chloroplasts are given by M. Klingenberg and by F.R. Whatley, respectively. Other review-type papers are on the mechanisms of energy transformation in bioluminescence (J.W. Hastings), in the purple membrane of *Halobacterium Halobium* (D. Oesterhelt), and in vertebrate photoreceptors (W.A. Hagins, W.E. Robinson, and S. Yoshikami).

More specialized papers are the one by M. Cohn describing the homology in the active site structure of phosphotransferases and also the paper by R.D. Keynes on the ionic channels in excitable membranes. In another specialized paper, H. Gutfreund and B.R. Trentham, using rapid reaction methods, found that binding of ATP to Mg^{2+} -dependent myosin ATPase is followed by an isomerization step. They stress the analogy to the release of ATP in mitochondrial ATP synthesis.

There are four papers dealing with transport: I.M. Glynn and S.J.D. Karlish describe various modes of cation transport catalysed by the Na^+K^+ -dependent ATPase; M. Klingenberg discusses the transport of ADP and ATP through the mitochondrial membranes; S. Rosmann describes the bacterial phosphoenolpyruvate: sugar phosphotransferase system; and P.J.E. Henderson and H.L. Kornberg discuss the active transport of carbohydrates by *E. Coli* and suggest a model based on the chemiosmotic theory. An interesting discussion of this theory appears after the paper.

In a section devoted to muscular contraction, the theories of origin of force in muscles are reviewed by A.F. Huxley. The thermodynamic aspects are discussed in papers by C.W.F. McClare and by D.R. Wilkie, and the effect of phosphate, ATP and Mg^{2+} on the mechanical response of insect flight muscle is reported by D.C.S. White and M.M.K. Donaldson.

The two last papers in the book deal with energy and metabolic control. E.G. Krebs and J.T. Stull discuss glycogen phosphorylase and B. Hess the energy requirement for control of enzyme reactions.

The discussions which follow each paper often contain some valuable pieces of additional information and should be read in conjunction with the paper.

In general, this is a well-produced book and is certainly to be recommended both to specialists in bioenergetics and to those who wish to be introduced to these important subjects.

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