ability, statistics, stochastic variables, ergodic ensembles, and so forth, are developed as needed. In my opinion, the book would gain much by including a more complete and precise treatment of these concepts, so important, for example, in problems involving noise. It would also seem desirable to include more in the way of application to problems of system design in which the methods of information theory are advantageous. The student who finishes the book may wonder to some extent what the fuss is all about. Error-detecting codes, theory of radar information, and telephone traffic problems, to name but three possibilities, could provide such examples and balance the almost unrelieved mathematical and theoretical flavor of the treatment.

In spite of this, the textbook succeeds fairly well in bridging the gap between beginning graduate level on the one hand, and the work of Wiener, Shannon, and current research on the other.

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The Energetics of Development. A study of metabolism in the frog egg. Lester G. Barth and Lucena J. Barth. Columbia Univ. Press, New York, 1954. xviii + 117 pp. Illus. $3.

In the preface to this book, the authors frankly admit that, in spite of the wealth of experimental results in the physiological embryology of the frog, we still lack certain unifying concepts that are necessary for an understanding of the direct coupling between energetics and differentiation. They then proceed with a review of recent studies (mostly those appearing after 1949) of the mechanisms by which the energy of the frog's egg is stored, released, and transferred during early development.

In the introductory chapter, the authors discuss some of the problems of tracing the chain of reactions from the stored energy-rich compounds to the final acceptors of energy within the differentiating cells. They recognize the possibility that some developmental processes, such as the determination (differentiation) of various cell types, may or may not depend upon energy-producing reactions, and that the whole problem of the energetics of development might have to be shifted back to the developing oöcyte in which protein synthesis is occurring. However, there is a possibility (which the Barths no doubt realize but do not discuss) that, even if we are able to pinpoint the detailed pathway by which the energy required for a particular differentiation process is derived, we may still be a long way from understanding the mechanism of the differentiation process itself. It seems unlikely, at least in my opinion, that the energetics of development could be importantly different from the energetics of cells in general. Whether identification of the final coupling reactions between the energy-furnishing machinery of the cell and one of its developmental processes would bring us closer to an understanding of the significant causal features of the process also seems doubtful. It would appear that the energetics of a developing organism is best thought of as an adjunct to, rather than as an integral part of, the various developmental processes. Perhaps in time we shall know whether such a point of view was justified or was merely flippant.

The second, third, and fourth chapters deal, respectively, with the storage of energy in the frog oöcyte, the release of energy during development, and the metabolism of gastrula parts. The evaluation of studies in these areas is rather critical, and the frankness with which the many problems are faced is commendable. For example, in their discussion of the respiratory metabolism of different gastrula parts, the authors come to the tentative conclusion that the modes of energy release in these developmentally very different regions of the egg are identical, and that it is in the utilization of energy that a possible mechanism for correlating metabolism with development (for example, cellular differentiation) is to be sought. They recognize (p. 64) ". . . that fundamental differences [other than respiratory] pre-exist in different cells; otherwise we cannot obtain differentiation from an equipotential system."

In the fifth and final chapter, the Barths discuss recent studies on the protein metabolism of the frog's egg, based largely on their own unpublished researches. About one-third of the book is devoted to a detailed presentation of evidence for the relationship of various extractable yolk proteins to phosphate metabolism. The authors tentatively conclude that (p. 105)

> . . . ATP may not act as a direct intermediary in the transfer of phosphate from phosphoprotein [yolk] donor to acceptor, but rather that its function may reside in a control of the amount and locus of phosphoprotein breakdown.

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New Fibres from Proteins. Robert Louis Wormell. Academic Press, New York; Butterworths, London, 1954. xx + 208 pp. Illus. $5.80.

Robert Louis Wormell has spent many years in the study and development of protein fibers in the Courtaulds organization, and one of the principal objectives of his book is to present many of the facts gathered during this experience. A second objective is to clarify existing data and to correlate it with related fields. A third purpose is to advance a new concept of protein fiber structure ("the corpuscular theory"), which pictures a protein molecule as composed of a number of polypeptide chains converging at the center of a corpuscle, rather like a dandelion flower. The book is quite broad in its coverage, including, for example, raw materials, protein denaturation and structure, general principles of protein fiber production, swelling and other physical properties of