Book Reviews

Aetiologie und Prophylaxe des Lungenkrebses als ein Problem der Gewerbehygiene und des Tabakrauches. Fritz Lickint. Steinkopff, Dresden, 1953. 212 pp. Illus. (Beiträge zur Krebsforschung ed. 2.)

This book closes with a plea for criticisms and suggestions from those interested in lung cancer, emphasizing the desirability "for objectivity in order to help the cause, rather than to do damage." Nevertheless, Lickint has written a very subjective and even passionate book, culminating in the statement that "there can be no doubt that the most promising preventive measures for cancer of the lung may be expected in the field of tobacco consumption."

In spite of Lickint's biased attitude, this book may be useful to those working in the etiology of cancer of the lung because it offers a wealth of bibliographic material not usually considered in American studies. There are some 1500 references, the majority to European sources, with a fair coverage of the Anglo-Saxon literature.

The book is divided into three main chapters: a general one dealing with statistical, ethnological, and geographic medical considerations; a "special" portion considering the etiology, which is divided into sections of infectious diseases, chemical causes, physical causes, and tobacco as a cause of lung cancer; and a final chapter dealing with prevention of cancer.

The critical reader will discard many of the arguments that tend to minimize all possible etiologic factors except tobacco. Lickint complains bitterly about the "nonsensical objections and entirely unproven assumptions" which form an "underbrush rendering further work so difficult," but he does not hesitate simply to overlook such facts as may be contrary to his preconceived idea that tobacco, particularly cigarettes, definitely causes lung cancer. In the general discussion of carcinogenesis there are some critical omissions, such as the failure to consider Sugiura's studies on carcinogenic oil derivatives, Berenblum's work on cocarcinogens, and even Potts' classical observations on soot in chimney sweeps.

The fact that Norway and Cuba are exceptions to the rule that cancer of the lung occurs with higher incidence in men than in women is simply explained away. Many inaccurate and confused statements, although not representative of the book as a whole, reflect the poor quality of its scholarship.

Nevertheless, as a source of material, particularly for the older foreign work on the subject of cancer of the lung, this book has value. It relates the interesting geographic medical observations that in Russia cancer of the lung increased in frequency even before 1900, and that in recent years it has no longer increased in the Soviet Union. It provides equally interesting observations on the epidemiology of lung cancer in Turkey before and after the introduction of cigarettes into that country.

In the chapter on experimental production of cancer with tobacco products there is a wealth of older material, largely listed without critical evaluation. Nevertheless it is presented, whereas there is a tendency in the newer American literature to omit this older material altogether.

One wonders why the furore about cigarettes and cancer has started only recently when, as appears from Lickint's book, so much information on the subject has long been available, and when alarming rises in cancer of the lung have taken place for as long a period of time as seems to have been the case.

This book, with all its shortcomings, can be helpful in providing the background information for many who are interested in studying the lung cancer problem. Because of its speculative and biased reasoning, however, it does little to clarify the question of the etiology of lung cancer. It merely obscures the issues still further with a dense screen of cigarette smoke.

The geographic location of the author may have made it wise for him to close with a quotation from I. P. Pavlov; but there is irony in his doing so because his book reads like the reaction of one who has developed a conditioned reflex against anything connected with tobacco.

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Information Theory. Stanford Goldman, Prentice-Hall, New York, 1953. 385 pp. Illus. $9.

The growing importance and vitality of information theory is amply witnessed by the appearance of this graduate-level engineering textbook. Its nine chapters begin with a chapter on information theory of discrete (spelled "discreet" throughout) systems, followed by three chapters on properties of continuous signals, ergodic ensembles and random noise, and the entropy of continuous distributions, which lay the groundwork for the next chapter on transmission of information in band-limited systems having a continuous range of values. After a short chapter on "signal space," introducing some elementary but useful concepts from the geometry of spaces of n dimensions, there are two chapters on information theoretical aspects of modulation and noise reduction and on linear correlation, filtering, and prediction. The final chapter, on divers aspects of information, is on an almost popular level. Thirteen appendixes, 11 devoted to various mathematical developments, one to solutions of some of the book's numerous problems, and one to a table of logarithms to the base 2, conclude the book.

The mathematical level should not be difficult for the average first-year graduate engineering student. Some familiarity with complex variables and Fourier methods is assumed, but the rudiments of prob-

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