Book Reviews

The Liver and Cancer. A new cancer theory. Kaspar Blond. Wright, Bristol, England, 1955. (distrib. by Williams & Wilkins, Baltimore, Md.). x + 220 pp. $6.50.

Blond presents the following revolutionary theory.

1) Only hepatopathogens are cancerogenic. Impairment of the liver's detoxifying function is followed by a rise in portal pressure, dilatation of capillaries in the alimentary organs, stasis, congestion and reversal of the blood flow. The resulting clinical syndromes are gastritis, duodenitis, pancreatitis, peptic ulcer, cholecystitis, colitis, polyposis, hemorrhoids, and so forth. Via portocaval shunts, undetoxicated metabolites enter systemic circulation, and precancerous pathology develops also in organs drained by the venae cavae. Finally, in some precancerous area the toxic metabolites induce mutation, and cancer starts growing. If it is not severely damaged, the liver is more resistant to the mutagenic action of the toxic metabolites than are other organs; hence, the rarity of hepatomas.

2) As long as the liver detoxifies satisfactorily, cancer cannot develop, because it thrives only on toxic products of digestion. Because of the limited amount of toxic metabolites, as a rule only one primary tumor grows. After removal of a primary tumor, toxic metabolites become available for areas with metastatic cells up to then dormant. It is not cancer that kills but the liver's failure, and the liver frequently does fail before cancer has developed.

3) Combat of cancer requires prevention and cure of liver damage. Surgery, irradiation therapy, and immunization are of no avail. If the liver is cured, spontaneous tumor regression follows. Skin epithelioma cannot immunize against internal cancer, because skin epithelioma is a precancerous condition, not a cancer, and because cancer is not a bacterial or viral disease.

The theory is startling and fascinating for its simplicity and scope. There are no tests available to prove or to disprove the thesis that the liver starts and keeps the ball rolling. Being aware of this, Blond amasses a large body of clinical, experimental, statistical, and biochemical findings in agreement with, and in support of, his theory. It is circumstantial evidence. Not all of his interpretations are convincing, but some are more probable than the currently accepted explanations. I feel gratified that within 2 years my own book, *Cancer in Man,* has inspired this surgeon in London to discuss it thoroughly, to accept some conclusions, to modify or reject others, and to develop a new unified cancer theory. The merits of the latter will have to be assessed at another occasion.

SIGISMUND PELLER

New York, N.Y.

Stochastic Models for Learning. Robert R. Bush and Frederick Mosteller. Wiley, New York; Chapman and Hall, London, 1955. xvi + 365 pp. Illus. $9.

In this volume the authors present a general mathematical model for learning, where learning is defined as "any systematic change in behavior . . . whether or not the change is adaptive, desirable for certain purposes, or in accordance with any other such criteria" (page 3). Because behavior is viewed as a statistical phenomenon, the mathematical system presented is a probabilistic one.

The organization of the volume follows the three main steps in the construction of a mathematical model—setting up the mathematical system, identifying the elements of the system in terms of certain variables in the learning process, and applying the system to specific problems. Part one deals with an exposition of the system whose basic elements are a set of mutually exclusive and exhaustive alternatives, a vector of probabilities with one element for each alternative, a set of mutually exclusive and exhaustive events, and a set of operators corresponding to these events. An element of the probability vector represents the probability of the occurrence of the corresponding alternative when there is an opportunity for choice among the alternatives. The occurrence of an event implies that the corresponding operator, represented by a stochastic matrix, is applied to the set of probabilities to yield a new set of probabilities. Various consequences of the mathematical system are examined under various assumptions regarding the parameters of the system. Monte Carlo methods—or "stat-rats"—are described which may be used to obtain approximate values of the moments and other characteristics of the probability distributions arising from the model.

In the discussion of identification, the question of estimating the parameters of the system is covered, as well as the definition of the parameters in terms of the psychological variables. Although maximum likelihood estimates are considered desirable, the difficulty of computing such estimates leads the authors to some interesting approximation procedures. Finally, the model is applied to data taken from several types of learning experiments—verbal learning, avoidance training, imitation, and so on.

Although they demonstrate that their model works fairly well in some experiments, the authors, in an excellent concluding chapter, discuss the shortcomings of this model. The inability of the model to handle response intensity—that is, a response beyond the occurrence or nonoccurrence of a response class—and the assumption of linearity of the event operators are recognized and discussed by the authors as two limitations on the "generality" of their model. The discussion of the relationship between model building and curve fitting is an excellent one and, together with the introduction, is an interesting—if too brief—presentation of the purpose, methods, and usefulness of mathematical model building. While the authors are rightfully modest about the general applicability of their model to learning problems, they have added substantially and significantly to the literature of mathematical models in the social sciences.

IRVING ROSHWALB

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Principes Fondamentaux de Classification Stellaire. Colloques, Internationaux du Centre National de la Recherche Scientifique. Le Centre, Paris, 1955. 188 pp. Illus. F. 1.200.

A conference on stellar spectroscopy from the point of view of stellar classification was held at the Astrophysical Institute in Paris in the summer of 1953, and this book gives an account of the papers presented, together with the comments made at the time by the participants. There are contributions from American, Danish, Dutch, and Soviet astronomers in addition to those of the French hosts, and all papers with comments have been translated into French.

Apart from various short remarks, there are 15 papers, ranging from a clear account of the current theory of the spectral-type by Pecker in which the many difficulties are emphasized, to an important discussion by Strömgren of his work on a two-dimensional classification of F-type stars using photoelectric photometry with interference filters.

Among the other contributions, Morgan has a short discussion of the problem of the spectral classification of the two stellar populations. Deutsch, in a paper illustrated with Palomar coudé spectrograms, reports on observations related to stars that are members of open or globular clusters; he discusses among other things the distribution of rotational velocities in stars of early type. Barbier has an interesting account of the use of the position and magnitude of the Balmer discontinuity in spectral classification, while Chalonge proposes to make the Morgan-Keenan system more precise by the introduction of a third parameter, the absolute gradient in a prescribed spectral region.

Certain problems became apparent during the discussion. For example in Chalonge's three parametric classification system, it happens that high-velocity stars differ systematically from low-velocity stars. This is a special case of the general problem of finding more fundamental relationships between spectral-type properties of stars and their other characteristics, such as rotation, space motion, and light variability. Such relationships when found might serve to unify somewhat the various families in which stars are now divided. This book can be recommended to students of stellar spectroscopy and statistics as giving an account of the many problems current in this field.

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The Flood Control Controversy. Big dams, little dams, and land management. Luna B. Leopold and Thomas Maddock, Jr. Ronald Press, New York, 1954. xiii + 278 pp. $5.

Free enterprise implies the assumption of risk. But we have long since abandoned the idea of unlimited risk, preferring some degree of control in the interest of general welfare. A nice problem arises, however, in deciding upon the extent to which general versus special interest is to be served when fiscal and legislative measures for minimizing risk are proposed. Certainly there has been an increasing drive on the part of special groups in industry, business, and agriculture to eliminate, at public expense, any risk so far as they are concerned.

Flood control, so-called, is an excellent case in point, now absorbing expenditures in the billions of dollars. Quite apart from immediate administrative and technical considerations, this activity involves principles that impinge upon the character and destiny of our national life. The Conservation Foundation, dedicated to the conservation of renewable natural resources, has performed a notable public service in making possible the writing of *The Flood Control Controversy,* in every way an unusual book. Leopold and Maddock, on leave, respectively, from the U. S. Geological Survey and Bureau of Reclamation, have had access to many unpublished records and to comment from government officials. Their fitness is further evident from the clarity and power of their writing and the competence with which they have analyzed and presented matters of great technical complexity. Flood control, they point out, is itself a misnomer. What is really involved is the reduction of flood hazard and damage. The basis of the problem lies in the competition between cultural and geologic processes. Channel and floodplain are alluvial phenomena, "creatures" of the river. At the same time valley lands are often highly productive for agriculture and convenient for urban development. In principle their use by man involves hazard and should be regarded as a calculated risk, like the establishment of vineyards on the slopes of a volcano. A sardonic footnote on the intensity of urban use comes from the fact that prudent investors may avoid flood risk, making lowlands inexpensive and attractive to others. Again, the erection of flood "control" works may result in false optimism and increased intensity of use. Thus the process of protection naturally leads to the necessity for still further protection.

Under a concept that has been growing since the 1930's remedial measures are no longer a charge against the direct beneficiaries but against the commonwealth. Further, the alienation of space for engineering works disrupts the economy upstream from those benefited—a situation that would not have been tolerated prior to 1900 when economy and politics were still largely rural.

Even today it meets with protest, manifest as the little dam–big dam controversy, essentially the subject of this book. As one who welcomed a reexamination of the almost exclusively engineering philosophy as applied to watersheds and attacked in Elmer Peterson's *Big Dam Foolishness* [*Sci. Monthly* **81**, 43 (1955)], I regret that *The Flood Control Controversy* was not available when Peterson wrote his lively polemic.

Responsibility for minimizing flood damage is divided between two agencies —Army Engineers and the Department of Agriculture. The Army Engineers work upward from the lower channels where flood damage has high visibility and where they have been traditionally engaged in improvement of navigation. In a sense they typify urban pressures. Agriculture is assigned to work downward from the headwaters and obviously spearheads the rural viewpoint. Having realized that improved land use and land management can alleviate, but not control, the flood problem, the Department of Agriculture has ventured into the engineering field with headwater dams. Thus we have, over and above any conflict of philosophy, a tangible one of jurisdiction.

As the authors take care to point out, neither approach is a substitute for the other. To the degree that flood "control" measures can be justified (and this is by no means yet clear, either from the facts or from the present allocation of costs) the downstream and upstream approaches are complementary. There is no question that, under any type of valley management, exceptional patterns of rainfall may get a drainage system out of hand. Nor should there be any question regarding the need for a watershed under sound land use and management before costly and permanent engineering works are set up downstream. I hold painful recollections of the Grand River fiasco, in which my advice to safeguard any dam by an initial program of soil conservation was summarily rejected.

As the authors say, flood "control" is now big business. It is up to those who foot the bill to control the "control," and a practical first step for the citizen is to read this excellent book. A further step, devoutly to be wished, is for more men in responsible places to develop the same broad combination of engineering discipline and biological insight as Leopold and Maddock.

Perhaps it is not too much to hope that they can be induced to apply their gifts to a similar analysis of the irrigation and reclamation problem, which up to the present has seemed highly elusive.

Three very minor points may be mentioned in concluding this review. The technical distinction—and it is important—between land use and land management is somewhat blurred. The alleged effect of levees in raising the stream-bed level is not discussed. And finally in accepting present patterns of land use as more or less economically necessary, no account is taken of the recent remarkable progress of the art of grass farming or of the artificial effects of crop subsidies. But these matters are more than offset by the authors' clear and repeated insistence on the need for more fundamental and more long-continued research. One of the tragic costs