Book Reviews

Cancer: radiations, virus, environment. (Vol. II.) J. Maisin. Paris, France: Casterman, 1949. Pp. 306. 120 fr.

Volume II, comprising Chapters V to VII of Dr. Maisin's treatise on cancer, is a critical review of the literature on the relationship of radiations, viruses, and environment to cancer.

The importance, in the etiology of cancer, of various agents, such as X-rays, radioactive substances, ultraviolet light, certain animal parasites, coal tar, and some hydrocarbons which produce prolonged or chronic irritation is now generally recognized. Cutaneous contact with solar rays or X-rays causes cancer of the skin. Inhalation of radioactive substances causes cancer of the lung. Ingestion of radioactive substances causes cancer of the bone. These phenomena belong to the category of environmental cancer. Dr. Maisin believes that cancerization by these rays, whether internal or external, is the result of mutation of normal cells into neoplastic cells. Another characteristic property of all the cancers caused by radiation is a long period of latency. In man, this period is from 10 to 20 years (from the last irradiation to the onset of the cancer). It seems, therefore, that the cell which has undergone mutation rests dormant for years without division. The altered gene, one could call a mutagene. The atomic bombs that wiped out the cities of Hiroshima and Nagasaki in 1945, although they spared a certain number of humans, different species of animals, and numerous plants, have tragically placed these survivors under ideal experimental conditions for the study of the mutagenic action of penetrating rays. All have been largely irradiated with sublethal doses of α, ß, and γ rays. It will be of great value to observe what becomes of their descendants. The accident having occurred, it will be a pity if science cannot profit from it.

It is now well recognized that cancer in animals can be caused by parasites *Gongylonema neoplasticum*, and *Cysticercus fasciolaris*, and by viruses—Rous chicken sarcoma, Fujinami fowl myxosarcoma, Shope rabbit papilloma, Lucké frog kidney carcinoma, Bittner mouse breast cancer, and Yoshida rat ascites sarcoma. (YOSHIDA, T., MUTO Y., and SASAKI Z. *Proc. imp. Acad., Tokyo*, 1944, *20*, 611. Note by K. Sugiura.) However, there is no evidence that cancer in man is caused by parasites or viruses, although this assertion has been made frequently. Carcinogenic parasites or viruses themselves would not be able to initiate a malignant tumor if the environment and genetic factors of the host were not favorable.

Although cancer is not properly termed an hereditary sickness, heredity plays an important role in the genesis of cancer. In certain types of cancer, hormone influence also plays a role in the formation of malignancy. Without this hormonal influence, in spite of heredity, these cancers will not appear. The influence of external environment in the development of human cancer has long been recognized. Percival Pott, in 1775, noted that cancer of the scrotum was unusually common among chimney sweeps. Subsequently, various environmental or occupational cancers have been described. Thus cancer of the skin, lung, and bone by contact with radioactive substances and X-rays; cancer of the scrotum, face, hands, bladder, and liver by contact or ingestion of hydrocarbons; and skin cancer by solar rays. Thus a number of human cancers are known to be of extrinsic origin, but a substantial proportion can be prevented by environmental control in industry.

Finally, Dr. Maisin hopes for discovery of a "penicillin or sulfonamide" for cancer cells. He thinks, however, that the discovery of a carcinolytic substance is further off than the means for the ultimate prevention of cancer.

Dr. Maisin deserves to be congratulated for this valuable addition to cancer literature, and students of cancer may greatly profit from it. The bibliography includes 739 papers, written by 626 individuals and joint authors. The first four chapters, treating the subject of heredity, hormones, and carcinogenic substances, form Volume I of this work.

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Human ancestry from a genetical point of view. R. Ruggles Gates. Cambridge, Mass.: Harvard Univ. Press, 1948. Pp. xvi + 422. (Illustrated.) $7.50.

Nowadays a book on human evolution has a definite reader appeal. This fact imposes on the author a demand for a generally high level of performance—quite apart from his obligation to anthropology, to the reader, and to clear, simple writing. We have every right to expect authoritative reporting and objective interpretation. There are certain descriptive facts concerning fossil man and modern races that are the common possession of the literature in this field and these can be brought together with reasonable facility. It is not so much, therefore, the assembling as the interpreting that becomes important.

Human ancestry does not fulfill this demand. It is unevenly written; one has the feeling that it was written in spurts, with parts, or even whole chapters, inserted as afterthought. Well-established evolutionary concepts are presented almost as though they were unique to the present volume. For example, much is made of "parallel evolution" as a relatively neglected avenue of interpretation; yet Le Gros Clark for the Primates and Olson for the mammals have developed this theme in precise detail.

The lay reader will be dismayed by the interjection into an acceptable literary style of very technical botanical and zoological material as evidence to support sweeping generalizations. The result is rather like encountering a number of road repair and detour signs along a fine concrete highway.

Prof. Gates insists that there are five species of living *Homo: H. australicus, H. capensis, H. africanus, H. mon-*

goloideus, and *H. caucasicus.* In so doing he chooses to disregard the concept of mutual interfertility. He neglects also the earlier statement of Georges Puchet (*ca.* 1860) that "either we must admit different species in the genus *Homo,* or we must entirely revise zoological classification."

This reviewer is not so much concerned with the establishment of five human species as with the attitude, the conceptual values, behind it. The whole thing has an air of a racial (specific) hierarchy, a "superior-inferior" categorization. The sequential build-up is clear: "This eighteenth century political doctrine [that 'all men are born free and equal'] is hopelessly at variance with the facts of science. . . ." (p. 114); "there is no question of the inheritance of mental abilities and disabilities" (p. 145); " . . . the mental differences between races remain and cannot be gain-said" (p. 367). The reader is led, even though perhaps unconsciously, into a racist patterning of thought, both culturally and biologically.

The fact that this is a "bad" book is, in a sense, beside the point. What really matters is that it is *not* a "good" book. It should have been; with more care and objective thinking it could have been.

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Cosmic ray physics. D. J. X. Montgomery. Princeton, N. J.: Princeton Univ. Press, 1949. Pp. viii + 370. (Illustrated.) $5.00.

A great number of physics students are nowadays turning to the subject of cosmic rays, and for some years there has been a serious need for a textbook to introduce the subject to them in their first or second year of graduate study. The need has been particularly urgent because of the lamentable state of periodical literature on cosmic rays. There is a bewildering profusion of articles on the subject—articles written in many languages, scattered throughout many journals, and full of mistakes and contradictions that a beginning student cannot be expected to sort out for himself.

Cosmic ray physics, by D. J. X. Montgomery, fills the need for such a textbook reasonably well and therefore will be heartily welcomed. It is easier to read than the recent book *Cosmic rays,* by L. Janossy (Oxford, 1948), and it is much more accurate and up-to-date than the few earlier books. Its major emphasis is on the principles underlying cosmic-ray experiments and the interpretation of experimental results. In contrast to Janossy's book, theoretical calculations are in general omitted, although the theoretical methods are broadly sketched in a qualitative fashion and some of the results of theoretical calculations are presented. The book offers little in the way of original contribution or information not published elsewhere, but is rather a survey of the cosmic-ray work up to 1948. One of its outstanding features is its exhaustive lists of references.

Montgomery's book was begun on the basis of a series of lectures on cosmic rays given by Marcel Schein at Princeton in 1946. Since then, however, the volume has been much amplified; many more recent experimental results have been incorporated, and notable contributions have been made by Niels Arley and by the late Shuichi Kusaka. Thus the author has been guided by specialists in both the experimental and theoretical branches of the subject.

There are, unfortunately, some errors in the book, and the author has occasionally taken a too credulous attitude towards an experiment or a theory. The references sometimes make no distinction between good work and bad. These, however, are not general characteristics. More commonly, Montgomery has adopted a healthy, critical view of published results, and has successfully weeded out errors. The occasional one remaining may serve as a teaching aid by stimulating students to read more carefully and critically than they would if they expected the text to be infallible.

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The pulsation theory of variable stars. Svein Rosseland. New York: Oxford Univ. Press, 1949. Pp. viii + 152. (Illustrated.) $5.00.

The wealth of unanswered questions regarding the giant stars in general and the pulsating giants in particular has attracted many astronomers in recent years to work on stellar pulsations. This work, however, has not yet given final answers to most of the essential questions. Under these circumstances the task of summarizing the present status of the pulsation theory is both extremely useful and very difficult; useful, because it may do much to stimulate the further research that is needed, and difficult, because definite facts are few to report, and many parallel investigations must be described whose relative values cannot yet be ascertained. Professor Rosseland has undertaken this task in spite of its difficulties and has completed it with singular success.

The first three chapters of the book contain the history and the basic elements of the pulsation theory. The following chapters describe the more recent developments, such as pulsational stability, the form of the pulsations in the outer parts of a star, and the effects of the nonlinearity of the basic equations. These topics are presented in a uniform and elegant mathematical form. The reading of these chapters may seem to require an appreciable effort. However, this effort should be small compared with that necessary to understand some of the original papers. The final chapter presents a comparison of the present pulsation theory with the observational data on certain critical points.

The chapter next to the last contains a discussion of shock waves. Since the book was published, the timeliness of this discussion has been amply demonstrated: new observational evidence obtained at the Mt. Wilson Observatory indicates that for some stars the pulsation in the atmosphere does indeed take the form of a shock wave.

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