

and well supplied with cross-references. Its great virtue is that it proclaims the important matters on which we are ignorant, and does not somehow convey the idea, as other writers on the nervous system, no doubt unintentionally, have sometimes done, that our understanding is all but complete. By this frankness it hopes, and is likely, to stimulate research. It is the fruit of more than twenty years practical work, thought and reading by both authors. It could not possibly be mistaken for a mere journalistic compilation.

C. G. PHILLIPS

CLINICAL AND EXPERIMENTAL CANCER RESEARCH

Carcinoma of the Lung

Edited by J. R. Bignall. (Monographs on Neoplastic Disease at Various Sites, Vol. 1.) Pp. xii+298. (Edinburgh and London: E. and S. Livingstone, Ltd., 1958.) 55s. net.

Variables Related to Human Breast Cancer

By A. Elving Anderson, Harold O. Goodman and Sheldon C. Reed. (A Study from the Dight Institute of Human Genetics.) Pp. xiii+172. (Minneapolis, Minn.: University of Minnesota Press; London: Oxford University Press, 1958.) 32s. net.

Proceedings of the Second International Symposium on Mammary Cancer

Held at the University of Perugia, 24th to 29th July, 1957. Edited by Lucio Severi. Pp. liv+871. (Perugia: Division of Cancer Research, 1958.) 12,000 lire; 145s.; 20 dollars.

THREE recent books illustrate a current trend towards the detailed study of neoplasia in particular organs or tissues in human beings as well as in animals. Carcinoma of the lung is the subject of the first of a series of monographs designed to cover the range of neoplastic disease in special sites. The series is based primarily on the first-hand clinical experience of a group of postgraduate teaching hospitals in London supplemented by expert aid from other sources. The present volume, reflecting the practice of the Royal Marsden and Brompton Hospitals, includes a discussion of etiology, occupying about one quarter of the whole, by R. Doll. Dr. Doll expounds his views on the etiological importance of cigarette-smoking lucidly and persuasively. The weakest link in the argument seems to be the identification of the mechanism of carcinogenesis; the evidence for decisive operation of carcinogenic hydrocarbons is unconvincing. The main thesis rests on information about what actually happens in human beings, and although Dr. Doll is convinced by the evidence incriminating cigarette-smoking, he recognizes that inconsistencies persist and that interpretation is difficult.

The intrinsic hazards in the study of the etiology of human neoplasia are well shown in a report from Minnesota of a careful and critical investigation of the role of genetic factors in cancer of the human breast. The authors give especial attention to the validity of research methods; many previous investigations are clearly inadequate. Their own conclusions are cautious. They find good evidence that mothers, sisters and daughters of breast-cancer patients are about twice as liable to cancer of the breast as other women of similar age, and that the enhanced liability does not apply to cancer at other

sites. Genetic factors are probably involved in the etiology of human breast cancer but are less important than non-genetic factors. These investigators are not satisfied that information now available about such factors as marital status, number of pregnancies and breast-feeding is sufficient to justify the advocacy of prophylactic measures, and they show a welcome recognition of the danger of meddling with the lives of human beings on the basis of imperfect and incomplete understanding of neoplastic processes in the breast.

The limitations of knowledge are also evident in the report of the Second International Symposium on Mammary Cancer held in Perugia in 1957. More than eighty contributions from fifteen countries cover a wide range of observations and opinions, human and animal studies being about equally represented. The endocrine aspects of mammary cancer receive most attention. Although there is wide agreement among the contributors that hormones are important in the etiology of cancer of the human breast, the mechanism of their action is not known. Moreover, the endocrine management of advanced breast cancer remains almost wholly empirical. These matters call for the closer integration of clinical and experimental research which this valuable symposium was designed to encourage; the clinical and experimental approaches are complementary and not alternative or competitive. The report scarcely does justice to the value of a symposium that brought clinical and laboratory workers together for informal discussions as well as formal expositions, but it is welcome, nevertheless, as a record of current thought and research on mammary neoplasia. All three books may be commended as valuable contributions in their several ways to the study of a subject of great complexity.

L. FOULDS

MECHANISM OR VITALISM?

The Physical Foundation of Biology

An Analytical Study. By Prof. Walter M. Elsasser. Pp. x+219. (London and New York: Pergamon Press, 1958.) 30s. net.

THE conflict between mechanistic and vitalistic philosophies has never quite subsided. Biologists, who on the whole have a profound respect for the senior physical sciences, tend to hold mechanistic views, at least as a working hypothesis, while physicists, knowing rather more of the limitations of their own discipline, are more inclined to assign special properties to living organisms. Prof. W. M. Elsasser, whose professional domain is magneto-hydrodynamics, has taken great pains to survey those phenomena displayed by living creatures which can be described in mechanistic terms, so as to identify the residue of functions which, he asserts, cannot be effected by physical means. For phenomena in this class, which cannot be interpreted in terms of pure mechanism, he proposes the term 'biotonic', which he defines as "Any causal relationship which involves an increase of information content in the system with the passage of time". The most prominent member of this class, he suggests, is organic growth of information, and he tries to show that neither genetic nor cerebral information can conceivably be "stored" in a physical sense, because of the minute scale of the structures involved—the chromosomes of the gametes or the nerve tissue of the brain. In an artificial computing machine there may