energetic direction of another medical officer of the Board, Sir Arthur Newsholme, the first State social health services were founded.

This is a valuable and excellent biography of one of England's greatest benefactors. ARTHUR MACNALTY

TREATMENT OF CANCER

Biotherapy of Malignant Tumours

By N. G. Klyuyeva and G. I. Roskin. Translated from the Russian by J. J. Oliver. Translation edited by Dr. W. J. P. Neish. Pp. ix+315+132 plates. (London and New York, Pergamon Press, 1963.) 80*s*.

SINCE the early work of Coley at the end of the nineteenth century, reports have frequently appeared suggesting that the growth and development of malignant disease may be modified significantly by certain intercurrent infections or by various microbial products. In recent times numerous low molecular weight products of microbiological origin have been isolated, chemically characterized and shown to have carcinostatic properties in animals and in man. These relatively simple substances are, however, only part of a much broader spectrum of natural products to the therapeutic use of which the authors of this Russian work apply the general term "Biotherapy". Within this definition they include the use of such diverse agents as viable micro-organisms pathogenic or otherwise, microbial toxins, lysates and filtrates, oncolytic viruses, bacteriophage, yeast and fungal products and related materials of greater complexity and less well defined than the simple carcinostatic antibiotics. The preliminary chapters of the book are devoted to brief reviews of these topics, reviews which in many instances are out-dated at the present time due to the six-year delay that has occurred between the publication of the original Russian text and the appearance of its translation.

A primary object of this book is to present the experience that the authors and their clinical colleagues accrued over the period 1946–57 in the use of *Trypanosoma cruzi* extracts (cruzin) in the treatment of human cancers, particularly of the lip and breast. This they have done by way of detailed case reports supplemented in the English translation by a selection of the results obtained more recently by French investigators utilizing similar *Trypanosomal* products. The authors claim that complete regression can be induced in a proportion of human malignancies of various types and localization by prolonged administration of the extracts and that the treatment can be effective against primary, secondary and recurrent growths with no detectable pathological effect on the function or structure of normal tissues. In cases of advanced inoperable disease, a transition to an operable condition may occasionally arise and likewise, where possible, surgical intervention during the course of treatment may accelerate the process of oncolysis.

In subsequent chapters the authors describe the histological and cytological changes induced in malignant tissues of both human and animal origin under the influence of *T. cruzi* extracts. They describe a complex series of changes in the growth characteristics of tumour tissues in which the cells undergo progessive diminution in nuclear and nucleolar sizes, in mitotic activity, in ribonucleic acid content and protein synthesizing ability. They believe that this process of 'normalization' and 'loss of aggressiveness' leads to the establishment of a new relationship between erstwhile malignant tissue and the normal body defence mechanisms. Subject to the degree to which this process can be established, there follows a subsequent reaction in which the tumour region is invaded by cells of the reticulo-endothelial system leading to the destruction of tumour cells and their replacement by connective tissue as the final act of the carcinolytic process where this goes to completion.

To the experimentalist, it is perhaps unfortunate that much of the earlier work leading to the present clinical investigation was published in a volume under the same title by the authors in 1946 and will not be readily available to Western investigators. Nevertheless, the present observations are of interest to oncologists generally, particularly to those interested in the immunological aspects of cancer.

C. L. LEESE

TRENDS IN CANCER RESEARCH

Advances in Cancer Research

Vol. 7. Edited by Prof. Alexander Haddow and Sidney Weinhouse. Pp. ix+599. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1963.) 128*s*. 6*d*.

Canadian Cancer Conference

Proceedings of the Fifth Canadian Cancer Research Conference, Honey Harbour, Ontario, June 10–14, 1962. Edited by R. W. Begg, C. P. Leblond, R. L. Noble, R. J. Rossiter, R. M. Taylor and A. C. Wallace. Pp. xii+479. (New York: Academic Press, Inc.; London: Academic Press Inc. (London), Ltd., 1963.) 100*s*.

THE present volume of *Advances in Cancer Research* contains seven chapters. Beard discusses at considerable length our present knowledge of avian virus tumours, while Negroni, in a shorter chapter, presents information about rabbit and mouse tumour viruses as well as chicken tumour viruses and 'passenger' viruses, such as Riley's Agent. In a long chapter, Brockmann deals with the mechanisms of resistance to anti-cancer agents, and questions of cross-resistance and collateral sensitivity in cancer chemotherapy are considered by Hutchinson. These chapters should be of considerable interest to workers directly concerned with virus tumours and chemotherapy.

Of more general interest perhaps is an analysis by Kotin and Falk of the contribution of atmospheric factors in the pathogenesis of cancer of the lung. Farber has surveyed the carcinogenic properties of ethionine and concludes that its activity may be due to its ability to produce altered DNA and/or RNA within the cell. At last, according to Farber, there is some factual support for hypotheses that altered chromosomal or extrachromosomal nucleic acids play a key part in cancer production. In a short chapter, Court Brown and Tough present the interesting work of their group in Edinburgh and of a group of workers in Philadelphia on the discovery of an abnormal chromosome Ph^1 in the marrow cells of patients with chronic myeloid leukæmia. This specific chromosomal abnormality seems to be closely connected with the primary cause of the disease.

Volume 5 of the *Canadian Cancer Conference* presents sets of papers devoted to cellular organization, cell interaction, immunology and chemotherapy. The scope of this work is more general than that of the present volume of *Advances* and it will probably appeal to a wider audience of cancer workers.

In the section on cellular organization, consideration is given to the mode of formation of polypeptide chains and to the comparative molecular biology of virus and cellular nucleic acids. Autoradiographic investigations which deal with the sites of ribonucleic acid and protein synthesis in the cell are presented, and Ochoa discusses the nature of the genetic code. Interaction of viral ribonucleic acid with mammalian cells is described, and Leslie deals with the control of gene expression which may be influenced by histones. In an interesting discussion of chromosomes and carcinogenesis Stich concludes that a genetic concept of cancer must be given consideration, but the question still remains as to whether chromosomal changes in early neoplasia are cause or consequence of cancer formation.