

contractile mechanisms involve conformational changes".

H. E. Huxley contributes an excellent paper on the work he and his colleagues are doing at Cambridge. He presents many of his recent results from X-ray diffraction studies with living muscles, all of which have now been published in detail elsewhere. G. F. Elliott describes experiments with striated muscle on the separation of the actin and myosin filaments as a function of pH and the ionic environment. This work was done by Elizabeth Rome. Based on the interpretation of her results, Elliott suggests that the forces involved in contraction may be of the type usually present in colloidal systems. Betty Twarog discusses the problem posed by the functioning of molluscan "catch" muscle. She proposes a Ca^{++} dependent mechanism which assumes no special role for the protein tropomyosin A. In a very thoughtful paper Teru Hayashi examines the possibility that local changes in the structure of actin filaments may occur during the contractile process. Pringle's article on the evidence from insect fibrillar muscle about the elementary contractile process can confidently be recommended as an exceptionally deep-searching and scholarly attempt to envisage the operation of the sliding filament mechanism in striated muscle.

The most interesting paper in the section on non-muscular contractile systems is that by Inoué and Sato who reviewed work on the structure of the mitotic spindle and its relation to mitotic chromosome movements. The contributions by Rebhun (structural aspects of saltatory particle movement) and Satir (morphological aspects of ciliary motility) contain more than the usual amount of speculations. It would have been more useful to have had a survey of Gibbons' recent work on the proteins of a protozoan ciliary system.

Introducing this session, Mazia remarks that people working on non-muscular contractility can "expect soon to be in the same position as that of students of muscle contraction: that of knowing almost everything about the system except how it actually moves". This assessment is wide of the mark. There can be little doubt that the understanding of muscle we now have is based on very intensive and detailed studies and that our relative ignorance about non-muscular contractile systems is simply due to the fact that they have not yet been investigated so thoroughly. Here it might also be pointed out that we know more about striated muscle than about all other muscle types put together. The papers collected in this symposium demonstrate convincingly that it will be a long time before we can make meaningful generalizations about the mechanism of muscular contraction, let alone about the contractile process.

J. LOWY

IMMUNOLOGY AND CANCER

An Immunological Approach to Cancer

By H. N. Green, Honor M. Anthony, R. W. Baldwin and J. W. Westrop. Pp. ix+321. (London: Butterworth and Co. (Publishers), Ltd., 1967.) 95s.

In the foreword to this book Sir Alexander Haddow points out that of all the approaches to the cancer problem the immunological attack possesses a unique attraction and logic. It was in 1954 that Professor H. N. Green put forward a new concept of carcinogenesis with an immunological bias suggesting that the malignant behaviour of cells is due to the loss of tissue specific antigens, as a result of which the cells lacking immunological identity of tissue-type become independent of homeostatic growth control mechanisms. The theory raised controversy and stimulated investigation into the immunological aspects of cancer. The book under review is an analytical survey of the many observations made since 1954 which, either directly or indirectly, have some bearing on this concept

The three co-authors present the relevant information objectively, though many of the inferences drawn by them are biased in favour of Green's immunological concept. The seven chapters, each covering about fifty pages, deal with the subject from various aspects.

Dr Honor M. Anthony gives a description of the various immunological mechanisms by which foreign cells are destroyed and of the ways in which aged, altered or displaced cells are recognized and eliminated by the organism. She draws attention to the association of certain autoimmune diseases and cancer, and argues that autoimmune attack at the tissue specific site can lead to the loss of components in the tissue through which growth control of the tissue is exerted.

Dr J. W. Westrop deals competently with the modification of cell protein by carcinogens; his chapter is one of the most informative in the book and contains more than 300 references. The evidence collected by Westrop demonstrates a correlation between carcinogenesis and covalent binding of carcinogens to cellular components, principally DNA, RNA and protein. It seems that practically all chemical carcinogens attach to these macromolecules. The question is what is the significance of covalent binding as regards carcinogenesis; at present no definite answer can be given to this question. The author discusses at length the studies of Miller and Heidelberger, demonstrating that proteins are deleted from cells which have been exposed to aminoazo dyes and polycyclic hydrocarbons, and considered by him as proof of the immunological concept of cancer.

In another chapter Dr R. W. Baldwin adequately reviews the evidence of antigenic modification in tumours. The difficulties of demonstrating antigen deletion or simplification during carcinogenesis and identifying new antigens in the transformed cells, are described. The author marshals a great body of evidence, indicating the presence of tumour specific antigens both in experimental and certain human tumours and discusses the various speculations put forward to explain their nature and function. According to Dr Baldwin the available information indicates that "the loss of surface components of cells with tissue specificity seems to be more critically associated with neoplasia than gains in antigenicity".

In the last chapter the late Professor Green attempted to accommodate his theory with the many recent findings of tumour immunology and tissue transplantation. This chapter may stimulate further experimental work, and lead us to reinvestigate those principles which could govern our approach to the immunotherapy of tumours.

Though readers may be reluctant to accept the authors' conclusions the book is a source of information which is relevant to the immunological aspect of cancer, each chapter contains many references which are up to date and will be a useful aid to research workers.

P. C. KOLLER

CANCER CONGRESS

Proceedings of the 9th International Cancer Congress, Tokyo, October 1966

Congress Lectures and Official Speeches. Edited by R. J. C. Harris. (UICC Monograph Series, Vol. 9.) Pp. viii+126. 28 D.M.; \$7. Panel Discussions. (UICC Monograph Series, Vol. 10.) Pp. xii+288. 68 D.M.; \$17. (Berlin and New York: Springer-Verlag, 1967.)

THE 1966 International Cancer Congress was notable for the high standard of the lectures and of several of the panel discussions.

The conference lectures form the main part of the ninth volume of the UICC monograph series. This begins with two contributions by Harold L. Stewart (Bethesda), a tribute to Harold Fred Dorn entitled "The making of a Biometrician" and an appraisal of present knowledge,