

BOOK REVIEW

Cell Physiology of Neoplasia. 653 pp., 1960. **The Molecular Basis of Neoplasia.** 614 pp., 1962. M.D. Anderson Hospital and Tumor Institute, University of Texas Press. \$10.50 each.

BOTH of these Symposia reports have distinguished contributors and are well produced and indexed—although it is quaint that they are apparently edited by a Hospital. Both books reflect the over-ambitious aims of the respective Symposia.

The vagueness of the discipline “cell physiology” partly accounts for the heterogeneity of the former volume. At first sight, the emphasis on abnormalities of nuclear and nucleolar morphology, as mentioned by, *inter alia*, T. Caspersson and co-authors, may seem unappetizing reading to biochemical pharmacologists. But M. Harris and F. H. Ruddle, in their article on drug-resistant cell lines from kidney, conclude that their experiments within their limitations “provide no evidence that structural rearrangements at the chromosomal level are a necessary mechanism in the origin of drug resistant variants”. Moreover, in an article which includes striking evidence for a year-to-year variation in the modal chromosome number of the Walker-256 carcinoma, P. C. Koller writes: “Variation in chromosome numbers occurs in tumor cells, not because it matters more than in normal cells but because it matters less. . . . Neoplastic transformation cannot be attributed to a ‘single-stage’ event. . . . The cytoplasm and its components can play a role just as important as that of the nucleus.”

From the contributions by S. Kit and W. S. Beck on RNA (Beck’s article being admittedly a review rather than an original contribution), it is evident that little is known concerning the role of RNA in neoplasia. These articles excepted, the Cell Physiology volume is almost lacking in biochemistry; one can hardly dispute E. V. Cowdry’s view (in his lecture on “The lives of cancer cells”) that biochemical studies have given valuable information but are vitiated by the cellular heterogeneity of the material studied. The histochemical approach is, of course, not open to this objection, but is at present descriptive rather than quantitative. There are two excellent histochemical contributions which could usefully have been juxtaposed, concerned mainly with transplanted hepatomas (A. B. Novikoff) and precancerous liver (J. P. Chang); Novikoff attempts to relate the pattern of results to the actual degree of malignancy.

Even cell physiologists may find the contents worth a dip but in general diffuse and unsatisfying. There seems to have been a random choice and distribution of articles on “basic” topics, such as the nuclear envelope (M. L. Watson) and chromosome duplication (J. H. Taylor).

The word “basis” in the title of the second volume, and the fairly comprehensive coverage of topics ranging from haemoglobins (V. M. Ingram) to vital-dye uptake by viruses (H. D. Mayor), perhaps justify the remarkable lack of emphasis on neoplastic as distinct from normal cell function. There is an understandable emphasis on nucleic acids and on control mechanisms, but a somewhat odd arrangement of contributions; for example, S. Kit’s physicochemical work on DNA and W. Szybalski’s work on DNA containing halogen substituents come under “Nucleic acids and proteins” rather than “Nucleic acids”. Kit remarks: “. . . it seems unlikely that gross differences exist between the DNA of normal tissues of the same animal or between the RNA of normal tissues and tumors”. Szybalski makes the intriguing suggestion that the introduction into DNA of moieties such as 5-chlorodeoxyuridine (unhappily abbreviated as CUDr) could be a means of making tumours radiosensitive.

L. F. Cavalieri and B. H. Rosenberg question the Watson-Crick hypothesis that each DNA molecule contains only two strands and that these separate during replication; they argue that there are two *pairs* of strands, at least in some organisms. Articles such as this make it particularly regrettable that the volume lacks verbatim reports of the informal discussions, as given in the Cell Physiology volume. In his article on nucleoprotein structure, G. Zubay touches on neoplasia only speculatively: “. . . possibly in a cancerous cell the arrangement of the histone becomes disturbed so that the disposition of active or inactive DNA regions is altered”.

There is the inevitable section on ribosomes; perhaps the most novel contribution is that of D. H. Ezekiel on RNA synthesis by bacterial nuclear preparations. In the difficult field of control mechanisms, most findings deal with bacteria and are of uncertain relevance to higher animals; but there are welcome contributions dealing with the latter, by J. B. Walker on creatine synthesis and by J. N. Davidson on DNA synthesis. Control mechanisms figure prominently in the *pièce de résistance*—Van R. Potter's lecture on enzymes and the deletion hypothesis as now presented in a revised form. In discussing the problem of choice of experimental tissue, Potter makes a salutary distinction between the problem of carcinogenesis and the problem of chemotherapy: "It is folly for us to think that we can learn the fundamental nature of cancer or of carcinogenesis by studying tumors that represent far advanced stages of cancer evolution . . ."

Both volumes, then, warrant a qualified recommendation. If future Symposia are to be equally wide in the field covered, participants should be encouraged to make review-type contributions rather than detailed presentations of their own experimental results. Moreover, any measures to reduce the cost (e.g. soft covers) and the publication time-lag would be welcome.

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