there are eight papers on melanomas, two on carcinomas, and one on *acanthosis nigricans,* compared with five on biochemistry of pigment, two on embryology, two on genetics, and one on the relation of endocrine glands to pigmentation in the fowl. The invertebrate animals are not treated.

As is usual in publications of this kind, the papers vary in length and quality. The longest, as well as the most comprehensive, paper is that on the structure of melanins by H. S. Mason, a valuable review of the chemistry of melanin formation. The book is well printed on glossy paper and extensively illustrated with graphs and photographs. The reproduction of the halftones is first rate.

One gratifying outcome of the conference was an agreement on the terminology to be used for pigment cells. The definitions adopted for melanoblast, melanocyte, macrophage, and melanophore were also approved by the Subcommittee on Oncology, Division of Medical Sciences of the National Research Council and, hence, may be expected to have a more uniform use in the future.

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Explaining the Atom. Selig Hecht. Rev. by Eugene Rabinowitch. Viking, New York, 1954. xviii + 237 pp. Illus. $3.75.

It is a well-known fact that the distinguished scientist, when writing a popular book on his special field, underrates the difficulty of the ideas he is familiar with and so produces a book for his colleagues but not for the general public. The outstanding popular book on the atomic bomb has been written not by a nuclear physicist but by a great expert in another field of science. In 1946 Selig Hecht, professor of biophysics, wrote *Explaining the Atom,* the book that gave to many thousands an understanding of atomic structure and nuclear energy. The author's incentive was as much scientific interest as a sense of responsibility of the citizen who sees a new world coming and wants to propagate an understanding of the driving forces.

After the untimely death of the author, Eugene Rabinowitch brought the book up-to-date by many minor changes. The vivid style of Selig Hecht, who told the story of discoveries rather than described detail, is fully preserved. Hecht's book ends with the sections "The atomic bomb is built," and "The secret is out."

Rabinowitch, known to the public as editor of and contributor to the *Bulletin of the Atomic Scientists,* continues the story to the level of 1954. He describes the later development of the fission bomb and, more fascinating, the new "superbomb." Here he discusses Bethe's carbon cycle and the fusion reactions between hydrogen isotopes and lithium leading to thermonuclear reactions. They allow the construction of the famous bomb whose size is not subject to limitations (except the carrying capacity of a plane) and whose price is presumably much lower than that of a large fission bomb. A separate chapter is devoted to "Atomic power."

The chapters contributed by Rabinowitch emphasize the idea of Selig Hecht: to inform the citizen of the indispensable background of physics as well as to point out the relation of nuclear energy to the industrial development and domestic and foreign policy. The scope of fission is evident from the recent estimate that "the world resources of commercially utilizable fissionable material are fifty times greater than the world resources of commercially utilizable fossil fuels." This estimate, however, seems to include all uranium and thorium irrespective of the efficiency of the breeding process which leads to the fissionable isotopes.

Rabinowitch closes with an optimistic prospect:

> We live on the continuous but finite surface of a sphere of which any part can be reached from any other part in a few hours. It is obsolete to suppose that such a surface can be artificially maintained in a fractional state of national groups . . . the sooner all peoples join in some law-abiding extranational order, the better for us who hope for civilization.

The second edition of Selig Hecht's book is as excellent as the first edition for the instruction of the citizen who wants a sound foundation for his judgment on domestic and international policies as affected by the new energy.

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Linear Transient Analysis. vol. I, *Lumped-Parameter Two-Terminal Networks.* Ernst Weber. Wiley, New York; Chapman & Hall, London, 1954. xiv + 348 pp. Illus. $7.50.

Linear Transient Analysis is a textbook containing material appropriate for a basic graduate course in transient analysis. It is also of value to practicing engineers who will find four methods of solving linear transient problems gathered together in one volume. The book is unique in this respect. In presenting the classical solution of network response, the Heaviside-Jeffreys' operational calculus, the Laplace transformations, and the Fourier transform, Weber has laid bare the mystery of transients. To those devotees of the Laplace transform who would shun the classical or Heaviside methods, he answers:

> Fundamental knowledge, real understanding of any subject matter, must be independent of the form in which it is presented or in which we had our first introduction to it. The greater the variety of possible expressions for the same basic relationship, the clearer will be the concept recreated in the mind of the searching individual.

The chapters are laid out in a well-integrated order. The first chapter deals with concepts of circuits and networks that might ordinarily be overlooked in undergraduate work but are the essence of advanced circuit analysis. Classical solutions of network re-

sponse follow in the second chapter where solutions of first- or second-order systems are presented for a number of source functions. The third chapter is a 27-page digression into the fascinating area of analogues and duals. Lagrange's equations of motion and electromechanical systems are treated briefly in this chapter. Following the chapter on Heaviside-Jeffreys' operational calculus, there is a treatment of the Laplace transform method. Here Weber relies rather heavily on physical justification for mathematical operations, but he is careful to point this out. The indicial response function is given importance as the key to the solution of linear transient problems involving arbitrary driving functions. The last chapter is concerned with the spectrum concept and takes up Fourier series and Fourier integrals. The treatment of what might be called nonideal periodic wave forms is a unique feature of this chapter.

There is a generous appendix of six parts: "Notation, symbols, and glossary"; "Electromagnetic fields and energy relations"; "Determining roots of polynomials"; "Matrices and determinants"; "Functions of a complex variable"; and "General bibliography." The bibliography is excellent and the footnoting of the volume is unusually liberal. Weber's prose reads well and appears to be quite adequate for its purpose.

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Connective Tissues. Trans. of the Fourth Conference, Feb. 18–20, 1953. Charles Ragan, Ed. Josiah Macy, Jr., Fdn., New York, 1953. 197 pp. Illus. $3.75.

The informal conversational style of these conferences is again followed in this meeting. The chapter titles indicate in only a very general way the content. They are "General areas of agreement reached in this conference group"; "Isolation and characterization of mammalian striated myofibrils"; "The effect of vitamin A on organ cultures of skeletal and other tissues," and "Outline of problems to be solved in the study of connective tissues."

The first chapter is extremely interesting in that it brings out the almost abysmal problem of word meaning and the difficulties in communication that necessarily follow. The discussants formulated an outline related to connective tissues, but they had only "relative unanimity" and not real agreement on the concepts involved. In my opinion a statement by one of the discussants very nearly summarizes this chapter:

> I think we are quibbling. We are reaching the point where we are merely using words and I think none of us knows what he is talking about.

The next two chapters are concerned with some extremely interesting observations on myofibrils and the effect of vitamin A on certain tissues. The pertinence of these subjects toward increasing our understanding of the scope and function of connective tissues seems rather remote.

The last chapter is devoted to a discussion of the problems of the structure and function of connective tissue. Reference is made to the difficulties encountered in trying to correlate the observations of the histochemist and biochemist on the localization and content of connective tissue substances. One of the most interesting problems advanced was that of whether the parenchymatous structures depend on the surrounding connective tissue stroma for their functional capacity. This concept was discussed by Gersh and Catchpole in 1949 and has since been beautifully elaborated upon by them and others.

This little volume is interesting but is not a valuable addition to this field.

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Grundlagen und Praxis chemischer Tumorbehandlung. Zweites Freiburger Symposion an der Medizinischen Universitäts-Klinik. J. Pirwitz. Springer, Berlin, 1954. 289 pp. Illus. Paper, DM. 45.

Cancerization of cells is an irreversible process consisting of damages that gradually involve a great many self-duplicating cytoplasmatic particles of macromolecular structure (Druckrey) and result in preinvasive intraepithelial carcinomas of ½- to 20-yr duration (Schubert). Cancer is not a problem of heredity (K. H. Bauer). Cancer in adults might be the response to agents that acted in childhood. [It is apparently unknown in Germany that this was already recognized and proved in 1939 (S. Peller, *Cancer in Man,* International Univs. Press, New York, 1952, pp. 307–310)].

Most anticancer agents are cytostatica. They attack growing cells during the late interphase, when deoxyribonucleic acid is being duplicated (Marquardt). True mitotic poisons are rare. Within the limits in which rapidly multiplying normal tissues are not severely damaged, the available agents do not kill cancer cells but weaken them enough to give the broken-down defense mechanism a chance (Lettré, Domagk). Mutations of the treated cancer cells cause the diminishing effectiveness of therapy (Burchenal). Since the chemical deviations of the cancer cell from the normal cell are too small, development of cancer-cell-specific poisons is unlikely. Cytostatica have much in common with x-rays (radiomimetica, Boyland). Surgeons should utilize chemotherapy against cells disseminated during operation, and so forth (Kraus). So far no human cancer was cured by chemotherapy (Heilmeyer, Pirwitz). Cures of prostatic cancer might be achieved by modification of chemotherapy—by intravenous administration of large amounts of inactive stilbestrol diphosphate that is split and activated in all prostatic cancer cells (Raabe, Rockstroh, Brock).

This symposium created an opportunity for an inspiring and fruitful exchange of ideas on matters essential to every cancer investigator.

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