Book Reviews

Cell Chemistry. A collection of papers dedicated to Otto Warburg on the occasion of his 70th birthday. Dean Burk, Ed. Elsevier, Houston–Amsterdam, 1953. 362 pp. Illus. $7.50.

The original edition of this book appeared as an issue of *Biochimica et Biophysica Acta* (vol. 12, No. 1/2, 1953). It contains 35 original papers by recognized leaders in the field of biochemistry, including two papers in which Warburg himself is an author, thereby attesting to his continued vigor and productivity. This volume, covering a diversity of subjects, provides an illuminating cross section of the best in current biochemical thought. Although there was obviously some attempt on the part of the editor to select authors whose work has developed from fundamental observations made by Warburg during the past 50 years, this has in fact imposed no limitation on the selection process, since there is probably no worker in biochemistry today who has not profited in some way from one or more of Warburg's contributions. A chronological listing of the experimental contributions that are regarded by Warburg as his most important discoveries is provided by the editor in an unusual introduction, which includes some interesting comments on Warburg's personal, scientific, and political history.

The high caliber of the present volume is best indicated by the following impressive list of the principal authors: L. F. Leloir, H. Tamiya, J. H. Northrop, P. Karrer, F. F. Nord, C. B. van Niel, E. Boyland, V. Du Vigneaud, R Wurmser, B. L. Horecker, J. H. Quastel, O. Meyerhof (deceased), A. Szent-Györgyi, C. Martius, F. Lipmann, H. H. Weber, A. L. Schade, H. A. Krebs, A. I. Virtanen, A. L. Lehninger, G. D. Greville, H. O. L. Fischer, H. G. Wood, A. Kornberg, G. T. Cori, E. S. G. Barron, H. M. Kalckar, C. Neuberg, H. Theorell, C. Fromageot, B. Chance, F. Lynen, S. Ochoa, D. Nachmansohn, R. Kuhn, D. Burk, and O. Warburg.

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Signal, Noise and Resolution in Nuclear Counter Amplifiers. A. B. Gillespie. McGraw-Hill, New York; Pergamon Press, London, 1953. 155 pp. Illus. $4.50.

This short monograph presents an orderly and readily understood analysis of signal, noise, and resolution in equipment for electrically detecting, amplifying, and counting nuclear particles. The principal problem treated concerns pulses from a gas ionization chamber. Such pulses require considerable amplification and become mixed with noise arising from grid current and shot effect in the input stage. The author restricts his detailed treatment to an amplifier whose pass band is set by single RC time constants at low and high frequencies. Although the high-frequency cutoff of practical amplifiers is usually more rapid than that arising from a single RC element, favoring a higher signal-to-noise ratio, the essential factors involved are all carefully treated in the analysis and, in many cases, subjected to experimental verification.

The derivation of mathematical results is contained in an appendix where it does not obscure the main line of reasoning. At one point, the author admits that one of his mathematical findings disagrees with what one might expect on an intuitive basis, and a careful examination shows that his analysis is in error. Fortunately, he discards this result in favor of one that is essentially correct and from which he derives useful results that appear to agree with experiment. Except for this slight lapse in mathematical analysis, no other errors have been detected.

The monograph leaves no doubt in the mind of the reader that the author is very familiar with his subject. The ideas presented in the monograph should be understood by every experimentalist who uses electronic techniques for making nuclear measurements.

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A Bibliography of the Research in Tissue Culture: 1884 to 1950, Vols. I and II. An index to the literature of the living cell *in vitro*. Margaret R. Murray and Gertrude Kopech. Academic Press, New York, 1953. 1741 pp. $24 per set.

Workers in a particular field of investigation often drift along complacently for years preoccupied with immediate current tasks, only to awake abruptly to the realization that some single phase of activity has been so long neglected that a really herculean effort is needed to bring things back into balance.

The tissue-culture field has recently been pulling itself out of just such a shock. In Nov. 1946, at the invitation of the Committee on Growth of the National Research Council, a group of tissue culturists and others met at Hershey, Pa., to discuss mutual problems. When this group came to summarize its discussions, several tasks were recognized as urgently requiring attention. The Tissue Culture Commission was organized to implement this need. This commission later became the present Tissue Culture Association.

The tasks that the commission (association) set for itself were four: (i) To establish and maintain a training course for workers in tissue culture, until such time as some university would take over this work. This course was conducted for one summer at Toronto and then transferred to Cooperstown, N. Y., where it has become the well-known Cooperstown Course in Tissue Culture Techniques. (ii) To provide a source of tissue-culture nutrients and supplies available to all laboratories so as to free individual workers from the time-consuming and often complex problems

of supplying them individually. Microbiological Associates and Difco Laboratories have ably taken over this problem. (iii) To set up a testing laboratory that would establish standards of uniformity for all nutrient ingredients and certify the acceptability of commercial products. This project has met with many vicissitudes and has never been fully and satisfactorily consummated. (iv) To prepare a working bibliography of the entire field of tissue culture. This last task was assigned to Margaret R. Murray. The two volumes under review are the result of this assignment.

In setting up this project, the commission (association) recognized that the field was a broad and diverse one which had long been neglected in the usual review journals. But it did not quite realize the extent of this neglect. Not a single review of the subject in English had appeared since 1928. The *Annual Review of Physiology, Annual Review of Biochemistry,* and similar publications were blank on this point. So were *Biological Reviews, Physiological Reviews,* the *Quarterly Review of Biology,* and others, except for Bloom's rather limited and specialized paper (1939). The latest compendium was Fischer's *Gewebezüchtung,* which appeared in its last edition in 1930. This included a bibliography of about 3000 titles. It was hopefully estimated that perhaps 4000 new ones might be found. How wrong this figure was! Before the task was completed 29,000 articles in 27 languages were read and indexed. Endless time was spent in weeding out some 5500 "ghost" references—references that exist in the literature but in such defective form that the reviewers could not even identify any valid article to which they could be referred! Not only did the task grow but the concept of what was needed likewise grew. Dr. Murray enlisted the technical help of Gertrude Kopech, a young woman with sound bibliographic training, a record of experience in commercial bibliographic work which gave her a clear idea of what the working scientist needs, an unusual flair for languages which included command of a wide range of Slavic tongues as well as the Latin and Germanic ones, and a degree of dedicated thoroughness not often to be had.

The result after nearly 7 years of labor is a bibliography covering 66 years of the literature of a sprawling inchoate but highly important field, fully cross-referenced, and unusually usable.

It has its faults, of course. No work of 2000 pages of small type could possibly be free of them. The thoroughness of cross-indexing and the useful, but sometimes unnecessary, custom of citing every reference in full under each heading has sometimes resulted in the same title appearing two or three times on a single page. The user may appreciate this, but it does add to costs. There are lacunae. This reviewer failed to find any references to the effects of Pyrex or Jena versus soft glass on growth of cultures, which is certainly a surprising gap in the literature if it is a real one. Too close adherence to the *Union List of Periodicals* has resulted in a rather disconcerting mode of citation of what most of us know as the *Journal of the National Cancer Institute.* There are other lapses. But on the whole it is an extraordinary job for which the authors are to be congratulated.

It is fortunate that this task *has* been merely catching up on 25 years of neglect and will not have to be repeated in a year or so! It is to be hoped that 5- or 10-year supplements will make the job much lighter in the future.

These two volumes will be a "must" in every research biology library and on the desk of every investigator interested in the aseptic cultivation of plant and animal cells. We can only say, "Thank you, Dr. Murray and Miss Kopech, for a colossal and important job, well done!"

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Manuel de Paléontologie Animale. Léon Moret. Masson, Paris, ed. 3, 1953. 759 pp. Illus. Paper, 2880 fr.

In this third edition of a standard French paleontology textbook, a 12-page addendum, consisting for the most part of a list of significant publications, has been added. They are listed according to the pertinent chapters, together with some commentaries. Otherwise, the text is that of the 2nd edition of 1946.

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Electrostatique et Magnétostatique. Emile Durand. Masson, Paris, 1953, xii + 774 pp. Illus. Paper, 5760 fr., cloth, 6335 fr.

A theoretical book on this subject usually concentrates one one of the following topics: (i) general theory, based on Coulomb's and Ampère's laws; (ii) formal problem-solving techniques; (iii) properties of matter. This book presents all three topics in detail, at an advanced level—a stupendous undertaking but remarkably successful.

The second topic shows firsthand experience. Durand expertly presents a huge amount of useful material. He spends little time reviewing the elementary properties of complex variables or spherical harmonics, but he works out many problems in full. Conformal transformations and numerical methods get considerable attention.

For the third topic, the author seems to have compiled material mostly from secondary sources. He discusses all electromagnetically conditioned properties except those that are primarily quantum-mechanical or dynamic. His organization is skillful; and where he had a number of treatises and review articles to draw from, as in ferromagnetism, his selection is judicious. In dielectrics, books and reviews are scarce, and here his discussion is less balanced; he omits recent (1936–) statistical-mechanical calculations.

The handling of the first topic is faulty at a few points. On pages 62–63, the author forgets that the