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

field intensity, defined directly from Coulomb's law, converges only conditionally at points of the dipole distribution; he thus implies that some formulas express theorems when in fact they express arbitrary conventions. He follows tradition by localizing the energy; the method leads to no wrong results, but it encourages wrong interpretations of the results. Confusion about these things has loaded the literature with futile controversy. These are regrettable defects in an otherwise masterly presentation, which shows much originality.

Durand uses Giorgi meter-kilogram-second units; he has even translated all his magnetization curves from the original electromagnetic.

There are few specific references; data and figures are often quoted with no, or only vague, mention of the sources But if the reader wishes to follow up particular topics, he can ultimately find what he needs by consulting the general references that are listed at the ends of the chapters.

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The Furans. A.C.S. Monograph Series. A. P. Dunlop and F. N. Peters. Reinhold, New York, 1953. xix + 867 pp. Illus. + plates. $18.

It may be said that furan chemistry has had its ups and downs. Older than benzenoid chemistry, the advancement of knowledge in furan chemistry declined gradually as coaltar chemistry gained importance; then it was revived about 1925 when the industrial production of furfural provided raw material and incentive for renewed investigation. The cycle of interest is understandable to furan chemists, some of whom say jocularly that "a 40-percent yield from furans is equivalent to 100 percent in benzene chemistry." Behind this platitude is the fact that the manipulative art is paramount in furan chemistry. In these circumstances a comprehensive monograph such as the one under review becomes a necessity. It is fitting that it should have been compiled by representatives of the company that pioneered in production of furfural.

In addition to a preface by the authors, in which they wisely exclude lactones and anhydrides comprising 5-membered oxygen heterocycles, there is a short foreword by Brownlee and Miner who early realized the value of a naturally-generated chemical raw material, furfural, and who pioneered in its production. There is also a general introduction by the editors of the A.C.S. monograph series in which the curious and somewhat questionable statement is made that, "most workers in the sciences were coming to see the artificiality of the separation (between so-called 'pure science' publications and technologic or applied science literature)." Fortunately, Dunlop and Peters have realized the distinction, and the monograph is divided into Part I (707 pages, The Chemistry of the Furans), and Part II (76 pages, Industrial Applications of Furfural and its Derivatives).

The first 14 chapters of Part I cover the functional group derivatives of furan. The last two chapters of this part involve the important reactions of furan ring cleavage and catalytic hydrogenation. These chapters are excellently written with complete literature reference, adequate graphic formulation, and convenient tabulation. I regret that a short chapter describing furan syntheses from noncyclic substances was not included. Undoubtedly such an effort would have included the important syntheses of Morel and Verkade [*Rec. trav. chim.* 67, 539 (1948)], as well as alkyl furans, which are not mentioned.

Part II includes three chapters describing furfural as a chemical intermediate, as a solvent and, together with furfuryl alcohol, as a resin component. Since the authors state in their preface that only well-recognized industrial processes are included, Part II must necessarily be incomplete. An appendix summarizes the furan resin patents.

The typography is good and free from errors. Unfortunately, there is no author index, and the classification in the subject index is not uniform; but these deficiencies are minor. The monograph is highly recommended.

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New Books

Proceedings of a Conference on the Utilization of Scientific and Professional Manpower. Held Oct. 7–11, 1953, Columbia University. National Manpower Council, Columbia Univ. Press, New York, 1954. xii + 197 pp. $3.50.

Elementary Fluid Mechanics. ed. 3. John K. Vennard. Wiley, New York; Chapman & Hall, London, 1954. xii + 401 pp. Illus. $5.50.

Living Crafts. G. Bernard Hughes. Philosophical Library, New York, 1954. 192 pp. Illus. + plates. $4.75.

Plant Breeding for Everyone. John Y. Beaty. Charles T. Branford, Boston, 1954. 102 pp. Illus. + plates. $2.75.

Problems of Consciousness. Trans. of the Fourth Conference, Mar. 29–31, 1953. Harold A. Abramson, Ed. Josiah Macy, Jr. Fdn., New York, 1954. 177 pp. Illus. $3.25.

Plague. R. Pollitzer. World Health Organization, Geneva, 1954. (U. S. distr.: Columbia Univ. Press, New York.) 698 pp. Illus. + plates. $10.

A Thousand Geese. Peter Scott and James Fisher. Houghton Mifflin, Boston, 1954. 240 pp. Illus. + plates. $4.

Matter Energy Mechanics. Jakob Mandelker. Philosophical Library, New York, 1954. ix + 73 pp. Illus. $3.75.

Applied Electronics. ed. 2. Truman S. Gray. Technology Press, Cambridge, Mass.; Wiley, New York; Chapman & Hall, London, 1954. xxviii + 881 pp. Illus. $9.

Polymer Degradation Mechanisms. Proc. of NBS symposium, Sept. 24–26, 1951. National Bureau of Standards, Washington, 1953. (Order from Supt. of Documents, GPO, Washington, D.C.) iv + 280 pp. Illus. $2.25.

Instrumental Analysis. John H. Harley and Stephen E. Wiberley. Wiley, New York; Chapman & Hall, London, 1954. vii + 440 pp. Illus. $6.50.

The Collected Papers of Peter J. W. Debye. Interscience, New York–London, 1954. xxi + 700 pp. Illus. $9.50.