for the initiator cell hypothesis—are not mentioned at all. Wilson and Ross' photomicrographic data, which suggest the possibility of meiosis, are mentioned briefly but are not pictured, and the chromosomal figures are not evaluated. Instead, on pages 39 and 40 Bonner belabors a very dead horse—the original scheme of sexuality that was proposed by Wilson and that died in 1957 by its creator's hand. As one of the pallbearers, I submit that the modified scheme of Wilson and Ross, summarily dismissed on page 41, deserves far more serious consideration than it is granted. Finally, Gregg's stimulating work on the appearance of surface antigens during morphogenesis is covered in a single short paragraph, on page 112, without inclusion of specific data.

In view of the paucity of detailed, quantitative information and the rather superficial treatment of underlying genetic and biochemical problems, this book does not seem to me to be an improvement upon the several reviews of the biology of the cellular slime molds that are now available.

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Exploration Hydrobiologique des Lacs Kivu, Édouard et Albert (1952–1954). Scientific results. vol. 3, fascicule 3. Institut Royal des Sciences Naturelles de Belgique, Brussels, 1959. 196 pp. Illus.

Among the most important of the reports on the fauna and flora of tropical areas published in recent years have been the several extensive series of volumes issued by the Institute of the National Parks of the Belgian Congo. Somewhat in the nature of a companion series are those issued by the Royal Institute of Natural Sciences of Belgium on the natural history of African areas which have been the subject of special Belgian explorations. The current reports on lakes Kivu, Edward, and Albert follow and are comparable to several volumes dealing with the 1946–1947 hydrobiological exploration of Lake Tanganyika.

The present fascicule contains six reports. The first of these, by Jean Verbeke of Brussels, deals with the stomach and intestinal contents of the fish of lakes Edward and Albert. In the brief introduction the relatively impoverished fish fauna of Lake Edward, consisting of 27 species, is compared to the fish fauna of Lake Albert, which includes 41 recorded species. There follow extensive lists and tables of the fish and of their food resources, based on many captures—of 17 and 23 species, respectively—from the two lakes. Details of place, time, condition, method of capture, and so on for each fish examined are well documented and are presented together with an enumeration of the stomach and intestinal contents identified. An ultimate practical objective of reports such as this is evidently the acquisition of sufficient information to make possible the improvement of the fish resources of these lakes, perhaps partly through the introduction of species which do not now occur.

The second paper, on Cladocera (water fleas), is by Vincent Brehm of Lunz am See, who has had over 45 years of experience with the group. It deals with the Cladocera of the three lakes, mainly those taken in and about the lakes but also those removed from fish. The discussion and tabulation concern 24 species, none of which is described as new, though the anatomy and specific characters of several are described and illustrated.

In the third paper, W. D. Hincks, of Manchester, reports briefly on 200 specimens of Dermaptera (earwings), representing 10 species. Except for two poorly known species of *Spongovostox,* those recorded are rather common, widely distributed species.

A rather full report on the Trichoptera (caddis flies) of Lake Albert, by Serge Jacquemart of Brussels, comprises the fourth paper. A total of 25 species are treated, the majority being illustrated; of the 25, three are described as new. About half of the species were not encountered at lakes Kivu and Edward, according to a report by Jacquemart in fascicule 2.

Larvae of Chironomidae (midges) of the three lakes are dealt with in detail by Anna Chrispeels of Edinburgh. Twenty-six species are treated, and all of them are illustrated, but specific names could not be applied with certainty to any of them. Generic or species-group placement must suffice until rearing of the larvae and association of the individuals with identified adults have been accomplished. The Chironomidae are one of the principal foods of the lake fishes, and this situation demonstrates the exacting and time-consuming biological and taxonomic work required for a full understanding of the insects comprising much of the diet of these important animals. The illustrations consist of fine, detailed line drawings, mainly of head structures and terminal portions of the abdomen. Descriptions, identification keys, documentation of collecting stations and material removed from fish, and a bibliography are included. Adult Chironomidae were discussed by P. Freeman in fascicule 2.

The sixth and final paper is a brief account of the Bostrychidae (false powder-post beetles) by J.-M. Vrydagh of Brussels. Sixteen species, in nine genera, of this family were collected near the three lakes. The author expresses the opinion that, while adults sometimes are attracted to light at night, it is a mistake to consider this a general habit.

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Elements of Physical Metallurgy. Albert G. Guy. Addison-Wesley, Reading, Mass., ed. 2, 1959. xvi + 528 pp. Illus. $9.50.

Elements of Physical Metallurgy is a well-organized, well-written book on physical metallurgy. The author has fulfilled his objective of writing a book which can be used as a textbook for science, engineering, and metallurgy students. It should also prove a useful addition to the library of the practicing metallurgist, since it presents the fundamentals of physical metallurgy in a very readable manner and (in this second edition) covers the latest concepts of dislocation theory.

In the first two chapters, the field of metallurgy is defined and surveyed. In the next four chapters atomic theory, crystal structure, phases in metal systems, and phase diagrams are covered. In the latter chapters some industrially important equilibrium diagrams are discussed. With these chapters as a background, the author then discusses the physical properties, elasticity, plasticity, and corrosion (air, water, and liquid metal) of metals.

The last four chapters are concerned with reactions in metals: diffusion in metals; recovery, recrystallization, and grain growth; age hardening; and heat treatment of steels. The book is well illustrated, and each chapter concludes with a list of references as well as a number of problems. Throughout the book, the author shows how the basic principles are applied in industry.

This book covers a great deal of material and should make an excellent text

for a course in physical metallurgy. A few errors appear in the text. On page 45, in the illustrative problem, E equals 3.97×10^{-12}, not 3.97×10^{-22}; on page 66 it is stated that thorium is a nuclear fuel (it is actually a fertile material which can be converted by neutron absorption into a fuel); on page 77, in Fig. 4a, the Cs ion appears in the sodium chloride structure; and on page 184 the ends of the tie line at the base of Fig. 6–13 extend beyond the phases in equilibrium. Finally, the section on metals in nuclear engineering seems out of place at the end of chapter 3. In future editions this section should be amplified.

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A History of Western Technology. Friedrich Klemm. Translated by Dorothea Waley Singer. Scribner's, New York, 1959. 401 pp. Illus. + plates. $6.50.

This is a translation of a work originally published in Germany in 1954, in the series *Orbis Academicus, Histories of Scientific Problems in Documents and Descriptions.* The body of the book consists of selections from the sources, connected by the author's commentary. Such an approach to the history of technology seems never to have been tried before, and the author shows it to be surprisingly rewarding in this field, which is generally thought to be wanting in written records.

The author, who is librarian of the famous Deutsches Museum, shows himself to be steeped in the little-known literature of early technology. Not only has he quoted from such authors as the Italians Alberti, Martini, Filarete, and Fontana, and the Germans Glauber, Boeckler, Leupold, and Calvoer, but he has woven the quotations into what is surely the most readable history of technology yet published. If the German writers are favored, they are less favored here than they are neglected in most works on this subject.

As is usual in one-volume histories of technology (of which there are very few), the earlier periods are treated in a leisurely fashion, and later periods with increasing brevity, and the 20th century with a bare snapshot. Klemm's exposition of the Middle Ages and of the era that followed, through the 17th century, is outstanding, and as this is the darkest age of technology, this section gives his book its greatest distinction. Some of the source materials quoted are as thought-provoking as they are unusual. Examples are the Council Decrees of 16th-century Nürnberg in the matter of the inventive "red metal turner" Hans Spaichl, and the quoted impressions of European visitors to the Philadelphia Fair of 1876.

The translation is generally satisfactory, and it is gratifying to have this outstanding book rendered so promptly into English. It is very much to be regretted, however, that the publisher of the English edition saw fit to omit so much of the priceless accessory documentation contained in the German edition. The footnotes referring to sources and secondary works have been retained, but the bibliography has been reduced from ten pages to four (the reduction is actually greater than this would indicate, for the pages of the German editions are closely packed), through the elimination of all but English works. Omitted entirely from the English edition are a 6-page chronology of events in the history of technology and a 17-page bibliography of sources. Anyone seriously interested in further reading in the subject must, therefore, have recourse to the original.

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New Books

Analytical and Canonical Formalism in Physics. André Mercier. North-Holland, Amsterdam; Interscience, New York, 1959. 229 pp. $6.75.

The Chemistry of Organic Compounds. A year's course in organic chemistry. James Bryant Conant and Albert Harold Blatt. Macmillan, New York, ed. 5, 1959. 660 pp. $7.75.

Ground Water Hydrology. David Keith Todd. Wiley, New York; Chapman & Hall, London, 1959. 348 pp. $10.75.

The Hand of Life. The story of the Weizmann Institute. Ritchie Calder. Weidenfeld and Nicolson, London, 1959. 78 pp. 30s.

Handbuch der Physik. vol. 41, pt. 1, *Nuclear Reactions 2: Theory,* 587 pp., DM. 145; vol. 44, *Nuclear Instrumentation* 1, 480 pp., DM. 125; vol. 53, *Astrophysics 4: Stellar Systems,* 573 pp., DM. 142. S. Flügge, Ed. Springer, Berlin, 1959.

High Temperature Materials. R. F. Hehemann and G. Mervin Ault, Eds. Wiley, New York; Chapman & Hall, London, 1959. 560 pp. $17.50. The papers in this volume are the results of the symposium on recent developments in high temperature materials that was held 16–17 April 1957 in Cleveland, Ohio. The symposium was sponsored by the Metallurgical Society and the American Institute of Mining, Metallurgical, and Petroleum Engineers. Thirty-four papers by 51 contributors are presented under the following general sections: "Cobalt- and nickel-base alloys," "Cermets and intermetallics," "Refractory metals," "Strengthening by dispersion of insoluble particles," "Vacuum melting and its effects on properties," "Effect of testing environment on properties," "Oxidation resistance."

Methods of Vegetation Study. Edwin Allen Phillips. Holt, New York, 1959. 107 pp. $2.95.

Microbiology, Yesterday and Today. Vernon Bryson, Ed. Inst. of Microbiology, Rutgers Univ., New Brunswick, N.J., 1959. 127 pp. $4. This volume consists of the proceedings of a symposium held at the institute on 5 June 1958 in honor of the 70th birthday of Selman A. Waksman. The contents of the volume are: "Microbial biochemistry and its development" (J. H. Quastel); "Antibiotics—a new field for microbiological research and perspectives for the future" (H. B. Woodruff); "Episodes in immunochemistry" (M. Heidelberger); "Bacterial classification—problems and developments" (S. T. Cowan); "Some contributions of genetics to microbiology" (V. Bryson); "Aspects of Russian microbiology" (G. K. Skriabin); "Microbiology yesterday and today" (S. A. Waksman).

National Tuberculosis Association, 1904–1955. Virginia Cameron and Esmond R. Long. National Tuberculosis Assoc., New York, 1959. 335 pp. $5.

Principles and Practice of Gas Chromatography. Robert L. Pecsok, Ed. Wiley, New York; Chapman & Hall, London, 1959. 238 pp. $6.75. This book is the result of a course in gas chromatography offered by the University of California in February 1959. The 13 chapters are based on lectures by C. M. Drew, S. A. Greene, H. S. Knight, and H. W. Patton.

Push and Pull. The story of energy. Paul Blackwood. McGraw-Hill, New York, 1959. 190 pp. $3 (juvenile book).

Recent Advances in the Chemistry of Cellulose and Starch. J. Honeyman, Ed. Interscience, New York, 1959. 366 pp. $9.25.

Subcellular Particles. A symposium. Teru Hayashi, Ed. Ronald, New York, 1959. 221 pp. $6.

Survey Adjustment and Least Squares. Hume F. Rainsford. Ungar, New York, 1958. 334 pp. $9.50.

Traité de Chimie Biologique. vol. 2, pt. 1, *Substances minérales—glucides;* pt. 2, *Vitamines, lipides, stérides, caroténoides, fermentations, photosynthèse.* Louis Genevois. Presses Universitaires de France, Paris, 1959. 880 pp. Paper, F. 2200.

Ultracentrifugation in Biochemistry. Howard K. Schachman. Academic Press, New York, 1959. 284 pp. $8.80.

The Viruses. Biochemical, biological, and biophysical properties. vol. 3, *Animal Viruses.* F. M. Burnet and W. M. Stanley, Eds. Academic Press, New York, 1959. 445 pp. $12.