lels in the history of science." It describes Brunswick's own work on the development of criticism in children and J. Piaget's parallels between theorizing in children and in the early history of physics. The stages of egocentrism, functionalism, and overgeneralization are recognizable in some of the stories of historical events which follow: Robert H. Lowie speaks of ethnocentrism as a stage in the development of ethnography; J. B. Stallo's critique of classical physics, explained here by Stillman Drake, can be understood as a fight against overgeneralization; and Newton's *Hypotheses Non Fingo*, to which E. W. Strong here devotes a penetrating study, could be linked to the search for the *genus proximum*, according to Egon Brunswick.

E. O. Essig gives a sympathetic picture of an almost unknown hero of science, Charles Fuller Baker, whose insect collection of about a quarter of a million specimens was saved by the Smithsonian Institution.

In the "Essays in biology," the *Festschrift* honoring Evans on his 60th birthday (1942), Frederick O. Koenig dealt with Sadi Carnot's thermodynamic theorems; he extends this study here to a detailed history of the second law of thermodynamics. Victor F. Lenzen presents a somewhat dry account of Max Planck's philosophy of science. Leonardo Olschki shows the wide influence that radiated from Marco Polo's description of the world. The last essay, on the first determination of stellar parallax, recreates the dramatic events of 1837–39 and the part played by Wilhelm Struve; the author is his great-grandson, Otto Struve.

This is a book for those adventurous spirits who love to make excursions beyond their fields of specialization.

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Plant Pathology. An advanced treatise. vol. 2, *The Pathogen*. J. G. Horsfall and A. E. Dimond, Eds. Academic Press, New York, 1960. xiv + 715 pp. Illus. $22.

In the second volume of their trilogy on plant pathology, the editors and their collaborating authors maintain the high standards established in volume 1. The theme of the present volume is the pathogen, in contrast to that of the earlier volume, which was centered around the diseased plant. In an interesting introductory paragraph, careful, even forceful, distinction is drawn between parasites and pathogens and, necessarily, between the resulting phenomena of parasitism and pathogenism. Many readers will be surprised to learn that these terms are not synonymous. The authors also emphasize that, in their opinion, diseases are *caused*, not *incited*, although the latter term has become increasingly popular in recent years. Pathogens are of many kinds, including not only the fungi and bacteria (which are usually thought of) but such diverse agents as nematodes, mites, insects, viruses, and many inanimate entities (for example, chemical deficiencies or excesses, and even various phases of unfavorable weather).

In the single chapter devoted to parasitism, George L. McNew thoroughly reviews the subject, presenting his material under such topics as the nature, origin, evolution, and physiology of parasitism. His discussion of the law of host-parasite balance in pathogens is particularly effective. In contrast, the remaining 13 chapters, each written by a highly qualified specialist, are devoted to pathogenicity or the ability of the parasite to produce disease. Three general phases of the subject, reproduction of the pathogen, the nature of pathogenicity, and the mechanisms of inhibiting the pathogen, are considered.

F. C. Bawden reviews the multiplication of viruses, broadening his presentation by including such topics as the differences between viruses and organisms, and analogies with bacteriophages. Lilian Hawker discusses the reproduction of bacteria, actinomycetes, and fungi. The insects and arachnids are left to the entomologists. Spore germination and the various factors affecting the phenomenon are discussed by V. W. Cochrane.

The broad field of the nature of pathogenicity or the ability of the organism to cause disease is presented in six chapters. Major topics considered are the mechanical and chemical ability to break host barriers; interactions of pathogen, soil, soil microorganisms, and host; the genetics of pathogens; and toxins. The problem of finding mechanisms to inhibit pathogens is met by a careful review of the current knowledge of virus inactivation and of the physiology and chemistry of fungicides.

The nematodes come into their own with the concluding chapter which, although headed nematocides, covers a broader field and is, in effect, a brief but thorough account of plant diseases caused by nematodes.

As in the previous volume the indexes are extensive and adequate.

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Infectious Diseases of Animals. vol. 1 and vol. 2, *Diseases Due to Bacteria*. A. W. Stableforth and I. A. Galloway, Eds. Academic Press, New York; Butterworths, London, 1959. 396 pp.; 414 pp. Illus. $18 each; 2 vols., $33.

The first two volumes of a proposed encyclopedic record of the infectious diseases of animals have now been published. The subject matter in these two volumes is limited to the diseases caused by bacteria; diseases caused by rickettsia, viruses, and protozoa are to be covered in later volumes of the series. The editors have assembled an imposing group of British authorities, and each member of the group has written in a field of his special interest. In spite of the plethora of authors, the two volumes have exceptional continuity and uniformity.

The first volume contains chapters on actinomycosis and actinobacillosis, anthrax, brucellosis, clostridial diseases, coliform diseases, corynebacterial diseases, fungal diseases, glanders and melioidosis, Johne's disease, leptospirosis, and listeriosis. The second volume covers necrobacillosis, pasteurellosis, the pleuropneumonia group of diseases, swine erysipelas, tuberculosis, and vibrosis. The chapters are arranged alphabetically, a valuable point for the student.

Each causative agent is described in thorough detail, and in most instances the epidemiological and clinical features are adequately covered. The gross lesions are usually listed and described in some detail under "pathology," but rarely are microscopic lesions described. A few photomicrographs are used, but most of these are not of good quality. The other illustrations, particularly the charts, tables, and line drawings, although used sparingly, are informative and of good quality. The type is easily readable, and the paper is excellent.

The authors obviously made good use of the literature, particularly that

published in Great Britain and North America, and a list of references is found at the end of each chapter. In general, Bergey's *Manual of Determinative Bacteriology* is followed for the classification and nomenclature of bacteria. In most cases use is made of the currently favored name of an organism (for example, *Fusiformis necrophorus*). No mention is made of the many other names which have at one time or another been acceptable for the same organism. The inclusion of some of these older names (even parenthetically) might have been helpful in many instances.

In general, these two volumes are complete and authoritative, and each should be in the library of everyone who is seriously interested in animal disease.

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Introduction to Statistical Communication Theory. David Middleton. McGraw-Hill, New York, 1960. 1140 pp. Illus. $25.

At first glance, this is a very impressive volume on a subject which is not adequately treated in textbook form. However, its very size raises the question of the purpose of this book. Surely only a massive course of lectures would require even a quarter of the material contained in this book. For this reason it might appear to be an imposition on the students to require that they purchase a text at this price; however, there are other objections to the use of this volume as a text. Matters of price aside, I find Middleton's book to be quite diffuse and without emphasis on what is, and what is not, important knowledge of the statistical foundations of communication systems analysis. In addition, the notation is often cumbersome and distracting.

As far as subject matter is concerned, the table of contents omits nothing that is relevant to the field; there are chapters on statistical ensembles, spectra and correlation functions, sampling and interpolation, information theory, Gaussian processes, Langevin and Fokker-Plauck equations, thermal noise, rectification of amplitude-modulated waves, optimum filtering, and finally, a large section on decision procedures applied to reception systems. However, length does not necessarily imply complete coverage of all of these subjects. For example, the relatively simple proof that a one-dimensional, stationary Gaussian process will be Markoffian if, and only if, the autocorrelation function is an exponential is left as a problem. The same is true in the case of many other important results. Random walks are discussed, but only enough to whet the reader's appetite. The simpler and shorter discussion of random walks which is given in Feller's book is more illuminating regarding the transition from the discrete random walk to the diffusion equation.

Although the preceding remarks might be regarded as sanguine, I find Middleton's book to be eminently suitable as a reference work for those who are familiar with communication theory. It is a very nearly complete summary of our present knowledge (although some important topics such as the Siegert-Darling theory of linear functionals of random signals are only mentioned) together with a more than adequate bibliography. If the reader can supply his own emphasis, this is a valuable compendium on communication theory.

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New Books

General

Gubnitz, Myron B. *Rocketship X-15*. Messner, New York, 1960. 288 pp. $4.95. Story of the experimental aircraft designed to take man higher and faster than ever before.

Harwell, George C. *Technical Communication*. Macmillan, New York, 1960. 342 pp. $3.75. A textbook that is primarily intended for the engineering student; chapters 5, 6, and 7 discuss formal and informal reports and technical articles.

Jacobs, Jake. *Marineland Diver*. Dodd, Mead, New York, 1960. 190 pp. $4.

Johnson, Walter. *1600 Pennsylvania Avenue*. Presidents and the people, 1929–1959. Little, Brown, Boston, 1960. 400 pp. $6.

McGlothlin, William J. *Patterns of Professional Education*. Putnam's, New York, 1960, 316 pp. $6.75.

Marder, Daniel. *The Craft of Technical Writing*. Macmillan, New York, 1960. 414 pp. $5. A discussion of the principles of rhetoric basic to the writing situations encountered by scientists and technical men.

Thomson, Charles A. H., and Frances M. Shattuck. *The 1956 Presidential Campaign*. Brookings Institution, Washington, D.C., 1960. 397 pp. $5.

Mathematics and Physical Sciences

Ajzenberg-Selove, Fay, Ed. *Nuclear Spectroscopy*. Parts A and B. Academic Press, New York, 1960. 1184 pp. Parts A and B, $16 each; part B, prepublication price $14 until 31 August.

Emeléus, H. J., and J. S. Anderson, Eds. *Modern Aspects of Inorganic Chemistry*. Van Nostrand, Princeton, N.J., ed. 3, 1960. 622 pp. $7.75.

Emmett, Paul, H., Ed. *Catalysis*. Oxidation, hydration, dehydration, and cracking catalysts. vol. 7. Reinhold, New York; Chapman and Hall, London, 1960. 383 pp. $13.50. This volume completes the present series on catalysis. The contributors include J. K. Dixon, J. E. Longfield, L. B. Ryland, M. W. Tamele, J. N. Wilson, and M. E. Winfield.

Jacobs, Alan M., Donald E. Kline, Forrest J. Remick. *Basic Principles of Nuclear Science and Reactors*. Van Nostrand, Princeton, N.J., 1960. 270 pp. $6.50. An introduction to the design and use of nuclear reactors and radioisotopes.

Jacobs, Horace, Ed. *Advances in the Astronautical Sciences*. vol. 5. Plenum Press, New York, 1960. 364 pp. $8. This volume, the proceedings of the 2nd western national meeting of the American Astronautical Society (held 4–5 August 1959 in Los Angeles, Calif.), contains 26 reports covering space mechanics, control, and guidance; advanced propulsion and power; astronautical systems and space vehicle design; space communication and instrumentation; and lunar and planetary environment.

Karan, Pradyumna P. *Nepal. A Cultural and Physical Geography*. Univ. of Kentucky Press, Lexington, 1960. 104 pp. $10.

Linhart, J. G. *Plasma Physics*. North-Holland, Amsterdam; Interscience, New York, 1960. 289 pp. $7.

Mendelssohn, K. *Cryophysics*. Interscience, New York. 1960. 191 pp. Paper, $2.50; cloth, $4.50. An account of developments in this field up to the middle of 1959. Intended for advanced undergraduate or beginning graduate students.

Murphy, George M. *Ordinary Differential Equations and Their Solutions*. Van Nostrand, Princeton, N.J., 1960. 460 pp. $8.50.

Obert, Edward F. *Concepts of Thermodynamics*. McGraw-Hill, New York, 1960. 549 pp. $11.

Social Sciences

Gruliow, Leo, Ed. *Current Soviet Policies*. vol. 3, *The Documentary Record of the Extraordinary 21st Communist Party of the Soviet Union*. Columbia Univ. Press, New York, 1960. 243 pp. $6. Contains the record of the Congress as revealed in the government-controlled Soviet publications.

Hook, Sidney, Ed. *Dimensions of Mind*. A symposium. New York Univ. Press, New York, 1960. 294 pp. $5.

Mowrer, O. Hobart. *Learning Theory and Behavior*. Wiley, New York, 1960. 567 pp. $6.95.

Tibbitts, Clark, and Wilma Donahue, Eds. *Aging in Today's Society*. Prentice-Hall, Englewood Cliffs, N.J., 1960. 443 pp. $6. This book is an expansion of *Aging in the Modern World* (Univ. of Michigan Press, Ann Arbor).