largely to ignore the extensive and often relevant experimental literature, particularly the research bearing on the question of mediational meaning processes. His delightful literary examples, though, not only reflect the impressive range of his reading but exercise the model in a way that the usual oversimplified experimental material could not. Whatever the point of view, readers will recognize that this is a distinguished book that makes an enormous contribution to the psychology of language. It is a rich and difficult book. But there is material here to influence all of the disciplines with a claim to the study of language.

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The Principles of Biological Control. Interrelation of hosts and pests and utilization in regulation of animal and plant populations. Harvey L. Sweetman. Brown, Dubuque, Iowa, 1958. xii + 560 pp. Illus. $8.75.

It is the purpose of this book to acquaint the reader with life histories, habits, methods of handling, and methods of utilizing the organisms that might be used or now are being used for the control of insects and other pests. It is thus a survey and analysis of the world literature, in so far as such a survey is feasible, covering the broad field of biological control of plants and animals. For this purpose choice has been made of species that are well known or that show common variations in the biology of the various groups of organisms. General principles of biological control are stressed wherever feasible.

This is a revision and extension of a work entitled *Biological Control of Insects,* by Sweetman, published in 1936. An extensive bibliography, arranged by chapters, for reference and documentary purposes is included at the end of the text. The book will be especially useful to teachers, graduate students, and research workers.

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Mirror to Physiology. A self-survey of physiological science. R. W. Gerard. American Physiological Society, Washington, D.C., 1958. xi + 372 pp. $5.

The stupendous task of surveying a field of science is emphasized in this book. The detailed study, sponsored by the National Science Foundation, was started early in 1952 with the expectation that it would be completed in approximately two years. Numerous difficulties encountered in this pioneering venture delayed completion until late in 1957. Several intended goals could not be reached but are indicated in the text as worthy of further investigation. There is danger that survey data may become obsolete if there is delay in publication. The information on incomes in chapter 5 demonstrates this hazard.

The first chapters briefly summarize the survey and describe its origin, objectives, and operation. Difficulty is encountered in defining physiology because of its relation to biochemistry, biophysics, and many other fields of science. Perhaps a better name for this division of science would be "dynamic biology." Other chapters discuss occupational motivations, satisfaction, and mobility of physiologists; research programs, facilities, and support; publications and societies; training and recruitment; and the public and physiology. The final chapter is devoted to recommendations based on the interpretation of the survey findings. The appendixes (107 pages) are a useful conclusion to the book.

In reviewing this text, one is impressed with the great effort spent in collecting, clarifying, and interpreting data and ideas for a better understanding and appreciation of physiology. It should prove a very useful reference source for administrators and students.

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Relativity for the Layman. James A. Coleman. (A Mentor book.) The New American Library, New York, 1958. 127 pp. Illus. $0.50.

This is a paperback edition of the 1954 book of the same title, which was reviewed in the *Scientific Monthly* in September 1955.

A great deal of allowance must undoubtedly be made for the necessity for using the popular form of scientific writing. One wonders, however, whether the author should not be criticized for suggesting (page 118) that it may be possible at some time in the future for an astronomer with a powerful telescope to look around the finite universe and see the back of his own head. Mention of the time required for light to travel through such a distance appears to be in order.

Must we not also call it an error to say (page 24) that the sun actually rises eight minutes before it appears to rise? Is the author forgetting that it is the rotation of the earth which brings about the rising of the sun? After the earth has turned to the proper position for sunrise, no further eight-minute waiting period is necessary.

These errors are minor, however, when compared with the author's handling of the "clock paradox"—an error that did not appear in the first edition, which made no attempt to answer the question. He is quite correct in saying that there is no paradox, but wrong in his implication that there is no difference in the ages of twins after one of them has taken a round trip to a star. As d'Abro has said in *The Evolution of Scientific Thought from Newton to Einstein,* "this particular consequence of the theory has been one of the stumbling blocks of practically every lay writer who has devoted his time to criticising the theory of relativity." And we must enlarge the group to include others who profess belief in the theory but have not made a thorough study of it. There is no room for opinion in the matter, and, as a result, mathematical physicists are virtually unanimous in their acceptance of the age difference. On the basis of both experiment and theory we have every reason to believe that travel will help to preserve youth.

Coleman has made a few improvements in the new edition—for instance, in the historical accuracy of his account of Roemer's measurement of the velocity of light through observations of Jupiter's moons.

After cautioning them against the author's treatment of the "clock paradox," I shall gladly recommend the book to my students. Inexpensive popular books on science are doing a great deal to familiarize our young people with scientific concepts. This is especially true when the reading is as palatable as it is in Coleman's little book.

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Scientists' Choice. A portfolio of photographs in science selected and described by leading scientists. F. M. Branley, Ed. Basic Books, New York, 1958. $4.95.

This is a collection of excellently reproduced photographs—self-matted, 11 by 14 inches in size, and suitable for hanging on the walls of a laboratory, study, library, or office. The subject matter ranges from the microcosmic to the macrocosmic.

In the microcosmic field are an electron micrograph of bacteriophage, an x-ray diffraction pattern of an ice crystal, and a living cell seen through a phase-contrast microscope. The macrocosm is represented by photographs of the fantastic Horsehead nebula, in the

constellation of Orion, and the Crab nebula—the latter taken in crimson light, which reveals structures not visible to normal vision.

Included in the portfolio is a booklet, *Using Your Camera in Science* (31 pages), by Jerry A. Schur, head of the photography department at Stuyvesant High School in New York. This pamphlet is too brief to be of much use to any but the veriest tyro in photography.

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Einführung in Theorie und Anwendung der Laplace-Transformation. Ein Lehrbuch für Studierende der Mathematik, Physik und Ingenieurwissenschaft. Gustav Doetsch. Birkhäuser, Basel, Switzerland, 1958. 301 pp. Illus. F. 39.40.

Many books, most of them designed primarily for engineers, have been written on the Laplace transform—for example, the various books under such titles as "Operational Calculus," "The Mathematics of Circuit Analysis," and so forth. In many cases the authors have made haste to make applications to differential equations, with the result that the essential mathematical theory has been either largely omitted or only carelessly handled, and the conditions under which the theorems used are valid have often not been properly stated. Proofs, if given at all, have seldom been adequate. In contrast, the mathematical treatises on the subject have been extensive. To fill this gap between theoretical treatises and typical engineering texts, Doetsch has written this excellent book.

After a brief mathematical and physical introduction to the Laplace integral, the theory is systematically developed. Questions of convergence and uniqueness are immediately faced. Chapters follow on the Laplace transform as an analytical function and on the transform under integration, differentiation, and convolution. The theory is then applied to initial value problems in ordinary differential (and difference) equations. The physical illustrations are well chosen. Next, there are developed the theory of the complex inversion formula, the Fourier transform and integral theorems, the bilateral Laplace transform, deformation of path of integration, residual theorems, expansion theorems, Parseval's equation, asymptotic behavior of the subsidiary and original functions. Chapters on differential equations with polynomial coefficients, partial differential equations, and integral equations are given.

The book is clearly written. Great care has been taken to prove each theorem in detail, particularly in the forms required for applications. A wealth of examples to illustrate theory and the mathematical and physical applications are worked out carefully and completely. Throughout, the logical procedure which underlies the entire field can be clearly discerned.

A basic familiarity with the elements of real and complex analysis is assumed. Those working in fields utilizing transform theory will find this volume extremely useful.

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Frontiers in Cytology. Sanford L. Palay, Ed., Yale University Press, New Haven, 1958. xii + 529 pp. Plates. $9.75.

This volume, dedicated to the memory of the late Henry Bunting of Yale University, includes a biography of Bunting (by W. S. Albrink) and a bibliography of his writings, together with 16 reviews written by distinguished authors and covering research frontiers in the field of cytology. The reviews and their contributors are as follows: "Henry Bunting," W. S. Albrink; "Current concepts of cellular structures," E. W. Dempsey; "Structural specializations of the cell surface," D. W. Fawcett; "Chromosomes: Their constitution and function," A. R. T. Denues; "Studies on mitosis in purine-treated tissue cultures," J. J. Biesele; "Changes in the desoxyribonucleoprotein complex during the cell cycle," D. P. Bloch; "Pentosenucleic acids in relation to nuclear and cytoplasmic functions," J. I. Nurnberger and M. W. Gordon; "Intracellular Lipides: Their detection and significance," H. W. Deane; "Some aspects of protein histochemistry, with special reference to protein hormones," R. J. Barrnett; "A small particulate component of the cytoplasm," G. E. Palade; "The morphology of secretion," S. L. Palay; "The cytology of striped muscle," H. S. Bennett; "Cell transformation and differentiation in regenerating striated muscle," G. C. Godman; "Pathological swelling and vacuolization of cells," E. E. Manuelidis; "Cellular reaction during virus infections," W. H. Gaylord, Jr.; "The dermal ground substance of the mesenchyme as an element of natural resistance against infection and cancer," F. Duran-Reynals; and "Collagen and reticulin," W. G. Banfield.

These reviews, delivered as lectures in the winter of 1955, collected by the editor (S. L. Palay) during 1956, and in many instances brought up to date in the spring of 1957, cover a wide range of topics of contemporary interest in modern cytology. The material is well organized, the reviews are written in a concise, clear style, and the content is fully substantiated by frequent reference to the world's scientific literature. For example, more than 2000 original publications are cited in this work. The illustrations, 253 in all, are collected as plates at the end of the volume and are of good quality. The index slightly exceeds eight pages and completes this fine volume, which can be recommended to all who are interested in the achievements of modern cytology.

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New Books

Library of Medicinal Plants. Collected by Henry G. de Laszlo. Heffer, Cambridge, England, 1958. 56 pp. 10s. 6d. List of more than 1500 books and pamphlets (published since 1700) on phytotherapy, by author, title, place, and date of publication.

Logic Machines and Diagrams. Martin Gardner. McGraw-Hill, New York, 1958. 166 pp. $5.

Magic and Religion. Their psychological nature, origin, and function. George B. Vetter. Philosophical Library, New York, 1958. 555 pp. $6.

Men, Molds, and History. Felix Marti-Ibanez. MD Publications, New York, 1958. 114 pp. $3.

Metamorphic Reactions and Metamorphic Facies. Memoir 73. W. S. Fyfe, F. J. Turner, J. Verhoogen. Geological Soc. of America, New York, 1958. 271 pp.

Microsomal Particles and Protein Synthesis. Papers presented at the first symposium of the Biophysical Society, at the Massachusetts Institute of Technology, Cambridge, Massachusetts, 5, 6, and 8 February 1958. Richard B. Roberts, Ed. Pergamon, New York and London, 1958. 178 pp. $5.

Mineralogy and Geology of Radioactive Raw Materials. E. Wm. Heinrich. McGraw-Hill, New York, 1958. 668 pp. $14.50.

Nomenclature of Plants. A text for the application by the case method of the International Code of Botanical Nomenclature. Harold St. John. Ronald, New York, 1958. 164 pp. $2.50.

Nuclear Reactors for Power Generation. E. Openshaw Taylor. Philosophical Library, New York, 1958. 151 pp. $7.50.

Perkin Centenary, London. 100 years of synthetic dyestuffs. Pergamon, London, 1958. 148 pp. $7.50. This volume contains the four lectures delivered at the Royal Institution, London, as one of the events of the Perkin centenary celebrations. The lectures were "The life and work of Perkin" by John Read, "The development of the dyestuffs industry" by Clifford Paine, "The tinctorial arts today" by John Gwynant Evans, and "The development of organic chemistry since Perkin's discovery" by Alexander Todd.