

numerical methods. Two final chapters relate to the origin of partial differential equations and the solution of boundary-value problems by Fourier series.

The logical and pedagogical presentation is handled with skill. Basic problems of existence and uniqueness are pointed out and disposed of by quoting theorems, with appropriate reference to proofs elsewhere. In the treatment of applications, derivations of a number of equations are given in detail, based on physical principles.

The collection of up-to-date practical problems is excellent. Numerous exercises with answers are given in each chapter; these fall into three categories: standard drill problems; more interesting, involved problems; and problems intended to broaden the scope of the text.

I would like to have seen a chapter stressing geometrical aspects. The sketching of integral curves in the phase plane by the method of isoclines would have led at once to a discussion of nodes, centers, foci, and so on. Questions of stability, existence of limit cycles, and so forth, would come next, all treated qualitatively and to some extent intuitively.

The questionable and long-standing practice of presenting something on partial differential equations in a text such as this, which, in my opinion, really should be devoted to ordinary differential equations, is followed here. Space which could have been devoted to such topics as Hurwitz stability criterion, asymptotic series solutions, further details on numerical methods, and geometry is lost.

A little amplifying by the instructor along the lines indicated should make this book, however, a most satisfactory text.

HUGH L. TURRITTIN

*Department of Mathematics,
Institute of Technology,
University of Minnesota*

Human Infertility. C. Lee Buxton and Anna L. Southern. With a chapter on endometrial diagnosis by Earl T. Engle. Harper, New York, 1958. x + 229 pp. Illus. \$7.50.

This little volume was written by authors well known for their contributions in the field of involuntary infertility—medical doctors who were trained where exposure to basic research in the physiology of human reproduction was incapable.

The diagnosis and treatment of the infertile couple is complicated, first by the fact that sterility concerns two individuals, not one. In this book the major attention is given to the female partner; the importance of examination of the

male is emphasized, but treatment of the infertile husband the authors leave to the urologist.

Many variables are involved in a diagnosis of sterility; this renders research only partially susceptible to rational statistical analysis. Enough statistics are given in this book to enable the physician roughly to estimate the effect of his treatment; the difficulty of evaluating different types of treatment is increased where the follow-up reveals the fact that, whether the patient is treated or not, the cumulative percentage of "cures" gradually increases, either spontaneously or as a result of treatment, at least for 10 or 12 years.

Much is made of the psychological factor. The beneficial effect merely of the quieting assurance of the wise physician has been noted by many. The rather surprising finding that the greatest percentage of pregnancies in the authors' study population of some 2000 patients occurred during the first months of investigation implies that factors other than treatment are at work. The conservatism implicit in this statement is characteristic of the book. While cautioning against undue enthusiasm with respect to corrective measures employed, the authors proceed to evaluate the therapeutic measures which, research has shown, bring about a certain percentage of cures. For the general reader of *Science* the book gives a brief and authoritative clinical abstract of the sterility problem.

For the general reader, too, the authors present as background the basic physiological processes in human reproduction. There is a chapter on the methods of diagnosing whether or not ovulation takes place—methods that depend on basal body temperature, determination of urinary pregnanediol, and endometrial biopsy. To help evaluate the last method, there is included a chapter on "Endometrial interpretation," by the late Earl T. Engle, to whom the book is dedicated as the authors' "guide, friend and preceptor."

For the physician, the current methods of diagnosing causes are presented and evaluated in the light of the authors' not inconsiderable experience over a decade.

As the results of tests for ovulation give information on the endocrine status of the sterile woman, particularly with reference to the pituitary gland, the ovaries, the adrenal cortex, and the thyroid, the activity of these glands is carefully evaluated. The clinical importance of the *cervix uteri* for the entrance of spermatozoa and the patency of the fallopian tube, through which sperms must ascend to the ampulla and through which the egg descends to the uterus, are discussed in detail.

The role of prenatal death of the ovum due to genetic causes is not mentioned, probably because there is nothing one can do about it, and stimulation of a laggard ovary by irradiation is not endorsed because "geneticists advise against this type of therapy."

In the chapter on the sociological implications of efforts to correct sterility, the authors point out that such efforts concern the individual's right to have children, if it is at all possible, and that medical help in this direction will have no great impact on the frightening demographic problem of overpopulation that faces the world.

CARL G. HARTMAN

*Ortho Research Foundation,
Raritan, New Jersey*

Principles of Physical Chemistry. An introduction to their use in the biological sciences. Wallace S. Brey, Jr. Appleton-Century-Crofts, New York, 1958. vii + 433 pp. Illus. \$7.

Intended as a textbook to be used in a one-semester course for premedical students, this book is strengthened in that purpose by limited examples in which physicochemical principles are applied to biology. Consistent with the objective is the serious attempt to employ only the simplest mathematical operations. In a few cases, this causes fundamentally easy derivations to appear complex, but usually the author has achieved his desired effect of inspiring confidence in the validity or reasonableness of equations without the tedium or complication of detailed development.

The book is about half as long as most of today's textbooks in physical chemistry. This has required that there be deletions or extreme brevity in some fields. There is nothing about the phase rule, solid solutions, or eutectics and very little about the solid phase. Except for solutions of electrolytes, the treatment of homogeneous equilibrium is fragmentary; the kinetics of heterogeneous equilibrium are omitted altogether. Even more surprising, in a book for biologists, is the confinement of photochemical reactions within one short sentence. The discussion of photosynthesis is separate and almost as brief. Nevertheless, these are prices that must be paid to reach a group who never try very hard to learn physical science. Despite the exceptions mentioned, nearly all customary topics have been included and accorded adequate treatment.

The author appears not to acknowledge the jurisdiction of the General Conference on Weights and Measures or the national standardizing laboratories to determine the temperature scale. He gives

the triple point of water as 0.0098°C, although the Ninth General Conference on Weights and Measures (1948) adopted [*Science* 109, 100 (1949)] and the Tenth Conference (1954) reaffirmed [*Science* 120, 1008 (1954)] the triple point of water as 0.0100° Celsius (centigrade), thus displacing, as a fundamental fixed point, the inexact and ill-defined freezing point of water under atmospheric conditions.

Brey has fine gifts for direct, clear, and interesting exposition. Except in those chapters where the condensation has caused a sense of breathless haste, the treatment moves forward smoothly, faultless language serving to establish the degree of comprehension that the writer has deemed reasonable. The purposes of the book are good, and minor technical imperfections of fact or treatment do not seriously detract or keep it from presenting physical chemistry in a way that will specifically suit the early student of biological science.

CHARLES PROFFER SAYLOR
Chemistry Division,
National Bureau of Standards

New Books

Electronic Measuring Instruments. E. H. W. Banner. Macmillan, New York, ed. 2, 1958. 512 pp. \$7.95.

Selected Writings of John Hughlings Jackson. vol. I, *On Epilepsy and Epileptiform Convulsions.* vol. II, *Evolution and Dissolution of the Nervous System. Speech. Various Papers, Addresses and Lectures.* James Taylor, Ed. Basic Books, New York, 1958. 514 pp.; 518 pp. \$15 per set.

The Evolution of Development. Three special lectures given at University College, London. John Tyler Bonner. Cambridge Univ. Press, New York, 1958. 110 pp. \$3.50.

Psychopharmacology. Pharmacologic effects on behavior. Harry H. Pennes. Hoeber-Harper, New York, 1958. 375 pp. \$8.

We, the Tikopia. A sociological study of kinship in primitive Polynesia. Raymond Firth. Allen & Unwin, London, ed. 2, 1958 (order from Macmillan, New York). 631 pp. \$7.50.

Thinking. An experimental and social study. Basic Books, New York, 1958. 203 pp. \$4.

Borradaile's Manual of Elementary Zoology. Revised by W. B. Yapp. Oxford Univ. Press, New York, 1958. 777 pp.

Frontiers in Science. A survey. Edward Hutchings, Jr., Ed. Basic Books, New York, 1958. 362 pp. \$6.

Language, Thought, and the Human Mind. Chester A. Lawson. Michigan State Univ. Press, East Lansing, 1958. 117 pp. \$4.50.

Langenscheidts Fachwörterbuch Wehrwesen. Englisch. Englisch-Deutsch. Deutsch-Englisch. Friedrich Krollmann. Philosophical Library, New York; Langenscheidt, Berlin, 1957. \$10.

The Evolution of Genetic Systems. C. D. Darlington. Basic Books, New York, rev. ed. 2, 1958. 275 pp. \$5.50.

Structure and Evolution of the Stars. Martin Schwarzschild. Princeton Univ. Press, Princeton, N.J., 1958. 314 pp. \$6.

Textbook of Organic Chemistry. Carl R. Noller. Saunders, Philadelphia, ed. 2, 1958. 664 pp.

Upper Cretaceous of the Pacific Coast. Memoir 71. F. M. Anderson. Geological Soc. of America, New York, 1958. 378 pp.

Biology and Human Progress. Louis Eisman and Charles Tanzer. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1958. 560 pp.

Experimental General Chemistry. J. W. Neckers, T. W. Abbott, K. A. Van Lente. Crowell, New York, ed. 3, 1958. 325 pp. Paper, \$3.50.

The Study of Comparative Government and Politics. Gunnary Heckscher. Macmillan, New York, 1957. 172 pp. \$4.25.

A Critical Review of the Techniques for Testing Insecticides. J. R. Busvine. Commonwealth Inst. of Entomology, London, 1957. 208 pp. 30s.

Theory of Psychoanalytic Technique. Menninger Clinic Monogr. Ser. No. 12. Karl Menninger. Basic Books, New York, 1958. 219 pp. \$4.75.

Experiments in Physical Science. Allen D. Weaver and James F. Glenn. Brown, Dubuque, Iowa, 1958. 196 pp. \$3.

Actions chimiques et biologiques des radiations. "Radiolyse de liquides organiques," Milton Burton; "Polymérisation amorcée par les radiations ionisantes," A. Chapiro and M. Magat; "Effets des rayonnements de grande énergie sur les polymères," A. Charlesby. Masson, Paris, 1958. 222 pp.

Teaching High School Science: A Book of Methods. Paul F. Brandwein, Fletcher G. Watson, Paul E. Blackwood. Harcourt, Brace, New York, 1958. 598 pp.

Principles of Geochemistry. Brian Mason. Wiley, New York; Chapman & Hall, London, ed. 2, 1958. 317 pp. \$8.50.

Foundations of Information Theory. Amiel Feinstein. McGraw-Hill, New York, 1958. 147 pp. \$6.50.

The Origins of the English Library. Raymond Irwin. Allen & Unwin, London, 1958 (order from Macmillan, New York). 255 pp. \$4.50.

Foundations of Embryology. Bradley M. Patten. McGraw-Hill, New York, 1958. 594 pp. \$9.50.

Electronic Instrumentation for the Behavioral Sciences. Clinton C. Brown and Rayford T. Saucer. Thomas, Springfield, Ill., 1958. 174 pp. \$5.50.

African Economic Development. William A. Hance. Harper (for the Council on Foreign Relations), New York, 1958. 317 pp. \$4.95.

Les Limitations internes des formalismes. Etude sur la signification du théorème de Gödel et des théorèmes apparentés dans la théorie des fondements des mathématiques. Jean Ladrière. Nauwelaerts, Louvain, Belgium; Gauthier-Villars, Paris, 1957. 728 pp. Bel. F. 650.

A Primer of Cerebral Palsy. Joseph D. Russ and Hyman R. Soboloff. Thomas, Springfield, Ill., 1958. 77 pp. \$4.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, but to the publisher or agency sponsoring the publication.)

Le Climat Pluviométrique des Basses Cévennes. Monographies de la Météorologie Nationale, No. 7. R. Rebotier. 28 pp. *Prévision du Temps sur le Bassin du Congo.* Monographies de la Météorologie Nationale, No. 9. G. Jeandidier and P. Rainteau. 13 pp. Ministère des Travaux Publics, des Transports et du Tourisme, Paris, 1957.

ECPD, 25th Annual Report for the Year Ending September 30, 1957. Engineers' Council for Professional Development, New York 18, 1958. 79 pp. \$1.

Licht, Materie, Weltall im Einheitlichen Naturbild. Ewald Helmut Lupfert. Birkenkopf, Stuttgart, Germany, 1958. 76 pp. DM. 4.

Plant Physiology. Laboratory exercises. Paul C. Lemon. Brown, Dubuque, Iowa, 1958. 171 pp. \$3.

1958 Heat Transfer and Fluid Mechanics Institute. Preprint of papers. Held at University of California, Berkeley, 19-21 June 1958. Stanford Univ. Press (for the Heat Transfer and Fluid Mechanics Inst.), Stanford, Calif., 1958. 264 pp. \$8.50.

Development, Growth, and State of the Atomic Energy Industry. Hearings before the Joint Committee on Atomic Energy, Congress of the United States, Eighty-Fifth Congress, Second Session. Joint Committee on Atomic Energy, Washington, 1958 (order from Supt. of Documents, GPO, Washington 25). 624 pp.

School Finance and School Business Management. Responsibilities and Services of State Departments of Education. Misc. No. 29. Clayton D. Hutchins, Albert R. Munse, Edna D. Booher. U.S. Office of Education, Washington, 1958 (order from Supt. of Documents, GPO, Washington 25). 78 pp. \$0.60.

Distribution of Meteoritic Debris about the Arizona Meteorite Crater. Contrib. to Astrophysics, vol. 2, No. 7. John S. Rinehart. 16 pp. \$0.20. *Orbital Data and Preliminary Analyses of Satellites 1957a and 1957b.* Contribs. to Astrophysics, vol. 2, No. 10. Compiled by F. L. Whipple, L. G. Boyd, J. A. Hynek, G. F. Schilling. 50 pp. \$1. Smithsonian Institution, Washington 25, 1958 (order from Supt. of Documents, GPO, Washington 25).

Health Statistics: Origin and Program of the U.S. National Health Survey. A description of the developments leading to enactment of the National Health Survey Act, and a statement of the policies and initial program of the survey. 36 pp. \$0.25. *Health Statistics: Preliminary Report on Numbers of Persons Injured, United States, July-December 1957.* Statistics on the number of persons injured, the number of days of disability due to injuries, and class of accident. Based on data collected in household interviews during July-December 1957. 32 pp. \$0.30. U.S. Department of Health, Education, and Welfare, Washington, 1958 (order from Supt. of Documents, GPO, Washington 25).