chologist since James Mill has given us a neater, cleaner, simpler analysis of the human mind.

Among contemporary American psychologists, Skinner has perhaps the greatest appeal to those who like to think of psychology as an exact science. He has five substantial books to his credit, and a great number of articles; all of these demonstrate the importance of the stimulus-response-reinforcement principle. *Cumulative Record* is a reprint of his most important articles, carefully arranged and annotated in such a way as to make the sequence intelligible. Psychologists will be grateful that these papers are now more accessible. Scientists from other fields will find in this volume reassuring evidence that psychology can be made to conform to the Newtonian conception of science.

Some readers may find Skinner's conceptual framework a bit constricting, but none can fail to admire the skill with which he reduces the complexities of behavior to the simplest possible terms, or to envy the serenity with which he looks forward to a world in which the behavior not merely of the rat and the pigeon but also of man can be precisely predicted and expertly controlled. I recommend particularly part 2, "A case history of scientific method," and the two articles in part 3 on the technology of education. *Cumulative Record* is not quite complete enough, however, to give us a full understanding of what psychology can do with human behavior. The reader is urged to glance through Skinner's most recent substantive work, *Verbal Behavior* (Appleton-Century-Crofts, New York, 1957), and then to examine critically N. Chomsky's detailed appreciation of that book *Language* [**35**, 26 (1959)].

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Fundamental Aspects of Reactor Shielding. Herbert Goldstein. Addison-Wesley, Reading, Mass., 1959. xvi + 416 pp. $9.50.

Reactor shielding is a complicated and difficult specialty within the field of nuclear engineering which has received much attention because of its importance for military mobile reactors. The basic mathematical problems of shielding—namely, the computation of the deep penetration of gamma rays and neutrons—are, even in relatively simple cases, much more severe than the problem of computing the criticality of a simple reactor. Reactor theory centers essentially on eigenvalue problems, and there is a single, clearly defined measure of the validity of the theory—how well the computed and the experimental critical masses agree; in shielding theory there is no comparably simple criterion of validity—both the measurement and the calculation of fluxes at large distances are fraught with difficulties and uncertainties.

Because of this basic difficulty, the science of shielding has had to proceed as a blend of semirigorous calculation, experimental intuition, and even, on occasion, black magic. This essential flavor of the shielding art is admirably caught by Goldstein's book. That much of the discussion is not rigorous is surely an accurate reflection of the fundamental nature and difficulty of the shielding problem, as compared, say, with the problem of criticality of reactors.

As the author says in his preface, the book has much of the character of a review rather than of a monograph: for example, in many of the mathematical derivations reference is made to works quoted in the bibliography. The review, however, is a critical one, and the author does not hesitate to point out shortcomings in both shielding experiments and theories.

The book is divided into three major parts: first, a description of the general problem of reactor shielding and of the radiation sources against which shielding is necessary; second, a description of the experimental techniques and devices developed in the United States for carrying out shielding experiments; and third, a review of the mathematical theory of deep penetration of gamma rays and neutrons, together with experimental comparisons.

The writing is fluid and breezy. However, in some cases the cant of the shielding expert is used in a way which may prove confusing to the beginner—for instance, the build-up factor is mentioned on page 15 before it is defined, and the Bragg-Gray principle is invoked without a full explanation. Since many of the real problems of shielding are associated with mobile—that is military—reactors, much of the development described by Goldstein was classified information at the time it originated. As a result, references must sometimes be made to literature which is still classified, a certain source of annoyance to those readers who do not have access to the classified literature.

Although it is written from the point of view of reactor shielding, Goldstein's book will be useful, and can be recommended, to all who have to deal with radiation shielding—whether of isotopes, medium-energy accelerators, or reactors. As befits a review-type book, the bibliography is superb, even though confined largely to the American literature.

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Women and Work in America. Robert W. Smuts. Columbia University Press, New York, 1959. x + 180 pp. $4.50.

In this small, easy-to-read book the author contrasts women's work (chapter 1) and working women (chapter 2)—their conditions of work (chapter 3), their attitudes, and the attitudes of others toward them (chapter 4)—at the turn of the century with current mid-century practices and attitudes in the United States. He quotes extensively from contemporary sources, as he did in his earlier monograph, *European Impressions of the American Worker*—also a product of his research for Columbia University's Conservation of Human Resources Project.

Drawing heavily on Census statistics, too, the author sketches today's women workers as essentially well off by comparison with their earlier counterparts. He finds more striking than changes in their occupations in the labor market "the shift of wives and mothers from household activities to the world of paid employment." But, he observes, "Today, as always, most of the time and effort of American wives is devoted to their responsibilities within the home and family circle." He concludes that "once her children are in school, the modern mother has more freedom of choice than the single woman had in 1890." Working conditions, he reports, are better for most women workers, but barriers to training and advancement still exist, along with disagreement about legislation aimed at their removal. In the modern separation of home and work Smuts sees the origin of the dilemma of the woman of today who wants to achieve success in her work without neglecting family responsibilities. He notes that our modern economy creates a similar problem for men. Examining the "causes

rather than the momentous consequences of changes in women's work," he offers no predictions except that the increasing employment of wives and mothers will "leave a deep imprint on every side of American life during the second half of the century."

The flaws in this interesting, documented, quotable book affect the research worker more than the casual reader. Among such flaws are Smuts' failure to mention inflation as a cause of employment of women, especially of older women and widows; his failure to cite such basic discussions of his subject as Hazel Kyrk's, in *The Family in the American Economy*; and a style of citing sources that is onerous to a reader interested in dates of publication.

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Celestial Mechanics. E. Finlay-Freundlich. Pergamon Press, New York, 1958. viii + 150 pp. $7.50.

In a small volume on a subject as vast as celestial mechanics it is impossible to give more than a general introduction and an exposition of a few selected topics.

The introductory material consists of an elementary treatment of the two-body problem and a chapter on the *n*-body problem, with emphasis on Lagrange's stationary solutions. This chapter concludes with a discussion of Hill's curves of zero velocity in the restricted problem of three bodies and the periodic solutions in the vicinity of the stationary solutions.

One of the topics that the author selected for more detailed treatment is contained in the chapter entitled "Application of the theory of Hamilton-Jacobi to the three-body problem." The theory of canonical transformations is presented briefly but adequately. The integration of the two-body problem by Jacobi's method is then given as preparation for applications to perturbational problems, an outline of which is presented in the next chapter.

Two more topics are treated in considerable detail: "the two-body problem for extended deformable bodies" and "the motion of the apsidal line in relativistic mechanics."

The book will serve as a useful introduction to the subject for students with adequate mathematical preparation. The serious student will find his appetite whetted for more, especially for more concerning applications of the Hamilton-Jacobi theory to the problem of perturbations. The bibliographies given in the various chapters will direct him to some of the standard works, but these are not detailed enough to offer specific help.

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Landscape from the Air. A physical geography in oblique air photographs. F. J. Monkhouse. Cambridge University Press, New York, 1959. ix + 53 pp. Illus. Paper, $1.75.

Air photography has brought a new tool to the classroom. Geographers, geologists, foresters, pedologists, engineers, planners, military leaders, and others all make extensive use of air photographs—pictorial likenesses mechanically achieved. About 45 percent of the earth's land area has been photographed from the air; coverage of the United States is virtually complete.

Landscape from the Air was written primarily for geographers and geologists, for use in conjunction with topographic maps to envisage types of landscape that one might never be able to visit in person. Fifty-two oblique aerial photographs —most of them of Europe but some of North America, Africa, and Asia—are used to depict landscapes, under the following headings: "Rock types"; "Structure"; "Vulcanicity"; "Earth sculpture"; "Underground drainage"; "Rivers and river valleys"; "Glaciation"; "Desert lands"; "Coast lines"; and "Lakes and lake-basins." The photographs used were carefully and meticulously selected from among thousands.

Beneath each photograph are given the names of major features and the short numbers of the relevant topographic maps. Moreover, in the majority of instances the exact orientation of the photograph is given. Then follows a brief description of the main features to be seen in the photograph. Every effort has been made to make the text self-explanatory, but to get the most from a given illustration the "photo-interpreter" should have some background knowledge of geography and geology, for only then will he know what to look for. Proper interpretation of aerial photographs is positively dependent on professional competence.

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New Books

Analysis of Linear Systems. David K. Cheng. Addison-Wesley, Reading, Mass., 1959. 439 pp. $8.50.

Astronomy. Theodore G. Mehlin. Wiley, New York; Chapman & Hall, London, 1959. 400 pp. $7.95.

The Economics of Freedom. American capitalism today. Massimo Salvadori. Doubleday, Garden City, N.Y., 1959. 264 pp. $4.50.

Free Radicals. An introduction. A. F. Trotman-Dickenson. Methuen, London, Wiley, New York, 1959. 148 pp. $2.50.

Geochemical Methods of Prospecting and Exploration for Petroleum and Natural Gas. A. A. Kartsev, Z. A. Tabasaranskii, M. I. Subbota, G. A. Mibilevskii. English translation edited by Paul A. Witherspoon and William D. Romey. Univ. of California Press, Berkeley, 1959. 372 pp. $12.50.

Handbook of Diet Therapy. Dorothea Turner. Univ. of Chicago Press, Chicago, Ill., ed. 3, 1959. 237 pp. $5.

The Harvey Lectures. Delivered under the auspices of the Harvey Society of New York, 1957–1958. Series 53. Academic Press, New York, 1959. 269 pp. $7.50. Contents: "An epidemiological study of illness in families," J. H. Dingle; "Myxomatosis in Australian wild rabbits—evolutionary changes in an infectious disease," F. Fenner; "Structure and infectivity of tobacco mosaic virus," H. Fraenkel-Conrat; "Bacterial reproduction," J. Lederberg; "Enzymatic synthesis of deoxyribonucleic acid," A. Kornberg; "Some reactions of lymphoid tissues to stimulation by antigens," A. H. Coons; "Cell division," D. Mazia; "Correlation of roentgenological and pathological changes in some diseases of the lung," J. Gough; "Extracorporeal maintenance of cardiorespiratory functions," J. H. Gibbon, Jr.

The Invertebrates. Smaller coelomate groups: Chaetognatha, hemichordata, pogonophora, phoronida, ectoprocta, brachipoda, sipunculida, the coelomate bilateria. vol. 5. Libbie Henrietta Human. McGraw-Hill, New York, 1959. 791 pp. $13.50.

Linear Network Analysis. Sundaram Seshu and Norman Balabanian. Wiley, New York; Chapman & Hall, London, 1959. 585 pp. $11.75.

The Many Body Problems. Summer school course in theoretical physics given at the University of Grenoble, 1958. Wiley, New York; Methuen, London; Dunod, Paris, 1959. 675 pp. $15.

Medical Museum Technology. J. J. Edwards and M. J. Edwards. Oxford Univ. Press, New York, 1959. 182 pp. $3.40.

Organic Chemistry. Melvin J. Astle school course in theoretical physics given 1959. 781 pp. $7.50.

Package Design Engineering. Kenneth Brown. Wiley, New York; Chapman & Hall, London, 1959. 276 pp. $8.50.

Physiology of Insect Development. Frank L. Campbell, Ed. Univ. of Chicago Press, Chicago, Ill., 1959. 181 pp. $4.

Plane Trigonometry. A. W. Goodman. Wiley, New York; Chapman & Hall, London, 1959. 284 pp. $4.50.