tion and radiation effects (including somatic and genetic effects), the prevention and treatment of radiation injury, the methods and means of controlling radiation, and an elaboration on the use of radioactive isotopes in research, medicine, and industry. The presentation is nontechnical, clear, and concise. A glossary and selected references assist and stimulate further studies.

The book reflects the author's great experience; this experience, based on many personal contacts, discussions, conferences, and private studies, enables him to provide information in a logical and perfect form for those who must acquaint themselves with the effects of ionizing radiations on man. It is an eminently practical book.

A. T. KREBS
U.S. Army Medical Research Laboratory, and *Biology Department, University of Louisville*

Indian Scientific and Technical Publications. Exhibition 1960, a bibliography. Compiled by the National Library, Calcutta. Council of Scientific and Industrial Research, New Delhi, India, 1960. xii + 393 pp. Rs. 25.

This bibliography, which originated in an exhibition of Indian publications held at the National Library in Calcutta, covers books and periodicals in all the major scientific and technical areas, including certain characteristically Indian subjects, such as ayurveda and yoga and the sago and vanaspati industries. As one would expect in a country at India's stage of economic development, the emphasis in the compilation is on topics in the applied sciences and, in terms of type of materials, on handbooks and textbooks at the intermediate and college level.

The total number of entries is 4800. In Part 1, about 2900 entries represent 13 Indic languages (for example, Hindi, 800; Marathi, 360; Bengali, 350; Tamil, 270; Urdu, 180; Sanskrit, 120). Approximately 10 percent of the entries are translations. Among the subject fields, medicine leads with about 800 publications, followed by agriculture, 400; engineering, 220; physics, 190; general science, 180; astronomy, 150; and so forth. In Part 2, 1900 English titles are distributed among agriculture, 500; engineering, 320; medicine, 190; mathematics, chemical technology, and physics, about 100 each; the other fields of science and technology are represented by fewer than 100 titles each.

The bibliography is arranged according to the Dewey decimal system and has three voluminous indexes: an author-title index for each part and a combined subject index for both parts. A directory of the contributing Indian publishers rounds out the volume.

As the compilers themselves point out, the merits and shortcomings of this bibliography are inherent in the event that occasioned it. The fragmentary quality of the contributions submitted for the exhibition by the publishers of India is reflected in the compilation, despite attempts of the National Library to fill in the gaps (especially from its own Indic languages collection). The Library plans to correct this deficiency by publishing a supplement at an unspecified later date. A lesser fault is that the reader not familiar with the Indic languages is rather at a disadvantage in scanning Part 1, since no English translation or annotation of the transliterated (Hunterian system) titles is given.

Nevertheless, this is a major and up-to-date bibliography of scientific and technical monographs and serials issued in India. It is a useful adjunct to such bibliographic tools as the INSDOC and UNESCO bibliographies in this field and to the union list edited by Ranganathan. The great majority of the titles listed in this compilation have been published in the last decade; thus, readers are assured of timely and useful information on current developments in this area. The printing, the arrangement, the indexes, and the directory of Indian publishers attest to skill and care given to the preparation of this work.

T. W. MARTON
Library, National Bureau of Standards, Washington, D.C.

Gifford Pinchot: Forester-Politician. M. Nelson McGeary, Princeton University Press, Princeton, N.J., 1960. xii + 520 pp. $8.50.

To foresters the name of Gifford Pinchot means the man who, above all others, created the profession of forestry in the United States, the man who was instrumental in shaping the present system of national forests, and the man who made the U.S. Forest Service a model agency. To the conservationist, it was Pinchot who worked hand in hand with Theodore Roosevelt during the glory days of the movement. Pennsylvanians will recall Pinchot as a vigorous, effective, and honest governor who served the commonwealth for 8 years during the '20's and '30's, when vigor, skill, and honesty were far from commonplace in state administration.

This biography reviews Gifford Pinchot's life as a whole for the first time. It is a pleasure to report that Nelson McGeary, chairman of the department of political science at Pennsylvania State University, has given us a full, perceptive, and judicious account, of the sort that Pinchot was wholly incapable of writing.

Pinchot considered himself as having had two separable careers. He described his early work in forestry in the autobiographical *Breaking New Ground*; this career ended in 1910, after President Taft resolved the Ballinger-Pinchot controversy by firing Pinchot as forester. McGeary originally began the present study as a political biography of Pinchot's later years.

"Don't try any sly or foxy politics," Pinchot lectured forestry students at Yale: "A forester is not a politician." Pinchot's own life belied the distinction, at least for any forester in a position to influence public policy. McGeary found it essential to broaden the compass of his biography. The result is an illuminating study in which the several interests and activities in Pinchot's career are effectively interwoven.

Pinchot won two terms as governor despite a lack of certain political skills. Notably, he had neither talent nor taste for compromise. Yet he was by no means an unsuccessful practitioner in government, and his greatest strength in politics stemmed from an unflagging devotion to what he conceived to be the "greatest good of the greatest number in the long run." This happy phrase describes what led him to choose forestry for his profession. As a statement of the underlying objective of national forest management, Pinchot's words have become a cornerstone of public resource policy in the United States.

Pinchot was a skillful and effective administrator, drawing to the Forest

Service and later to the state government of Pennsylvania an able and dedicated corps of men. He was neither the sole creator of American forest policy nor the sole creator of the U.S. Forest Service. Yet 55 years after the Transfer Act that gave the Forest Service its present form, American forestry and the Forest Service still show his stamp. Pinchot excelled only as the chief executive of an organization. He had a chronic inability to work effectively with his peers in the Republican party and in the Progressive movement. To only one superior did Pinchot ever give the full measure of loyalty and devotion he inspired among his own subordinates, and that man was Theodore Roosevelt, with whom he enjoyed a special privileged status. This fact was largely responsible, in McGeary's judgment, for thwarting many of Pinchot's political efforts. Three times he tried unsuccessfully to win a seat in the Senate, and on other occasions he revealed almost painfully naive dreams of succeeding to the White House.

Pinchot's greatest weakness was a tendency to see issues, men, and motives in harsh black and white. He seldom doubted where Virtue took her stand. This cast of mind dimmed his perception of some ethical questions; it also left him blind to some of the plain realities of life, both in forestry and in politics. Thus, Pinchot remained a militant lifelong advocate of federal regulation of cutting practices on private forest lands, because, in his eyes, private forest management had not really changed during the three decades since he was The Forester. It was the same Gifford Pinchot who confided to his diary in May 1936 that Alfred M. Landon could be elected President that November "if I help him."

Pinchot was a prolific and candid letter writer. His voluminous correspondence was deposited in the Library of Congress shortly before his death. These letters, together with Pinchot's diary, are the major sources of this biography. McGeary has also made effective use of the extensive mass of published material dealing with Pinchot's life and times.

This biography, as McGeary expects, will probably satisfy neither the worshippers nor the detractors of Gifford Pinchot. By setting down a round, unvarnished tale of Pinchot's life, McGeary has succeeded in showing us "what kind of person he really was, what he was striving to accomplish, and what methods he used to attain his objectives." The reader is not likely to underestimate Gifford Pinchot's lasting achievements as a forester-politician.

HERBERT I. WINER
School of Forestry, Yale University

Operations Research and Systems Engineering. Charles D. Flagle, Jr., William H. Huggins, and Robert H. Roy. Johns Hopkins Press, Baltimore, Md., 1960. x + 889 pp. Illus. $14.50.

Although not explicitly advertised as such, this book is a collection of articles on the methods of operations research, written at an elementary level that is suitable for engineers and management personnel. There are introductory articles on the general philosophy and methodology of operations research and specific articles on such techniques as linear programming, queueing theory, theory of games, simulation studies, information theory, and other systems methods. Finally there is a collection of case studies. The chief defect in these articles is a tendency to verbosity on the part of some of the contributors.

By far the most fascinating and persuasive section is that on case studies. Of particular interest is an article by Zimmerman on the simulation of tactical war games; the discussion follows the course of a particular game step by step. Other articles detail studies on the operation of a hospital and a newspaper and analyze the cost and value of reports in a telephone company.

An article by Ellis Johnson (reprinted from the *Journal of Operations Research*) on operations research in the world crisis in science and technology goes far to illustrate the limitations of overenthusastic applications of operations research considerations.

This book contains little that is new, but it is a worthwhile addition to the bookshelf of management personnel and others not actively engaged in operations research work.

GEORGE WEISS
Institute for Fluid Dynamics and Applied Mathematics, University of Maryland

Miscellaneous Publications

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

U.S. Geological Survey. *Geological Survey Bulletin.* Bulletin No. 1058-E, "Geology and ore deposits of northwestern Chichagof Island, Alaska," Darwin L. Rossman, 1959, 80 pp. + maps; Bulletin No. 1061-F, "Glacial geology of the Mystic Lakes-Fresh Pond area, Massachusetts," Newton E. Chute, 1959, 31 pp. + map; Bulletin No. 1071-H, "Igneous and tectonic structures of the Stillwater complex, Montana," W. R. Jones, J. W. Peoples, and A. L. Howland, 1960. 63 pp. + map; Bulletin No. 1072-0, "Geology and oil-shale resources of Naval Oil-Shale Reserve No. 2, Uintah and Carbon counties, Utah," W. B. Cashion, 1959, 44 pp. + map; Bulletin No. 1074-F, "Geology and uranium occurrences in the Miller Hill area, Carbon County, Wyoming," James D. Vine and George E. Prichard, 1959, 41 pp. + map. *Geological Survey Professional Papers.* Paper 294-M, "Foraminifera of the Monterey shale and Puente formation, Santa Ana Mountains and San Juan Capistrano area, California," Patsy Beckstead Smith, 1960, 35 pp.; Paper 315-D, "Stratigraphy of Pennsylvanian and Lower Permian rocks in Brown and Coleman counties, Texas," D. Hoye Eargle, 1960, 25 pp. + maps; Paper 332, "Cretaceous and Tertiary formations of the Book Cliffs, Carbon, Emery, and Grand counties, Utah, and Garfield and Mesa counties, Colorado," D. Jerome Fisher, Charles E. Erdmann, and John B. Reeside, Jr., 1960. 84 pp. + maps; Paper 333, "The foraminiferal genus *Orbitolina* in North America," Raymond C. Douglass, 1960, 55 pp. + maps; Paper 334-C, "Trilobites of the Upper Cambrian, Dunderberg shale, Eureka district, Nevada," Allison R. Palmer, 59 pp.; Paper 334-D, "Late Paleozoic Gastropoda from northern Alaska," Ellis Y. Yochelson and J. Thomas Dutro, Jr., 1960, 40 pp.; Paper 351, "Mode of flow of Saskatchewan Glacier, Alberta, Canada," Mark F. Meier, 1960, 79 pp. + maps. U.S. Geological Survey, Washington, D.C. (order from Supt. of Documents, GPO, Washington 25).

University of California. *Bulletin of the California Insect Survey,* vol. 6, No. 4, "The siricid wood wasps of California (Hymenoptera: Symphyta)," Woodrow W. Middlekauff, 18 pp., $0.50; vol. 6, No. 5, "The soldier flies or Stratiomyidae of California," Maurice T. James, 54 pp., $1. *Publications in Botany,* vol. 30, No. 5, "Morphological aspects of parasitism in the dwarf mistletoes (*Arceuthobium*)," Job Kuijt, 100 pp., $2; vol. 32, No. 3, "A morphological study of three South African Gigartinales," Florence Ellen Hewitt, 40 pp., $0.75. *Publications in Entomology,* vol. 16, No. 5, "The feeding behavior of Hippodamia Quinquesignata (Kirby) larvae," Ibrahim K. Kaddou, 52 pp. *Publications in Geological Sciences,* vol. 34, No. 5, "Origin of Rock Creek and Owens River gorges, Mono County, California," William C. Putnam, 60 pp., $2. University of California Press, Berkeley, 1960.