

of the state budget is expended in any of the six states for research; this is hardly impressive. Third, scientific activity in the states reflects the traditional obsessions, notably the heavy emphasis on agricultural research and on applied research generally. Perhaps the states may be "chasing the wrong rabbits"; research on urban redevelopment, housing, and smog may be more urgent than the search for new varieties of rust-resistant wheat. Fourth, the talents of researchers at the state university are rarely mobilized to bear on the crucial problems of a state. New Mexico, for example, needs a major, long-range research program on arid lands. The fact, cited in this study, that New Mexico puts the highest percentage of money into this kind of research obscures the central truth—namely, that the research effort is weak, thin, and uncoordinated, and falls far short of the need.

As a free people we have been content for the most part with a *laissez faire* philosophy regarding science. Our ideal is the researcher left to his own devices, pursuing his own interests. Perhaps it may not be inappropriate to suggest that scientific manpower resources can be mobilized in the cause of freedom without sacrificing the essential freedoms of the investigator. Whether at the federal or the state level, it is plain that this is the great challenge to science and public policy in our time.

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**Mathematical Methods and Theory in Games, Programming, and Economics.** vol. 1, *Matrix Games, Programming, and Mathematical Economics*. x + 433 pp. vol. 2, *The Theory of Infinite Games*. xi + 386 pp. Samuel Karlin. Addison-Wesley, Reading, Mass., 1959. Illus. \$12.50 each.

Although there are several good books on game theory, none matches this set in completeness of exposition. These volumes present a thorough discussion of the essentially noncontroversial parts of the subject. Included in the first volume are a survey of discrete matrix games together with practical computational methods, the theory of linear programming, some results in nonlinear programming, and chapters

on applications to economics. The second volume is concerned with continuous games, including the several classes of readily solvable ones, and games of timing.

Karlin writes with a high degree of rigor that demands close attention from the reader; many fascinating problems are worked in detail. The price of these volumes can only be called breath-taking.

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**Plant Pathology.** Problems and progress, 1908–1958. C. S. Holton, G. W. Fischer, R. W. Fulton, Helen Hart, S. E. A. McCallan, Eds. University of Wisconsin Press, Madison, 1959. xix + 558 pp. Illus. \$8.50.

This book contains 51 papers that were presented at the 50th anniversary meeting of the American Phytopathological Society. The papers, prepared by well qualified foreign and American scientists, embrace most of the broad field of plant pathology.

The first seven papers were major addresses devoted to the history and development of the science of plant pathology and to the history and development of the society.

The other 44 papers are arranged in nine groups corresponding to the symposia at which they were presented: (i) physiology of parasitism; (ii) genetic approach to elucidation of mechanisms governing pathogenicity and disease resistance; (iii) fungicides; (iv) chemistry of fungicides; (v) soil microbiology and root disease fungi; (vi) concepts and problems of nematology; (vii) structure of viruses; (viii) multiplication of plant viruses; and (ix) epidemiology of plant diseases.

These well prepared papers give a comprehensive summary of the present state of knowledge of the various segments of plant pathology. They are well documented, and each one includes an extensive list of pertinent literature citations.

This book gives a well-balanced review of the past and present state of plant pathology, and it will be a valuable reference book for teachers, research workers, and students.

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## Reprints

*Adventuring with Beebe.* Selections from the writings of William Beebe. Viking Press, New York, 1960. 282 pp. \$1.25. The selections, covering more than 40 years and ranging from Bermuda to British Guiana and the Pearl Islands, deal with varied wildlife from black inchling fish to 35-foot whale sharks.

*Animal Camouflage.* Adolf Portmann. Translated by A. J. Pomerans. Univ. of Michigan Press, Ann Arbor, 1960 (*Tarnung im Tierreich*, Springer, Berlin, 1956). 111 pp. \$1.95.

*The Ants.* Wilhelm Goetsch. Translated by Ralph Manheim. Univ. of Michigan Press, Ann Arbor, 1960 (*Die Staaten der Ameisen*, Springer, Berlin, ed. 2, 1953). 173 pp. \$1.95.

*The Birds.* Oskar Heinroth and Katharina Heinroth. Translated by Michael Cullen. Univ. of Michigan Press, Ann Arbor, 1960 (*Aus Dem Leben Der Voegel*, Springer, Berlin, ed. 2, 1955). 181 pp. \$1.95.

*Caves of Adventure.* Haroun Tazieff. Translated from the French by Alan Hodge. Viking Press, New York, 1960. 222 pp. \$1.45. An account (originally published in 1953) of an expedition into the labyrinth of caves 2000 feet underground in the Pyrenees.

*The Chemical History of a Candle.* A course of lectures delivered before a juvenile audience at the Royal Institution. Michael Faraday. William Crookes, Ed. Viking Press, New York, 1960. 122 pp. \$0.95.

*Crucibles: The Story of Chemistry.* From ancient alchemy to nuclear fission. Bernard Jaffe. Fawcett Publications, Greenwich, Conn., 1960. 240 pp. \$0.50.

*Ebb and Flow.* The tides of earth, air, and water. Albert Defant. Translated by A. J. Pomerans. Univ. of Michigan Press, Ann Arbor, 1960 (*Ebbe und Fult des Meeres der Atmosphäre und der Endfeste*, Springer, Berlin, 1953). 121 pp. \$1.95.

*Engineers' Dreams.* Willy Ley. Viking Press, New York, 1960. 240 pp. \$1.25.

*The Foreseeable Future.* Sir George Thomson. Viking Press, New York, 1960. 166 pp. \$0.95. This book, written in 1955, deals with the future of technology.

*Light, Visible and Invisible.* Eduard Ruechardt. 201 pp. Translated by Frank Gaynor. Univ. of Michigan Press, Ann Arbor, 1960 (*Sichtbares und Unsichtbares Licht*, Springer, Berlin, ed. 2, 1952). 201 pp. \$1.95.

*Men of Medicine.* Katherine B. Shippen. Viking Press, New York, 1960. 220 pp. \$1.25.

*El Origen de las Especies por Medio de la Selecccion Natural.* vols. 1 and 2. Carlos Darwin. Estudio preliminar de Juan Comas. Universidad Nacional Autonoma de Mexico, Mexico, 1959. vol. 1, 276 pp.; vol. 2, 296 pp.

*Planet Earth.* Karl Stumpff. Translated by Egon Larsen and Frank Pickering. Univ. of Michigan Press, Ann Arbor, 1960 (*Die Erde als Planet*, Springer, Berlin, 1955). 191 pp. \$1.95.

*The Sun.* Translated by A. J. Pomerans. Univ. of Michigan Press, Ann Arbor, 1960 (*Die Sonne*, Springer, Berlin, 1957). 160 pp. \$1.95.