Book Reviews

Man Among the Stars. Wolfgang D. Müller. Translated from *Du wirst die Erde sehn als Stern.* Criterion, New York, 1957. 307 pp. Plates. $4.95.

This is an unusual book. To my knowledge, it is the first book to be almost wholly dedicated to a justification of man's plans for the conquest of space. In such a book some historical background is necessary, along with a survey of our present stages in research and development toward such a goal. This is given in concise descriptions of rocketry, the effects of war on development, the present satellite program, and future plans for space stations and space ships. The author implies that the present position of the intercontinental ballistic missile programs may hinder our development of space travel and believes that a straightforward program would be better.

The spread of man over the earth, the exploration of faraway lands, the opening up of the Americas and of our Far West are attributed to built-in drives common to most members of the human race. On this basis, the conquest of space is inevitable, barring a major catastrophe to mankind. Even hysteria, such as the reaction to Orson Welles' broadcast of a play based on H. G. Wells' *War of the Worlds,* in October 1938, and the present controversy over unidentified foreign objects, appears to be part of the same pattern of reaction to the exploration drive. Similar and analogous waves of hysteria appeared during the great Age of Exploration, several hundred years ago.

Careful discussions of the effects of the discovery of the telescope on men's minds and speculations regarding gravity, the possible existence of extraterrestrial beings, and the role of religion in the event that such beings should be found to exist are intelligently evaluated on our present level of development. The Roman Catholic groups are far ahead of the other religious organizations in anticipating extraterrestrial life forms and have speculated on their relationship to man and man's personal religious beliefs.

Müller sees the conquest of space as an opportunity for a new dedication of mankind similar to the dedication that arose during the religious drives, the Age of Exploration, and the Crusades.

"We need a new idea," he says, "which might open up such an opportunity, one that would appeal to all of humanity and that could transform our view of the world, an idea with such a good chance of realization that it will fire the human imagination" (page 299).

The spiritual effect on man of such an enterprise, the unlimited horizons, and, if intelligent beings are found, the sense that man is not alone in the universe might serve to unravel some of the conflicts in our age of confusion. It is proposed that such a venture might act prophylactically on man, enabling him to achieve a saner viewpoint on life, and that it could constitute an alternative to the "shock-therapy" or "racial-lobotomy" impact that a nuclear war would have on the survivors, if any, in achieveing racial sanity. Müller's implications bear consideration and may have merit.

THOMAS S. GARDNER
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Reading the Landscape. An Adventure in Ecology. May Theilgaard Watts. Macmillan, New York, 1957. x + 230 pp. Illus. $4.75.

An author, having selected this excellent and challenging title, might have followed either of two courses. The first would have been a statement of principles, shrewdly selected from geology, soil science, and ecology, that the traveler could see exemplified in his journeys. The other, more concrete, is here adopted. It amounts to making the reader a companion on field trips, pointing out specific situations, and showing how to interpret them.

While the 13 chapters deal with landscapes in areas ranging from the Smokies to the Rocky Mountains, interest centers chiefly around the western lake states—Indiana, Illinois, and Wisconsin. Here May Theilgaard Watts, naturalist at the Morton Arboretum in Lisle, Illinois, is completely at home, having had the advantage of training under the late Henry Cowles at Chicago.

It is natural, then, that she should emphasize the ecological communities which clothe the landscape, although the geological and climatic influences that shape it are by no means neglected. The net result is an attractive and usable volume, informally written and illustrated with pen sketches.

I was especially intrigued by two chapters, near the end of the book, which show how ecological analysis can be divertingly applied to simple situations. One of these is the reconstruction of the history of an abandoned schoolhouse; the other, of the effect of changing fashions on landscape design about an old homestead.

PAUL B. SEARS
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The Wonder of Snow. Corydon Bell. Hill and Wang, New York, 1957. xvi + 269 pp. Illus. $5.

The multifaceted crystals of winter's wonderland, the microscopic and macroscopic magic that forms a flurry of flakes or a "landscapeful" of snow to delight the eye of an artist, provide Corydon Bell with his subject matter. He roams the globe, from pole to pole, and the realms of poetry and prose, wherever snow is featured. He travels the blooming deserts, fruitful because of snow-fed rivers and canals, climbs to mountain crags where avalanches are massive parcels of concentrated energy, flies into and above the clouds where nature works her physical and chemical snow-wizardry, and visits scientific laboratories where meteorologists strive to understand and duplicate earth's atmospheric snow machine.

For all its wide coverage, the book reads well and provides the inquisitive mind with much food for thought. There is evidence that snow has been falling somewhere on earth for much, much longer than men have inhabited this planet. In fact, man probably owes much of his vigor and aggressiveness in organizing the world to serve his needs to the nipping cold and biting wind that accompany winter pageantry. Yet the study of snow in a scientific manner is of comparatively recent origin.

Meteorology as a science, with a background of sufficient data to improve on the old farmer's prognostications, is only some 75 years old at most. (And when the weatherman is wrong, some folks say the science "hasn't been born yet.") Only since 1954 has Ukichiro Nakaya's monumental work *Snow Crystals* been available, with its classification of the crystals into seven basic types and information about how these types originate.

Corydon Bell has selected a well-bal-

anced collection of photographs and drawings to illustrate this book, including some from the work of farmer-photographer Wilson Bentley of Vermont, whose photomicrographs of snow and frost were collected over a period of 40 years before Nakaya. Through his acknowledgments and a good index, it is apparent that he has drawn upon a wide knowledge and familiarity with snow-lore and snow-science. He makes room for the Abominable Snowman and Alfred Wegener, Homer and Chaucer, Olaus Magnus and Vincent Schaefer, Byrd and Hobbs, "Snowshoe" Thompson and Langmuir.

This is by no means a textbook or even a technical book, though it treats of a subject that has a technical side. From the very first chapter one knows that the author loves winter and the snow, and before bumping up against the glossary, the average reader will also have an appreciation of what scientists have accomplished in finding out how, when, where, and why it snows, and of the men (other than Bell) who have left "footprints in the snows of time" for those who would follow. *The Wonder of Snow* belongs on every high-school science reference shelf and will make a splendid gift for youngsters and oldsters alike who have a fondness for nature and out-of-doors—and snowflakes.

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H. A. Lorentz, Impressions of His Life and Work. G. L. de Haas-Lorentz, Ed. North-Holland, Amsterdam, 1957. 172 pp. + plates. $3.

The purpose of this volume is to give an impression of one of the greatest physicists of the first quarter of our century.

Most of the book is taken up by the very personal reminiscences of Lorentz's eldest daughter, herself a physicist and the wife of a physicist. Interspersed between these reminiscences are contributions by friends and pupils. Fokker gives a semipopular account of Lorentz's *oeuvre,* Van der Pol assesses the importance of Lorentz's work in the field of modern telecommunication, Thysse tells the fascinating story of how Lorentz calculated the influence of the proposed reclamation of most of the Zuyder Zee on the behavior of the tides in the remainder, and Casimir discusses the influence of Lorentz's ideas on modern physics.

One is left with a very definite picture of the man and physicist Lorentz, not least through the short contributions by Einstein (especially written for this volume) and Ehrenfest (a translation of his speech at Lorentz's funeral). Anybody interested in the history of science and in scientists as human beings will read this volume with great profit.

D. TER HAAR
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Electricity and Magnetism. B. I. Bleaney and B. Bleaney. Clarendon Press, Oxford, England, 1957 (order from Oxford University Press, New York). xiv + 676 pp. Illus. $10.10.

Here is just the book for a scientist who cultivates another field to have on his shelf for easy reference. The authors, B. I. and B. Bleaney, both lecturers in physics, at different colleges of Oxford University, hope to fill "the need for an up-to-date text on *Electricity and Magnetism* which would cover the whole field, both the theory and the practice," for their undergraduate students, and a few "chapters have been included which may form part of a graduate course."

They use the word *comprehensive,* which is surely no overstatement, for after eight chapters on "fundamentals at an elementary level," they romp through chapters on alternating-current theory; electromagnetic waves (including filters, transmission lines, and waveguides); electromagnetic machinery; thermionic vacuum tubes (three chapters, and it must be these they had in mind when they spoke of "practice"); and alternating-current measurements. After these come the chapters that I suppose are suitable for a graduate course: theory of the dielectric constant; theory of conduction in the solid state; the atomic theories of paramagnetism, ferromagnetism, and antiferromagnetism; and magnetic resonance. There is a final chapter on units, and I am happy to see that the authors use the rationalized metre-kilogram-second system throughout the book.

It is hardly necessary to remark that a book with this coverage, even a book of nearly 700 pages, can never be profound. But it is surprising how thorough the book can be and still remain readable and easy to follow. This argues careful planning and elimination of nonessentials. I find that when I read in unfamiliar fields, the book is interesting and informative; when I read in fields that I know well, it is clear and accurate.

Definitely this is a book to be taken down off the shelf when some information is wanted on, say, contact potentials or nuclear magnetic resonance. You will find a brief and illuminating section on either. This may be enough, but it may very well be that you will then want to read further in more detailed treatises. This is where Bleaney and Bleaney fail us, for they have missed the opportunity to give lists of references for the inquiring reader. Perhaps in some future edition . . .

You should not approach this book without a previous knowledge of general physics, such as most American colleges give to freshmen. In mathematics, the language of calculus is supposed to be familiar. Vector analysis is used, with a notation nearly enough like the common style to keep one from feeling much annoyance on this score; the appendix is adequate for purposes of review rather than of learning.

The exposition is clear and straightforward. The style is simple, but it has an elegance that we have come to expect of the English universities. *Electricity and Magnetism* is pleasant reading and, in brief, is a book I shall be glad to have for my own frequent use.

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Modern Mathematics for the Engineer. Edwin F. Beckenbach, Ed. McGraw-Hill, New York, 1956. xx + 514 pp. Illus. $7.50.

The Department of Engineering at the University of California has organized a series of lecture courses in modern physics, mathematics, and chemistry. The objective was to acquaint engineers with some late scientific discoveries and to stimulate their application in engineering.

The first set of these lectures—those on physics—was published a few years ago and contained an authoritative, broad, and largely nontechnical presentation of a large part of modern physics, with very little use of the mathematical formalism. The present volume, covering the lecture course on mathematics, has a quite different character. It covers topics which can be treated by differential and integral equations, probability and game theory, and computational methods—topics which form a smaller, though fundamental, part of modern mathematics.

The book contains an "Introduction" (Weller) and is divided into three parts. The first part is called "Mathematical Models." There are chapters on oscillations (Lefschetz), stability theory (Bellman), calculus of variations (Hestenes), and hyperbolic (Courant) and elliptic (Schiffer) partial differential equations. Two chapters are on applications: exterior ballistics (Green) and elastostatics (Sokolnikoff). Obviously these applications were selected because the lecturers happened to be specialists in these topics.