there must be no other existing society that can cover the whole of the same ground equally well. On the second issue the new society can claim general support. The scientific attack on nutrition is, indeed, made from many directions—by medical practitioners, biochemists and physiologists, agriculturists and veterinarians, dietitians and sociologists, economists, statisticians, food technologists and probably others. In the specialized organizations to which these various experts belong questions of nutrition will be discussed with less or greater frequency. Indeed, in medical organization the attention given to dietary factors is certainly still on the increase. But even here, and in the excellent meetings arranged through its Nutrition Panel by the Food Group of the Society of Chemical Industry, it is obvious that there is a lack of integration. At the medical gathering the biochemist and laboratory worker are likely to be in the background, the agronomist and the practical dietitian probably entirely absent; at the Food Group meetings medical views are unlikely to be represented, and veterinarians are probably as invisible as statisticians. If the new society can bring together all the contributors to our growing knowledge of the relationship between food and health it will certainly achieve something not yet achieved—primarily, perhaps, because it has never been attempted, at all events in this country. And it has so far not been attempted because the importance of the subject is still too little appreciated in many of the most influential circles. It is doubtful if the emphasis given to-day to problems of feeding the community would have been nearly as marked but for the exigencies of wartime. In this sense, but we are sure in no other, the Nutrition Society may possibly be considered a child of Hitler. There can be little doubt to-day—least of all in the minds of medical practitioners—that nutrition has become a subject with "content." For the investigations of nutritional problems, special and other new techniques have been increasingly needed; for the discussion of problems and techniques alike a new organization has been found necessary.

That there are many gaps—some of them enormous—in our knowledge of human and animal nutrition would not be denied by the most craft-conscious nutritional scientist. The meetings or conferences to be organized by the new society—if one may judge by the proposed Cambridge meeting on "The Evaluation of Nutritional Status"—are just of the type calculated to reveal these gaps and therefore to point to ways of closing them. In that sense, if in no other, the foundation of the Nutrition Society may legitimately be regarded as a contribution to the national war effort, for it can not fail to give support to all those forces that, by stimulating investigation and helping to disseminate its results, make for improvements in the dietary of the people as a whole and therefore in their health, their vigor and their democratic independence.—*The British Medical Journal.*

SCIENTIFIC BOOKS

THE HARVARD BOOKS ON ASTRONOMY

TWENTY years ago Harlow Shapley became the director of the Harvard College Observatory. A young man himself (then only 36), he chose other young men to work with him. As director he elected to delegate to the younger men responsibility for plans as well as for execution of the plans. He encouraged them to undertake research and found the money to support their projects. As the years have passed, he has brought to Harvard Observatory that air of critical, original thought, that intellectual ferment that can perhaps best be described as an "atmosphere of research."

Realizing the need for a series of modern authoritative books on the various fields of astronomy which might be read by laymen, beginning students and amateur astronomers, he set his men to work. Nine books were planned, and fourteen authors have been writing them. In each case, the authors were chosen because of their competence in the particular field. Serving as editors are Dr. Shapley and one of his young men, Dr. Bart J. Bok; this may be taken as a guarantee of the quality of the books. The Blakiston Company of Philadelphia is publishing the series.

The first four books of the series have appeared. If the later volumes maintain the high standard set by these four, the series will be an outstanding success. The volumes at hand are attractively bound in a red water-resisting material. Each has 200 or more pages of clear easily read print and excellent illustrations. Especially to be commended is the generous use of photographs of astronomers, past and present, each picture appearing near the point at which the man's work is mentioned in the text.

The progress of astronomy is so rapid that it is difficult to publish a book that is truly up-to-date. These volumes are! Furthermore, they are inexpensive and readable; they may be read with pleasure and profit by any person with a high-school education.

The Milky Way. By BART J. BOK and PRISCILLA F. BOK. 204 pp. 96 illustrations. Philadelphia: The Blakiston Company. 1941. $2.50.

This book presents clearly an excellent summary of our present knowledge of the Milky Way and explains how that information was gathered. It also points out some of the problems which remain to be solved. It explains how the astronomer interprets his star-counts and why international cooperation in the field is so important. The book is a very readable one, one interesting idea leading directly to another. As evidence that the book is up-to-date, mention might be made of the automatic star-counter of McCuskey and Scott, and the use as illustrations, of photographs taken with Schmidt cameras.

The reader may be misled by the modesty of the authors; the name, Bok, does not appear in the index and the personal pronouns, first person, seldom appear in the text. Their contributions to the field are mentioned but without credit to them or to Harvard Observatory. There should be some way of informing the reader that the Doctors Bok are authorities in the field in which they write. This comment applies also to the other three books reviewed here.

One can get a glimpse of the authors in their choice of words; colorful phrases, such as "Siberian wastes of intergalactic space," "ectoplasmic glow" and "leaking quantum" appear occasionally. Some persons will criticize the book because the term, "light year," is used on page 17 and defined on page 31; because "proper motion" is used on page 38 and explained on page 65. However, a second reading, which the book well deserves, will take care of such small difficulties. After reading on page 40, ". . . since light is a wave-motion . . ."; on page 112 of "light quanta" and on page 131 of a "qantum of wave length 3933, Angstroms," the reader may feel that the authors should have said specifically that astronomers are unable to choose between the wave theory and the quantum theory of light.

There is an index at the end of the book which is generally satisfactory. It may be noted that the important word, "parallax," does not appear there; under "stellar," one finds several kinds of parallax listed but not the basic "trigonometric parallax." In a small pocket in the back, there are two excellent composite photographic maps of the Milky Way, Northern and Southern, which may be removed for examination.

Between the Planets. By FLETCHER G. WATSON. 222 pp. 106 illustrations. Philadelphia: The Blakiston Company. 1941. $2.50.

This volume covers the asteroids, comets, meteors and meteorites and discusses briefly the zodiacal light and the Gegenschein. It is natural for an author to emphasize those things in which he is particularly interested; approximately one fifth of this book is about asteroids, one fifth about comets and three fifths about meteors and meteorites. It should appeal especially to statistically minded persons, for there are many graphs, scatter diagrams and tables. To be specific, there are about thirty tables, fifty charts, graphs and diagrams and sixty photographs or pictures.

Mathematicians will be critical of some of the statements appearing in the book, as, for example, on page 4, "Elliptical orbits can be of all shapes and sizes," and on page 6, "If it moves faster, the orbit is a hyperbola having an eccentricity larger than one and, according to the mathematicians, a period greater than infinity. . . ." Elliptical orbits are always closed curves and except for limiting cases, oval in shape; the mathematician's definition of "infinity" does not allow anything to be "greater than infinity." On page 53, the author uses the phrase, "moderately circular" and in the legend of Figure 40, page 72, "extremely circular." Circularity is somewhat like perfection; it is not subject to qualification.

One wonders why, after using good American phrases throughout the book, the author should choose to use "million million million" instead of "quintillion" or, if necessary, "American quintillion." The reader will be aware that the proofreading was poor. If the author had had an opportunity to correct a second proof, the book would have been improved. Fortunately, there are few places where scientific accuracy of statement is endangered by typographical errors.

When the reviewer was in college, he was not allowed to write two complete sentences and separate them merely by a comma. The author allows himself this privilege frequently. Investigation reveals that some of the most recent text-books on English allow such "run-on" sentences. Thus the English, as well as the information in this book, is the very latest.

After these critical comments, it may be wise to say again that the book will be interesting to any one wanting to know more about asteroids, comets, meteors and meteorites.

The Story of Variable Stars. By LEON CAMPBELL and LUIGI JACCHIA. 226 pp. 82 illustrations. Philadelphia: The Blakiston Company. 1941. $2.50.

This volume covers well the field of variable stars—discovery, observation and theory; short-period, long-period and irregular variables, novae and eclipsing

binaries. It is well written and reflects the authors' enthusiasm for their subject as well as their knowledge of it. The senior author has been a guiding light of the American Association of Variable Star Observers for many years. One may confidently predict that every member of this organization will want a copy of the book, as will other amateurs who are looking for observational work to do.

The authors stay close to the subject in hand, though on page 98, one is reminded of the difficulty of throwing a twelve with a pair of dice and on page 113, Samson and Delilah are introduced. It is pleasant to find specific figures given, as for example, the shortest and longest periods known for a given type of variable star. One is encouraged to learn on page 131 that it is improbable that our sun will explode, a possibility to which too much space has been given in our newspapers.

For a horizontal inflexion point, the authors use the word "still-stand," presumably because there is no better English word for it. They might have used the initial letters of "horizontal inflexion point," thereby giving a new and descriptive use to an old word. The characteristic curve of a photographic emulsion has a "toe" and a "shoulder"; why shouldn't an occasional light-curve of a variable star have "hips"?

At the end of the book are given the following tables: Names of the constellations and their abbreviations; Table for conversion of decimal of a day to hours and minutes; Julian Day Table 1940–1950; Twenty interesting variable stars; Fourteen interesting Novae.

Earth, Moon and Planets. By FRED L. WHIPPLE. 293 pp. 140 illustrations. Philadelphia: Blakiston Company. 1941. $2.50.

This lucid book has a freshness which is amazing when one considers the large number of books which have been written about the solar system. The field covered is adequately described by the title. One finds the true spirit of science in the impersonal manner in which the evidence bearing on a given theory is evaluated and in the breadth of mind reflected in the phrasing of conclusions drawn from that evidence.

Every chapter in the book is interesting, but the discussions of "The Earth as an Abode of Life" and of Mars are of especial interest. In contrast to the other three books reviewed above, metric units are not used, nor is temperature given on the Centigrade scale. The average American reader will find miles and degrees Fahrenheit easier to understand than kilometers and degrees Centigrade. One can read this book with pleasure and understanding, even though one has no scientific background.

Some readers will dislike the use of many footnotes; the presence of a dagger or an asterisk at the end of a sentence does interrupt the smooth continuity of a paragraph. Others may take exception to the spelling of some words, such as "clews" and "crape," and to the use of "island universe" for a spiral nebula. Those making the latter criticism will insist that though "island universe" has been widely used, by definition there is only one universe and it includes the spiral nebulae.

In a small pocket in the back of the book, there is a good star-map covering the region of the sky within 65 degrees of the celestial equator. This is convenient, since one does not need to take the whole book out into the garden when one wishes to study the stars. No maps are given for the regions near the celestial poles. One unusually valuable feature of this book is the Planet Finder, with which one can determine the approximate locations in the sky of the Sun, Mercury, Venus, Mars, Jupiter and Saturn at any time between 1940 and 1970, inclusive.

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CALCULUS OF EXTENSION

The Calculus of Extension. By HENRY GEORGE FORDER. xvi + 490 pp. Cambridge: At the University Press. New York: The Macmillan Company. 1941. $6.75.

THIS book gives an account of the use of Grassmann's Calculus of Extension in geometry. The abstract algebra, which is The Calculus of Extension, is developed postulationally and is applied in a variety of geometric situations.

The treatment advances from the special to the more general. Chapter I is devoted to "Plane Geometry," and Chapter II to "Geometry in Space." Chapter III is concerned with "Applications to Projective Geometry," and "The General Theory" begins with Chapter VII. In all there are fifteen chapters, treating among others such further topics as "Rotors in Space, the Screw, and the Linear Complex" in Chapter IV, "Circles" in Chapter XI, and "Transformations and Square Matrices with Applications to Central Quadrics" in Chapter IX.

Much of the material included is classic. However, a characteristic of this work which is due to the author is the emphasis on identities. His aim is "to express geometric theorems as identities, involving not coordinates but the geometric entities themselves which appear in the theorems."

The author is professor of mathematics in University College, Auckland, New Zealand. He comments in the Preface upon the unfavorableness of his environment to scholarly endeavor, noting particularly