# Book Reviews

**The World of Mathematics.** A small library of the literature of mathematics from A'h-mose the Scribe to Albert Einstein, presented with commentaries and notes by James R. Newman. vols. 1–4. 2535 pp. Illus. $20.

*The World of Mathematics* is an anthology which reflects the diversity, utility, and beauty of mathematics and makes clear the wealth of its ideas. This anthology also reveals that mathematics can be an object of satire, a subject for humor, and a spur to wit. These and other appropriate phrases are used by the author in the introduction, which describes his achievement, after 15 years of gathering and selecting materials. Our gratitude should go to the author and publisher for the timeliness of this scholarly work and for their wisdom in allowing it to include four volumes and more than 2500 pages. The subtitle is in no sense too bold a claim, and there is great value in the commentaries of the author which provide the setting of the separate selections, indication of how they came to be written, their place in the development of mathematics and, in most instances, biographic sketches of the authors.

Even though the selections must necessarily reveal the bias of the author—this is true of any anthology—the scope of the work is great enough to prevent serious injustice to any of the many facets of our rich heritage of mathematics. My enthusiasm for the library may be due, in part, to the fact that I share many of the biases of the author, especially in the attention given to geometry and probability. A number of the great writings of mathematics are given completely, and those from which excerpts have been taken include enough of the original to provide the reader with a fair taste of the idea of the writer. As is so often the case, a selection from a manuscript appears to have a different meaning out of context, when it is read in an anthology. Because of the length of the excerpts, and because of the commentaries and notes introducing them, this disadvantage has been reduced to a minimum. While some omissions may be regretted, and substitutions preferred according to mathematical taste, the breadth of selections seems to guarantee that these disappointments will also be at a minimum.

The wide diversity in history and topic of the selections can be recognized from a list of the mathematical greats whose works find a place in this library. The list includes such names as Archimedes, Bernoulli, Clifford, Dedekind, Descartes, Euler, Galileo, Laplace, Newton, Poincaré, and Sylvester. Among contemporary scholars, represented are Bell, Courant, Heisenberg, Kline, Menger, Russell, Schrödinger, von Neumann, and Wilder. Mathematicians and others will also enjoy the contributions from Lewis Carroll, Aldous Huxley, John Maynard Keynes, and George Bernard Shaw. As further indication of the scope of the work, I find satisfaction from the inclusion of such items as *The Declaration of the Profit of Arithmeticke* by Robert Recorde and *Counting* by L. L. Conant. To add to the value of the work as biography, Turnbull's *The Great Mathematicians* is given in full, as are a number of chapters from Bell's *Men of Mathematics*. Stephen Leacock's delightful essay on *Mathematics for Golfers* may be of significance in recording the timeliness of the anthology.

Among the selections that will be of interest to persons not claiming special mathematical competence are those items related to artistic expression. Here the reference is to the somewhat vague principle (as, for example, in the case of symmetry) and its interpretation through application and from a philosophical, as well as a mathematical, basis. In this category are included two of the penetrating essays of Hermann Weyl on *Symmetry*, with numerous illustrations that were included in the original manuscript. Other titles in this category are *Mathematics as an Art* by J. W. N. Sullivan; *Mathematics of Aesthetics* by G. D. Birkhoff; *Mathematics of Music* by Sir James Jeans. It is worth noting that Birkhoff, one of the leading mathematicians of the 20th century, in addition to his contributions to point-set theory, study of $n$-dimensional space, and mathematical physics, attempted to create a "general mathematical theory of fine arts." The two Birkhoff excerpts provide very interesting reading, although to some they may not be at all convincing.

Newman's small library of the literature of mathematics may become a landmark in the current effort to improve the teaching of science and mathematics. It should be a part of the personal library of all secondary-school and college teachers of mathematics and can very appropriately be placed in high-school and college libraries. Scientists and nonscientists will find pleasure and profit from reading many of the selections. It is not too much to hope that this anthology could contribute materially to the establishment of a more proper place for mathematics in our culture. Every college graduate should have read *Mathematics of a Lady Tasting Tea* by Fisher; *How to Solve It* by Polya; *Assorted Paradoxes* by DeMorgan; *Common Sense and the Universe* by Leacock; and *Mathematics as an Element of the History of Thought* by Whitehead. These and a great many other bits of liberal education in the broad sense are to be found in *The World of Mathematics*.

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**The Nature of Brucellosis.** Wesley W. Spink. University of Minnesota Press, Minneapolis, 1956. 464 pp. Illus. $8.

This is an excellent book on an absorbing subject by an internationally recognized expert who writes well. Spink has centered his professional activities in a region where brucellosis has been prevalent, and he has derived knowledge from his extensive experience. This he shares with great skill and imagination.

Spink has written a good review of the book in his preface, and one is tempted to quote it in full. He graciously reveals his awareness of what makes research projects (and monographs) succeed—the help of cooperative colleagues, the support of institutions and organizations, favorable circumstances, dedication, hard work, and good facilities. He states the nature and purpose of the volume and describes his qualifications to write it. He is a professor of medicine who is also a research worker, and he brings a great deal to this subject.

"This monograph is the biography of a disease and the autobiography of a laboratory and clinic devoted to a study of that disease. . . . The primary purpose of this publication is to present an overall picture of the complex nature of brucellosis in animals and in man."

Because he describes a disease that is

familiar to him as a biological phenomenon, the disease can be seen in good perspective. He synthesizes for the reader the concept of brucellosis as a "universal" from which the particular clinical variant can be understood and possibly predicted. The clinician will certainly find what he should know.

The book is taken up with the history, the organism, the reservoirs, the spread, and the epidemiology and then with the pathogenesis, natural course, complications, diagnosis, treatment, prevention, and outlook; 906 references are given, and the content of the articles is dealt with critically. He has supported the general clinical descriptions with the protocols of 244 cases.

One form of the infection may have been underemphasized—the one not characterized by abortion; it is prevalent in goats in the Mediterranean area. Since the Soviet reports on human immunization are only just now being made available, it is not surprising to find them unmentioned.

One hopes that the book will be as widely distributed as the disease.

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**Chazyan and Related Brachiopods.** pt. 1, Text pt. 2, Plates. Smithsonian Miscellaneous Collections, vol. 127. G. Arthur Cooper. Smithsonian Institution, Washington, 1956. 1024 pp. + 241 pp. + 269 plates. $20.

This monograph represents the culmination of study in the field and laboratory over a period of some 20 years. It is essentially a sequel to an earlier monograph by Ulrich and Cooper on brachiopods in the subjacent Canadian and Ozarkian rocks. The complex nature of the Chazy and related rocks is well recognized by Ordovician stratigraphers, and the appearance of this long anticipated monograph is of significance to a better understanding of middle Ordovician correlations.

The largest part of the material was collected by Cooper, although he did not visit all the regions from which Chazy and related rocks were taken. In addition, much of the material represents gifts or loans from other collectors whose accuracy for formational designations must be accepted. The list of formations, arranged alphabetically, covers most of the Chazy and related formations and is the most comprehensive to date. These formations cover the principal regions of Chazy rock exposures. Brachiopod faunal lists accompany each formation. Where faunal lists of other workers are listed under certain formations, identifications considered questionable are so indicated. Details concerning lithology, contact relationships, age, correlation, thickness, type sections, and status of the formations are discussed.

Special consideration is given to Appalachian stratigraphy, where emphasis is placed on the interlocking type of facies development as opposed to barrier-type control. Some opposition to this is anticipated on the part of workers who accept and in cases have illustrated reasonable evidence for both types of phenomena. A restored section north-south across the structural belts in Tennessee is illustrated to show the middle Ordovician facies concept.

In Section II, annotated lists of genera and species summarize concisely the stratigraphic distribution, geographic distribution, and pertinent remarks concerning each described form. Page references for generic and specific descriptions are very helpful. A correlation chart shows the position of the formations and members from which brachiopods are mentioned, described, or illustrated in more than 60 areas throughout the country and into Canada. The units are tied in with the middle Ordovician standard proposed by Kay and into five newly proposed stages. These stages, in ascending order, the Whiterock, Marmor, Ashby, Porterfield, and Wilderness, comprise essentially a newly offered standard section which was believed necessary to define correctly the stratigraphy and the natural grouping of faunas, mostly brachiopods. It was recognized that correlations—as in the correlation chart—based on one group of animals seldom if ever give the true picture, for the forms might be retarded or advanced. However, the correlation chart represents a good basis for comparative faunal studies using additional groups of animals.

Some of the correlations differ noticeably from those of previous workers. The work has resulted in many new formational designations, largely in the southern Appalachians where most of the field work was done. There are several departures from the present standard section: (i) the Beekmantown, typically subjacent to the Chazy, is separated by a new stage (Whiterock); (ii) such stage terms as Chazy and Black River are no longer considered usable; (iii) the stage name Hatterian, typically subjacent to Hunterian, is considered equivalent when Cooper's correlations are compared with earlier correlations of the afore-mentioned names; (iv) the new stage Wilderness would include correlatives considered as both Black River and lower Trenton (Rockland) in earlier works. Thus, the new stage boundary does not coincide with those in the existing standard section, and it would restrict the Trenton; (v) typical Chazy would be subdivided into the Marmor and Ashby stages.

The faunal descriptions cover more than 1070 species from more than 150 genera. Of these, nearly 80 represent new genera and nearly 600 new species, indicating the comprehensiveness of this study and at the same time pointing to the paucity of brachiopod studies in Chazy and related rocks heretofore. In addition to detailed descriptions on the morphology, type specimens, locality, and geologic horizon, a discussion of each species gives the salient characteristics by which it may be distinguished from others. Part 2 consists of 269 plates. They indicate the degree of mastery developed by the author in the preparation and illustration of brachiopod forms.

This monograph represents a singularly significant contribution to middle Ordovician stratigraphy and at the same time offers a challenge to other workers who may base their work on other groups of animals, and to those who may find evidence based on physical and structural criteria or who may have differing basic concepts of facies development.

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**Observations on Krebiozen in the Management of Cancer.** A. C. Ivy, John F. Pick, and W. F. P. Phillips. Regnery, Chicago, 1956. 88 pp. + tables and plates. $2.50.

The book *Observations on Krebiozen in the Management of Cancer* by A. C. Ivy, J. F. Pick, and W. F. P. Phillips purports to advance evidence in support of the senior author's claims made some years ago concerning a material alleged to be useful in treating cancer. The conclusions, which are based on reports of treated patients, are that the substance used, which has never been clearly defined, has brought about some improvement in a substantial proportion of the patients treated. The authors state that the improvement effected has occurred independently of other forms of treatment and too frequently to be considered examples of the well-known tendency of cancer to improve temporarily without any treatment. These claims are made for 4 percent of 189 patients.

The alleged material to which the term *Krebiozen* is applied is described as being made from the blood serum of horses that have been treated with a particular strain of microorganism. The method of preparation is not given in sufficient detail to permit it to be repeated