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BOOK REVIEWS

A MANUAL OF NEW MINERAL NAMES, 1892–1978. By Peter G. Embrey and John P. Fuller (1980). Copublished by the British Museum (N. H.) and the Oxford University Press, Oxford, England, and New York, New York. Hardbound, 467 pages, $49.50.

This magnificent volume is an alphabetical compilation of new mineral names which have been published since 1892. The entries are taken from the *Lists of New Mineral Names* which have been published in Mineralogical Magazine on thirty occasions since 1897. The entries are essentially short abstracts, containing formulae, cell dimensions, physical and optical characteristics, provenance and the derivation of the name. The abstracted entries are not taken verbatim, but have been corrected where needed and, most importantly, have been annotated with careful references to new studies, discreditations, and additional references to related species or relevant studies. The alphabetical organization of the work is extremely useful and will facilitate its frequent use. One has the impression that this book was compiled with extreme attention to accuracy and, more so than similar compilations, with an intent to make it very comprehensive.

The exhaustive and comprehensive nature of this work is undoubtedly its greatest asset. Not only well-respected and valid mineral species are included, but all mineral names published since 1892 are included. This is what separates this compilation from others which frequently include only those species the author considers valid. The present work includes valid and invalid and questionable and truly superfluous names, comments upon them in an objective manner, and does so without prejudice. The cumulative product is a thorough, very useful book in which one can find any mineral name published in the inclusive years, and obtain ready reference to original descriptions and relevant studies. The inclusion of the names of questionable species flows from the philosophy of the editors, who state in the foreword:

> "It is a prime purpose of a work such as the present one to keep these 'twilight' minerals alive until such time as they be fully reinstated or decently buried".

The inclusion of an author index is likewise useful, especially so for those awkward instances when one may not recall a mineral name but does know who described it. The author index lists, under each author's name, the species they have described or the names they have published.

This book will be a very useful and essential part of the library of every mineralogist concerned with more than rock-forming common minerals described in yesteryears. For the curator and those who frequently must cope with obscure names, it will be absolutely essential. This is a scholarly effort; it would be difficult to suggest improvements.

The volume is hardbound, lies flat when opened and, although not printed on fully-opaque white paper, has very little visible print-through interference. The use of bold-face type for species considered valid is very useful and the type size and style, together with the effective and neat layout of the entries, makes it an easily read book. I think the minimal margins are regrettable, inasmuch as personal copies of this work will need marking-up over the years and there is little room for this sort of annotation except for a short blank section at the end of most alphabetical sections. However, the very high cost of British printing likely required some needed parsimony in typesetting to keep the price of the book down. At $49.50 it is not overpriced for a long-term, very useful contribution to the science of mineralogy. It is superb.

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PLANETARY GEOLOGY. By John Guest, with Paul Butterworth, John Murray, and William O'Donnell. Halsted Press (John Wiley & Sons) New York, 1979. 208 pages, 94 b&w photos. $19.95 hardcover.

This is a beautiful book that will delight a much wider audience than just planetary geologists. It is not a textbook; it is an exciting guided tour through the terrestrial planets, as they have been revealed in the last decade by astronauts and robot spacecraft. The aim of the book, and it succeeds, is to tell people in words and pictures what the new discipline of "comparative planetology" is all about.

The 94 photos, carefully selected by the authors from the hundreds of thousands now available, span the brief and busy history of planetary exploration, from early pre-Apollo views of the Moon to Voyager 1's recent breathtaking views of the moons of Jupiter. The pictures include the entire menagerie of extraterrestrial geological structures—craters, lava flows, scarps, rifts, volcanoes ringed basins, icecaps, layered sediments, wind streaks, channels, and a lot of mysterious features that are still not understood.

The book's short introduction reviews space exploration and discusses how we go about comparing planets to each other. But the book's major value is in the "text" that follows—detailed, clearly-written captions of about 500 words for each picture. The captions are really short essays; they describe the observed features and then discuss the geological conclusions that have been drawn from them. In addition, the captions are long enough to include brief discussions of major planetary problems—the impact-or-volcanic origin of craters (pp. 16–20), lava tube and channel formation (p. 48), or why Phobos seems to be a captured asteroid (p. 192). The captions also emphasize comparisons of the same features—craters, volcanoes, basins, channels—as they appear on different planetary surfaces. (Volcanologists and volcano buffs will find the collection of the solar system's volcanoes especially exciting.)

The descriptions follow a clear path from the observed features to the geological conclusions, so that the reader, especially a student or nonscientist, can follow the planetary geologist as he moves—and sometimes leaps—from data to conclusions. The reader can thus appreciate directly the familiar problems of uncertain assumptions, insufficient data, and utterly inexplicable things that sometimes show up (such as the features on pp. 165 and 177).

This is a good format for the general reader, but it makes some of the interesting technical details hard to find. For example, the description of the lunar interior is part of the caption for "Hadley Rille" (p. 50), and the crustal history of Mars is filed under "Mars—Graben" (p. 140). A more complete index would have been helpful here; as it is, place names dominate over subject headings.

The book is beautifully produced. The pictures are clear and sharp. The text is attractively set and readable; it has apparently been meticulously checked for details and typos. There are a few minor problems, none of which mars the enjoyment or blocks the flow of information. A few of the figures should have had more visible call-ins to indicate specific features mentioned in the text, (*e.g.*, the Martian canyons (pp. 146–148) and the Mercury scarps (p. 70), and a few readers will probably have the same trouble I did with reversed relief in a few of the pictures. The discussion of unmanned lunar exploration (p. 18) should have also included the Russian Luna-24 landing and sample return in 1976.

Planetary Geology is not an independent textbook, but it succeeds in being many other things. It is an exciting adjunct to any introductory geology course. It is a means for any earthbound geologist to extend his knowledge into the rest of the solar system. For the general reader, it provides a glorious panorama and a readable text to follow geologists and their explorations. For the artistically minded, it is a coffee-table book of planetary art forms. For the space scientist, it is the ideal gift for friends who wonder what he has been doing with his life. For all of us, it is an exciting review of what we have learned about our companion worlds—and of the many mysteries that remain.

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THE SCIENCES OF MINERALS IN THE AGE OF JEFFERSON. John C. Greene and John G. Burke. Transactions of The American Philosophical Society, Vol. 68, pt. 4, Independence Square, Philadelphia, Pennsylvania, 1978. 113 pages. $10.00.

The 83-year life span of Thomas Jefferson (1743–1826) was a period of cultural, political, and scientific transition. In Europe the Age of Enlightenment succumbed to the excesses of the French Revolution and the upheaval of the Napoleonic Wars, and evolved into the early Romantic Era. Bach was in his final decade as cantor in Leipzig in 1743, and as the years passed both the classical music of Mozart and the romantic compositions of Beethoven were written. By 1826 the young Verdi had been performing for several years as organist in the village church at Le Roncole. The scientific world had been correspondingly transformed by the death of the phlogiston theory and the general acceptance of Dalton's atomic theory, and increased interest in minerals and support for their scientific study was a natural consequence of growing industrialization. Cultural and scientific progress marked this period in European history, and political change was frequent if seldom lasting.

In Jefferson's youth the west coast of the Atlantic was remote colonial territory with an agricultural economy and rudimentary educational institutions. Science teaching and scientific societies on a level of those in major European centers did not exist, and comparability was not to be achieved for many years. During Jefferson's early maturity 13 colonies signed the Declaration of Independence he penned, fought the American Revolution, and established the United States. Later he served the new government in a succession of responsible positions, including two terms as President. His influence on the country through its political and cultural institutions was formative and lasting. In his later years he devoted great energy to education, founding the University of Virginia in 1825. By this time the United States was firmly established as a growing country offering varied opportunities to its citizenry and a refuge to those from abroad. Industrialization was becoming increasingly important in the economy, and there was a need to know our mineral resources and to understand how to use them. After a period of revolutionary political development, educational and scientific institutions were increasing in number, in influence, and in the quality and variety of their offerings.

The book's title is suggestive of the environment of change in which mineralogy developed and finally became established in the United States. These years are also the period during which mineralogy emerged as a scientific discipline in Europe. Jefferson's name is used symbolically. Occasional references are made to Jefferson's associations with scientists and collectors, but it is the Age the authors are concerned with, not the man or his influence. Both authors are historians who first met in 1967. Professor John C. Greene had been studying the activities of individuals interested in minerals during the early years of the American Republic, and Professor John G. Burke had an interest in the history of mineralogy generally, having recently published his *Origins of the Science of Crystals* (University of California Press, 1966).

Chapter headings give a succinct impression of the book's contents: I. Mineralogy becomes a science; II. Europe and America; III. Mineralogy in Philadelphia; IV. The New York mineralogists; V. First efforts in the Cambridge-Boston area; VI. Parker Cleaveland and the unification of American mineralogy; VII. Yale moves to the fore; VIII. Mineralogy in 1822; Index.

The first two chapters provide concise and informative background. Mineralogy's development is reviewed from earliest times to its situation in Europe toward the end of the eighteenth century. During this latter period good mineral collections existed, chemical and physical techniques had been developed to a point where they were useful, and the then current concepts of classification were serving to stimulate laboratory examination and the synthesis of data. The crystallographic work of Haüy combined with the contributions of the chemists Lavoisier, Guyton de Morveau, Berthollet, and Fourcroy in the 1780's are credited with lifting mineralogy to the status of an established discipline. Scientific and educational institutions fostered this work and provided for its dissemination, and economic necessity provided additional stimulus. In America, however, neither highly trained individuals nor essential institutions existed and mineralogy remained "on the descriptive level until well into the nineteenth century."

In the new Republic, cultural and scientific centers developed regionally rather than nationally as was the European pattern. This led the authors to organize their treatment into five chapters that describe developing mineralogical activities by region. The earliest center was Philadelphia, somewhat later New York, and still later the three New England localities. The most important early influences on a given center were those of trained Europeans who visited or immigrated, or of Americans who went to Europe for a period of study and returned home with specimens, books, and journals. Local mineral collections were built by enthusiastic individuals and expanded into more representative collections by exchange, frequently at great effort and expense. Analyses were performed by chemists usually working in newly established medical schools, and their findings were published in medical journals or in publications of the young philosophical and natural history societies. A major advance in American mineralogy was the publication of its first journal, *The American Mineralogical Journal.* Four numbers were published by Archibald Bruce between 1810 and 1814. The journal died with its publisher, having been well received and having established the need for such a publication. The

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gap it left was filled in 1818 by Benjamin Silliman's *The American Journal of Science*. An equally important development was the 1816 publication of Parker Cleaveland's *Elementary Treatise on Mineralogy and Geology*. Serious students of mineralogy now had both a journal to communicate new findings with their colleagues and Cleaveland's *Treatise* to instruct students. The various editions of the *Treatise* provided impetus to draw American mineralogists into closer cooperation and along with Silliman's *Journal* created much interest in American mineralogy and geology in Europe.

The final short chapter summarizes mineralogy in America in 1822. The stage was set. Interested and trained individuals were on hand, mineralogy and geology were becoming established in curricula, collections and laboratory facilities were becoming increasingly available, and institutional support and publication channels were available. But there was still much to be done, and "not until the publication of the third edition of James Dwight Dana's *System of Mineralogy* in 1850 would an American mineralogist of international stature emerge."

The authors draw their story from an extensive knowledge of and appreciation for original sources. Scientific publications of the period, correspondence archives, and biographies and other historical materials are quoted in the text and referred to in numerous and frequently lengthy footnotes. A good index is provided to insure accessibility. With all of this, I found their book highly readable and entertainingly informative about individuals and events that shaped the beginnings of mineralogy and had an important influence on the development of both geology and physical science in America.

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NOTICES

Nominations for Awards, Honors, and Elected Officers of MSA

Members of the Society are urged to take an active part in making nominations for the awards of the Society. Nominations with adequate documentation should be sent to the Secretary, Mineralogical Society of America, 2000 Florida Avenue, N.W., Washington, D. C. 20009, no later than May 15 for transmittal to the appropriate Committee. The nominator must be a member of the Society. The awards are as follows:

1. The **Roebling Medal** is the highest award of the Mineralogical Society of America for scientific eminence as represented primarily by scientific publication of outstanding original research in mineralogy. The science of mineralogy is defined broadly for purposes of the Roebling Award, and a candidate need not qualify as a mineralogist; rather his published research should be related to the mineralogical sciences and should make some outstanding contribution to them. Service to mineralogy, teaching and administrative accomplishment are not to be considered as a primary merit for the award. The award is not restricted to Americans. Nationality, personality, age of the candidate, or place of employment shall not be considered.

2. The **Mineralogical Society of America Award** is given in recognition of an outstanding contribution or series of contributions within the fields of interest to the Society. The work for which the award is given must have been published in a single or series of papers prior to the month in which the candidate's 35th birthday falls. Candidates are limited to persons who shall not have reached the age of 37 before January 1 of the year in which the award is decided upon (1981). The Award shall be made without regard to nationality, personality, or place of employment. Membership in the Mineralogical Society of America or publication in *The American Mineralogist* is not prerequisite.

3. **Fellowship** nominations are invited and forms may be obtained from the Secretary. Three members of the Society must sponsor each nominee.

4. Suggestions for nominations for all offices of the Society are welcome; documentation need not be as extensive as for the awards.

M. Charles Gilbert, Secretary

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