

## Book review

*Advanced Mineralogy. Volume 3. Mineral Matter in Space, Mantle, Ocean Floor, Biosphere, Environmental Management, and Jewelry. ed. A.S. Marfunin. Springer, Heidelberg, Germany, 1998. Hardcover xvii + 444 pp, £138.50*

Well, that's certainly got to be a contender for the most intriguing title of the year. And, in a nutshell, it is the title that instantaneously conveys both the strength and weakness of the book—the subject matter is diverse (good), but the coverage from a 444-page book is necessarily limited (bad). What we have is six chapters roughly corresponding to the six themes in the title. But they are not equal in size; Chapter 1 ('Mineral Matter in Space') and Chapter 5 ('Environmental Mineralogy, Radiation Mineralogy') between them make up more than 60% of the book. Now, the jacket of the book claims that there are contributions from '200 top specialists from all over the world'—not true, there are only 46, and about 75% of them are from either German or Russian institutions.

The first thing that hits you when leafing through the pages is the rather inconsistent style which pervades the book. So, for instance, while Chapter 5 has an overall editor (which makes for consistency within that particular section) the others do not. Some chapter sub-headings are numbered (and consequently have page numbers in the contents list) while others are not. Within individual chapters, reference lists often come at the end of a section with a first-level sub-heading (e.g., 1.1, 2.3, 4.2, etc.), but equally they may also appear at the end of second-level section, for instance where they have separate authors (e.g., 5.3.1, 5.3.2, 5.3.3, etc.). At least one section has no reference list even though there is a

citation in the text (4.1) and one has blocks of references right in the middle of the text (2.2.3 has references on pp. 175, 178, 179, 183 and the end of the section on p. 186).

So, my first impression was one of a book thrown together from a collection of individual works (of which there are about 50) with no consistent style, and no apparent overall editorial control. Now, the book claims to be 'encyclopedic in its coverage' and as such one would not expect to start at the beginning and read through in a linear fashion. However, as an open-minded reviewer I decided to do just that! Chapter 1.1 ('Types of the States of Matter in the Universe') is authored by the volume's editor, A.S. Marfunin. By the fourth paragraph (i.e., 12 lines in) we are already wrestling with the differences between Riemannian, Lobachevskian and Euclidian geometries (and wondering how this is likely to affect mineralogy). Then, the first diagram (on the second page of the article) shows a plot of temperature (from  $10^{-n}$  to  $10^{32}$  K) versus density ( $10^{-30}$  to  $10^{94}$  g cm<sup>-3</sup>), the square so constructed containing nothing other than the phrase 'All types of the states of matter in the Universe'. Pressing on, in a description of one of the states of the G-Universe (Gravitational Universe) we learn that "... mineral matter precedes and accompanies the stuff of life; minerals are a substratum of life. Planetary conditions provide only parallel realisation of biological and geological evolution". And by the last page we learn that the arrow of time, "... can be compared with the structure of a fugue in music. By analogy with the wohltemperiertes Klavier (sic) of Bach, it can be described as a well-tempered Universe". As I get to the end of the article my eyes are drawn to the first entry of the reference list (incidentally, there are no explicit citations in the text of Chapter 1.1, so we do

not know who to blame for some of the more arcane passages) and find that two of the three authors' names are spelt incorrectly and their initials juxtaposed!

Next I turned to Chapter 1.8, 'Mineralogy of meteorites and asteroids'—a subject dear to my heart. The first thing we encounter is the classification of meteorites into stones, stony-irons and irons. This is fine for an introduction but we would expect more detail than this 19th-century view. There is no real mention of the chemical/petrological classification scheme based on the work of Van Schmus and Wood (1967) which is, at least in the West, used universally for the description of chondrites. In contrast we see use of terms such as Ca-rich and Ca-poor achondrites, siderophyres, octahedrites, and so on. Some of these we hardly ever use any more. Take the example of 'octahedrite'—this describes a physical property of an iron meteorite. It is about as useful as the phrase 'coarse-grained rock'—not all coarse-grained rocks are related; the same is true with octahedrites. And yet we have had classification schemes for iron meteorites based on chemistry which go back 30 years or more (there is no mention of these). Terms like 'octahedrite' were concocted in the days when meteorites were curiosities kept in museums for display purposes (they had to have some way of cataloguing the samples!). Things have advanced since those times—for instance, we can now distinguish groups of iron meteorites which come from individual asteroids. OK, Chapter 1.8

does contain a useful list of meteoritic minerals but it also contains many errors. The terms 'H' and 'L' when used to describe chondrites do *not* refer to high and low metal contents—they mean high and low overall iron contents. The term CM is *not* named after the meteorite Murray, but rather Mighei. While iron/stony-iron meteorites *are* formed in magmatic events they are *not* exclusively so—some groups of irons are formed by shock-melting.

In conclusion, the book is, as the title suggests, for the advanced reader only. My concern is that for the subject areas with which I am familiar, there are a number of shortcomings. As such this does not give me confidence in the rest of the text. To illustrate my feelings here, I would be reluctant to give this book to a young and inexperienced PhD student in order to start a literature search—I would be worried that they may start off with the wrong impression of a certain subject. But with that in mind, and as long as caution is exercised, the book contains a veritable cornucopia of information—the advanced reader will know intuitively how to use this resource. I have to say though, I would be extremely unlikely to part with my own hard-earned cash for such a book—at best, only consider this as one for the library.

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