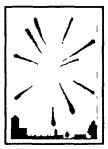

Meteoritics & Planetary Science 36, 1173–1175 (2001)
Available online at http://www.uark.edu/meteor

Books and Multimedia Reviews

Meteorites from A to Z by Michael R. Jensen, William B. Jensen and Anne M. Black, with introduction by Alain Carion. Jensen Meteorites, Littleton, Colorado, USA, 2001, 244 pp., $25 in the US, $30 worldwide (ISBN 0-9679747-2-0).

So close on the heels of Grady's monumental revision of the *Catalogue of Meteorites*, it might be surprising to see a small (14 by 21.5 cm), ring-bound book that attempts to cover much of the same territory, but that is precisely what we have in *Meteorites from A to Z*. To the authors, this work is not so much duplicative as complementary. Looking for a small book they can easily take to meteorite shows, they used the well-known *Glossary of Mineral Species* as their model.

The book is not only much smaller, but the information presented in a compact format. It is divided into six sections: an introduction (written by Carion), alphabetical listing of non-Antarctic and non-Saharan meteorites, a list of numbered Saharan meteorites, a chronological listing of meteorite falls and finds, a geographical index, and a classification index.

The introduction attempts to provide background on the science and classification of meteorites in only five pages. While the introduction does have some noteworthy features, such as pointing out the relatively new groups of primitive achondrites, it is disorganized, inconsistent in its treatment of various groups, in some places outdated (such as maintaining the distinction between Ca-rich and Ca-poor achondrites), and contains factual errors. Among the most shocking in the latter category is the statement in discussing SNC's that each is similar to eucrites, which is certainly not the case for nakhlites and Chassigny.

The alphabetical listing of meteorites assigns each to a single line, listing: name, classification (referenced in some cases), region and country of origin, year of fall or find, a symbol delineating falls from finds, the total number of stones and the total mass. I checked half a dozen entries of meteorites I had classified and found no significant errors.

The section on numbered Saharan meteorites pares the information down even further, listing only the number, year found, classification and total mass in a table under the name of each region of the Sahara.

The chronological index is an interesting arrangement of meteorites by year of fall or find. I was surprised to see eight meteorites listed before Ensisheim, although most of these were either not preserved or the date of fall or find is uncertain. Nogata, which fell in 861 and is still preserved, is an important exception.

The authors appear to place the meteorites in the right geographic locations in the next section, including Murray, which these authors correctly place in Kentucky (based on the entry in the older 1985 catalog), while Grady inexplicably has moved it to Texas.

The last section is, by far, the most perplexing. In the battle of lumpers *vs.* splitters, these authors are dyed-in-the-wool splitters. For example, IAB irons can be found under such headings as (and this is just a few of them): ATAX IAB si., IAB, IAB ANOM, IAB ANOM si., IAB si., O IAB, O IAB ANOM si., ... This extreme division which combines chemical groups, structural groups and the presence or absence of silicates makes the classification index far from useful.

Who should have a copy of this book? If you really do need to be able to carry around a portable catalog that doesn't require a computer, if you don't need to know about Antarctic meteorites because they aren't commercially available, or if you can't afford Grady's *Catalogue of Meteorites*, this book may be for you. If you are mostly thinking of using the book while sitting at your desk, with your computer turned on and Grady's book available, you would probably find this book less useful. In either case, let's hope a 2nd edition includes a revised introduction and classification index and, perhaps, lists the more unusual Antarctic meteorites.

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Ces Pierres qui tombent du ciel by Jean-Paul Poirier. Le Pommier-Fayard, Paris, France, 1999, 159 pp., 99 FF, paper (ISBN 2-746-50024-8).

This paperback can be divided into two parts. The first half is a fairly detailed review and commentary on the evolution of popular thought and scientific consensus that stones really do fall from the sky, and of the scientific conclusion that they are of extraterrestrial origin. In it, Poirier focusses particularly on the events of the last decade of the eighteenth century, quoting profusely from the minutes of the sessions of the French Academy of Sciences, articles in the scientific journals of the day, and other scholarly writings. In this context, Chladni's realization that meteorites come from small planetary bodies of the solar system is seen to be astonishingly prescient. Poirier skillfully connects brief descriptions of the personalities, scientific credentials and possible ulterior motives of the various players with the weight that was given to the opinions of each.

Poirier contrasts the resistance to the acceptance of meteorite falls with the less reluctant acceptance of the reality of ball lightning and the non-acceptance of UFO sightings. All are rarely reported events, but eyewitness accounts of meteorite falls are in good agreement with one another and are often accompanied by recovered meteorite specimens. Accounts of ball lightning are also in good agreement with one another but no traces are left behind, while accounts of UFO sightings are neither similar to one another nor accompanied by tangible evidence.

The second half contains a much less detailed, but still technically sound, account of the scientific importance of the various kinds of meteorites, written in terms easily understood by a layman. Here Poirier mentions the following: obtaining cooling rates from Widmanstatten patterns of irons, pallasites as representatives of core-mantle boundaries, the magmatic origin of achondrites, chondrules as molten droplets, textural modification of chondrites by thermal metamorphism and shock veining, the similarity in composition between the carbonaceous chondrites and the sun, the use of Pb isotopes in dating the solar system, ^{26}Mg in refractory inclusions and the supernova trigger hypothesis, the Titius-Bode Law and the discovery of asteroids, and the spectra and formation of asteroids. Poirier reviews the importance of meteorites as analogs for models of the composition of the Earth and of chondritic minerals formed by shock as analogs of high pressure minerals in the Earth's interior, the discovery of the Antarctic meteorites, and meteorites from the Moon and Mars. Poirier discusses the claim that traces of life forms exist in a Martian meteorite in the context of the history of thought about the possibility of extraterrestrial life; including earlier discredited claims of fossils in carbonaceous chondrites. The book concludes with a discussion of impact craters, and the connection between the Chicxulub structure and the Cretaceous-Tertiary extinctions. The risk of a future asteroidal collision with the Earth is addressed, and the phenomenon contrasted with its treatment in popular books and movies.

I recommend the history of science aspects of this book even to professional meteoriticists. While one might quibble with the omission of important aspects of meteorite research such as the discovery of presolar grains and their implications for nebular heterogeneity, the book does an excellent job of making modern meteorite science accessible to educated laymen. A pity it can only be appreciated by French-speaking people.

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Aiming for the Stars: The Dreamers and Doers of the Space Age by Tom D. Crouch. Smithsonian Institute Press, Washington, DC, USA, 1999, 338 pp., $16.95 (ISBN 1-56098-833-9).

I have a collection of about 12 large scrapbooks, filled with newspaper clippings about the world's space programs. My father would come home from working on the railway, the pockets of his heavy British Railways uniform stuffed full of pages that he had torn from newspapers he found left on the trains. He would unload them ceremoniously on the kitchen table and take great joy in my reaction. Crouch's book brought such wonderful memories flooding back. The book is a history of our exploration of space, with emphasis on the manned space programs of the U.S. and the U.S.S.R. It is a tightly written, very readable, and well-organized paperback book printed on the usual paperback paper that is fine for text, but awful for pictures. That's a pity because the pictures are well-chosen and numerous, but the print quality is very poor.

Crouch starts with Copernicus and Kepler, goes on to Goddard, H. G. Wells, Jules Verne and Tsiolkovsky, and thence to the development of rocketry in Germany and Russia. Then it documents, rather neatly, post-war evolution of missiles and rockets in the U.S. and the U.S.S.R, the Cold War, the race into space, Sputnik, Gargarin, the Mercury, Soyuz, Gemini and Apollo programs. Next comes the post-Apollo era, with the evolution to Shuttle and space stations, Sayut, Skylab, Mir and the International Space Station. Essentially, each step is given a chapter. Finally, there are chapters on robotic exploration of the solar system and future developments.

For a book of this type, written by an American author for a semi-popular audience, the text is remarkably candid. "Goddard was on a branch that died," Crouch quotes Caltech's von Karmàn as saying. "If he had taken others into his confidence, I think he would have developed workable high-altitude rockets, and his achievements would have been greater than they were." Instead, much of Goddard's work was independently duplicated and bettered in Germany and Russia and ultimately it was not Goddard's work that led to the modern space programs. There are many examples of such refreshing candor in the book. Crouch devotes a lot of attention on Goddard, whose role he contrasts with von Braun's. Wernher von Braun's ability to be open and lead large teams was responsible for NASA's successful response to President Kennedy's challenge to land a man on the moon by 1969.

Another strength of the book is the knowledgeable and skillful way Crouch explains the development of space-flight in terms of national and world developments. Of course, it is impossible to avoid describing the space race without mentioning the Cold War, but the role played by the strengths of national economies, world conflicts, advisory groups, the whims of politicians, and the Soviet and then Russian economy, the comings and goings of various presidents and NASA administrators, and many other forces, are all apparent in Crouch's text. Even the well-known tension between engineering and science, so important and yet hardly