

# METEORITE

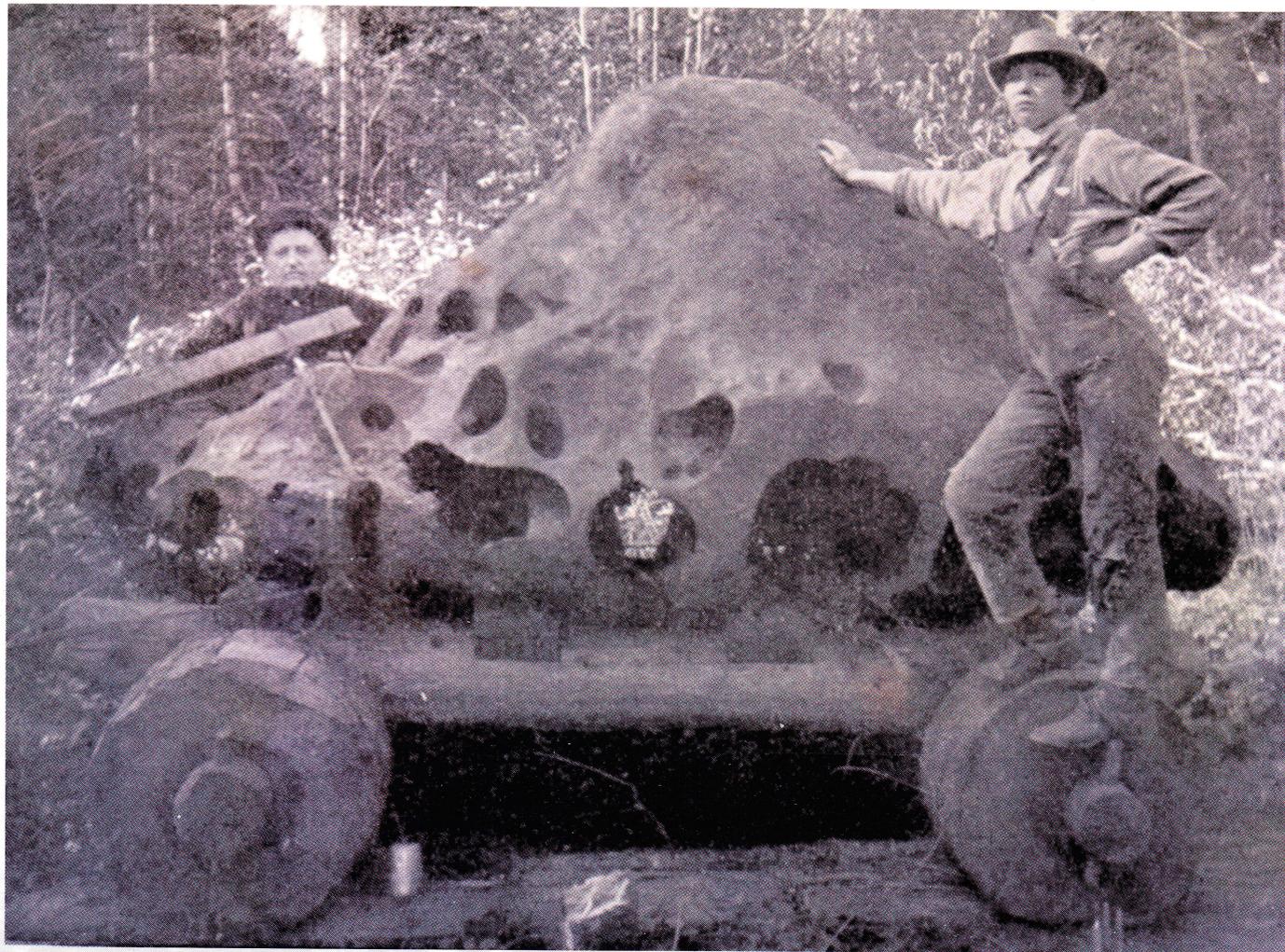
MAY 2006 VOLUME 12, No. 2

THE INTERNATIONAL QUARTERLY OF METEORITES AND METEORITE SCIENCE

## IN THIS ISSUE

**SOUTHWEST METEORITE CENTER  
CHONDRITE CLASSIFICATION  
TUCSON 2006**

**ANGRA DOS REIS  
ICE METEORITES  
COMETARY METEORITES**



**The Willamette meteorite**

own navigation page, especially since the long list of specimens is presented in order over several columns; for example, Ellersile is at the bottom of the very long page while Elsinora is at the very top of the page. Separate pages for the numbered locations would also make updating the lists much easier since little or no reformatting would be needed, and pairing could be noted without adding confusion to the overall list.

The page for Antarctica has just such a formatting, since a listing of all specimens from the cold south would be unbearable as it numbers in the thousands if not tens of thousands of individually numbered meteorites (I did not bother to count them all). In fact, even the main page of locations in Antarctica is still 59 names long with some of those locations further subdivided into discovery years. There are many picture links to the Antarctica specimens scattered throughout the listings, including photos of individuals, fragments, micromounts from collections, and many thin sections. There are also a few maps and aerial photos. One of my favorite cold desert specimens is Lewis Cliff 85320, a 110 kg monster affectionately known as Big Lew. I had the pleasure of meeting Big Lew in person years ago in a clean room in Houston. It was nice to see a picture of him on this CD.

A real treat is found behind the link to ALH84001, which I think should have been given its very own link as was done for the Thiel Mountains pallasite. When I printed the ALH84001 webpage, no less than 20 paper pages erupted from my printer, listing 90 article references and 23 color pictures, including many of the famous ones.

Another area where way too much information is presented on a single webpage is that for Oman. As you likely know, Oman is home to the Dhofar series (1,275 specimens listed) and the Sayh al Uhaymir series (281 specimens listed) of meteorites, as well as 10 other numbered locations. In fact, only three non-numbered meteorites are listed for Oman. So if you want to click on the link to the L6 chondrite named Tarfa, you would need to scroll through the equivalent of nine printed pages just to get to the link. If there were only links to the non-numbered meteorites and to the name of each numbered series,

the 10 pages of information could be organized on this level to a manageable 15 links.

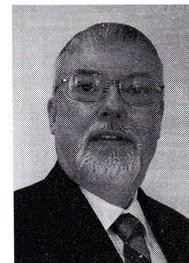
The search engine built into this database is another excellent tool for searching or just managing these data. The engine runs reasonably quickly, depending upon the parameters of the search. When I searched the word "fall" on the CD, it took only 10 seconds to acquire the 99 hits on my 1.5 GHz Apple G4 PowerBook with 1.25 GB of RAM running in an energy saving battery powered mode (in case anyone wants to know I was actually sitting in a snow covered cabin in the mountains of Montana). The search term "howardite" on the other hand, took 29 seconds to recover 43 hits. But it appears that the text of PDF documents might have been searched, as well as the internal workings of the CD, since the search help page also showed up in the search results. One other issue I noticed while exploring the search engine involved the Chinese fall named Songyuan. It appears that an intact webpage from the MeteoriteTimes.com is archived on this CD. It does not appear to have links to it except through the search engine, but it begs the question of what else might have been buried in here when this database was compiled.

Overall, the CD is both a worthy companion to the others in this series, and a notable addition to any meteorite library.

Since my interest in meteorites is not easily divided by political boundaries (especially since they have been known to change from time to time), I suspect that a complete database for planet Earth in this same format will be available sometime in the future, and likely on DVD. So one can spend their money now to have the CD set, or spend a similar amount later (possibly?). The choice is yours, but remember, knowledge is power, and with the split-second decision-making often found in today's online trade of meteorites, great specimens often fall into the hands of knowledgeable collectors. And as far as I can tell, knowledgeable collectors use computerized meteorite databases.

*E-mail: accretiondesk@gmail.com*

**Killer Rocks from Outer Space Asteroids, Comets, and Meteorites;** by **Steven N. Koppes;** Price \$US27.93; Available at [www.amazon.com](http://www.amazon.com)

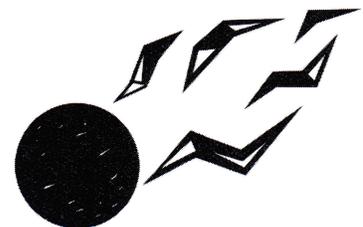


by  
**Mark  
Trueblood**

"The chances that any given person on Earth will be killed by a cosmic bomb in

## METEORITES & TEKTITES

An extensive selection of meteorites, tektites, and thin sections



**MICHAEL BLOOD METEORITES**

[mlblood@cox.net](mailto:mlblood@cox.net) Ph: (619) 286-4837

See my website:

[www.michaelbloodmeteorites.com](http://www.michaelbloodmeteorites.com)

any one year are about the same as the odds of dying in any one commercial plane flight." The term "cosmic bomb" is what Steven N. Koppes uses to describe a potentially hazardous object in his book published in 2004 on the subject of asteroids and comets that have impacted the Earth in the past, and may threaten to do so in the future. The book's focus is on impacts by asteroids and comets on solar system bodies, primarily Earth. It does not deal with the general orbital, structural, composition, geologic, or chemical properties of asteroids or comets except peripherally as these influence the objects' chances of impacting the Earth. For that type of more general introduction for asteroids only, the lay public is better served by Clifford Cunningham's *Introduction to Asteroids: The Next Frontier*, originally published by Willmann-Bell (no longer in print, but available as of this writing on amazon.com), while specialists in the field probably already have the *Asteroids* series and *Hazards* book published by the University of Arizona Press.

In a mere 103 pages, Koppes introduces the general public to Near Earth Objects (NEOs, including both asteroids and comets with orbits bringing them close to the Earth) using seventh grade sentence construction and vocabulary. One writing for an intelligent, educated adult audience would have conjoined the sentences and rearranged them to make them flow better. As I read the book, I felt as though the author was talking down to me. Although there were a few technical mistakes that will be detailed later, overall Koppes apparently researched the subject adequately to write a good introduction to this specific topic of impacting asteroids and comets for the lay public.

The chapters are laid out logically, telling the story of impact geology in temporal sequence. Koppes begins with an event many readers remember, the 1994 impact of Comet Shoemaker-Levy 9 with Jupiter, comparing the force of those huge explosions to our relatively puny thermonuclear weapons. He then begins the tale of impact science in Chapter 1 with Meteor Crater in Arizona and the problem of determining whether these large holes

in the ground were formed by volcanic eruption or falling rocks. The reader is introduced to impact geology in Chapter 2, a discussion of the K-T impact and the extinction of the dinosaurs in Chapter 3, periodic mass extinctions in Chapter 4, how impacts might actually create life in Chapter 5, why NEOs pose a continuing threat today in Chapter 6, ending with a discussion of how to protect the Earth from threatening NEOs in Chapter 7.

In such a short book written for the lay public, Koppes could not and did not attempt to deal with all of the subtleties and nuances of scientific detail in treating this technical subject. While I recognize that this broad brush approach often uses generalizations for pedagogic purposes that mask scientific controversies to preserve the flow and simplicity of the key points, Koppes did take some liberties that went a bit too far. For example, on page 25 he states, "Lunar craters survive virtually forever because the Moon is a dead planet." Although planetary scientists can't seem to agree on what is a planet, almost all would agree the Moon is not a planet. Substitution of "body" or even "world" for "planet" would have cured this problem.

Pictures are usually used well to illustrate the text, but the source of the pictures is not given with the images themselves, and the labels are vague and sometimes misleading. On page 64, the image of the lunar South Pole-Aitken Basin impact crater (supplied by the Clementine Project) shows a large black dashed circle, but the caption does not make it clear that the Basin and crater is the area colored (in false color) magenta and purple, not the entire area encompassed by the circle. On page 79, the image on the preceding page is attributed to "A NASA artist". It is the work of Don Davis, who at one time worked for the U.S. Geological Survey in Flagstaff, Arizona then later became a freelance artist working under commission to NASA and others, according to his Web site, but never as a NASA employee. The confusion may have arisen because the artwork is available on a NASA Web site.

On page 67, Koppes writes "... astronomers ... saw six small impacts on the night (dark) side of the Moon." As

NASA writes on their Web site at <http://liftoff.msfc.nasa.gov/Academy/UNIVERSE/MOON.HTML>, there is no such thing as the "dark side of the Moon" as known in common parlance. What the general public (the audience for this book) usually means when they use this term is the *far* side of the Moon, that is, the side we do not see as a result of tidal locking of the Moon's rotation and orbital rates. What Koppes is referring to is that part of the Moon facing us that is not sunlit due to the phase of the Moon. Referring to this as the "dark side" of the Moon is both incorrect and confusing.

In general, despite the middle school sentence construction and vocabulary, the book is well edited in that there are extremely few errors in spelling, grammar, punctuation, and usage. The only one I could find is on page 74, where the word "to" was omitted between "belong" and "the" in the sentence, "Many martian meteorites belong the shergottite-nakhlite-chassignite (SNC) category of meteorites."

An example of glossing over the nuances and debate in science is found on page 79, where Koppes writes that "[a]n impact striking water will be just as deadly as one that hits land." He goes on to describe the results of computer simulations at Los Alamos that predict devastating tsunamis from an impact of an object 1 km in diameter. He does not mention that Jay Melosh at the University of Arizona and others have argued that such simulations fail to take certain conditions into account; consequently, the resulting tsunamis will be far less devastating than originally predicted.

On page 87, Koppes mentions using modern electronic cameras employing Charge Coupled Device (CCD) detectors similar to those used in camcorders and pocket digital cameras, though optimized for astronomy. He then drags a red herring into the discussion by mentioning a technique abandoned 20 years ago in astronomy, using photographic plates and a stereoscope to search manually for new NEOs. Today, even amateur astronomers working in their backyards can afford CCD cameras and software customized for searching for moving targets, and for

reporting the results to the Minor Planet Center in its required format. Mentioning the stereoscope added nothing to the discussion, and only diverts attention from the main topic.

Finally, Koppes repeats a common misconception about diverting incoming NEOs with thermonuclear weapons. He states on page 94, "But detonating a bomb some distance away from the cosmic missile [the NEO] might force it into a new orbit." In fact, it will not budge. On Earth, the destructive power of a nuclear bomb is generated by the pressure wave moving through the Earth's atmosphere. There is no atmosphere in space, and thus no blast wave. There would be a pulse of heat radiation and neutrons, but not enough to heat the surface of an asteroid or comet enough to change its orbit, especially if the bomb is "some distance away." The inverse square law applies equally to heat radiation generated by thermonuclear weapons and to heat generated by the Sun. To change a body's orbit, one would need to drill down into it, plant the weapon into one side of a presumably rotating body, and detonate it at precisely the right moment to send it in the right direction. At least Hollywood got it half right when they sent oil well driller Bruce Willis to drill down into an asteroid in the movie *Armageddon*. The screenwriter knew you could not detonate a nuclear weapon in space and affect the asteroid's orbit.

Aside from these few errors, *Killer Rocks from Outer Space* is an excellent introduction for the general public to the specialized topic of Earth impacts.

E-mail: [mtrueblood@noao.edu](mailto:mtrueblood@noao.edu)

Mark Trueblood observes NEOs to perform follow-up astrometry. His research interests include minor planet photometry.

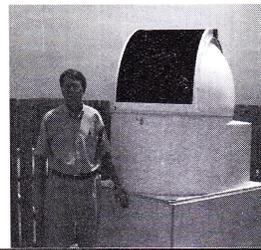


The Arkansas Center for Space and Planetary Sciences partnered by the Department of Physics at the University of Arkansas offers two free astronomy workshops for teachers each summer.

***STORI: The Summer Triangle: Observing, Research and Inquiry***  
(grades 4-8) - June 12-16

***WebScopes in the Classroom***  
(grades 7-12) - June 8-10

For more information on these workshops or to register, please visit our Web site at <http://spacecenter.uark.edu/81.htm>



# METEORITICA

## Meteorites:

All recent falls from North Africa  
& many rare meteorites...

## Meteorite books:

*Impacts Majeurs (80 pages in French),  
Histoires de Météorites - Volume I - Ensisheim  
(184 pages in French), english version at the early 2006.*

Shipping & Handling free worldwide for the readers of this publication.

Philippe THOMAS & Léa DEJOUY  
[info@meteoritica.com](mailto:info@meteoritica.com)

[www.meteoritica.com](http://www.meteoritica.com)