Meteorite Times Magazine

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No matter how you slice it, the unique crust of Cumberland Falls looks makes individuals look like a loaf of bread.

The Domesday Book written in the year 1086 contains the results of a great survey of much of England and Wales. It was created for William the Conqueror and according to Wikipedia, “One of the main purposes of the survey was to determine who held what and what taxes had been liable under Edward the Confessor; the judgment of the Domesday assessors was final—whatever the book said about who held the material wealth or what it was worth, was the law, and there was no appeal.”

Nine hundred and twenty years later a well-crusted fragment of the witnessed meteorite fall named
Cumberland Falls landed in my collection replacing a small sample that had been the placeholder for over a decade. The Cumberland Falls meteorite is a fascinating study in itself.

According to Alan Rubin, "Aubrites (enstatite achondrites) are highly reduced differentiated asteroidal meteorites that have experienced a significant collisional history.

Most aubrites are brecciated: the majority are monomict fragmental breccias, a few are regolith breccias containing solar-wind-implanted noble gases, and at least two are polymict breccias.” Cumberland Falls falls into this latter exclusive category.

So what is the connection between the Domesday Book and the fall of the Cumberland Falls meteorite? While it would fun to fly off on a science fiction action adventure like James Rollins did, instead I'll cut to the truth. From what I've been able to decern (and with history, there is always room for interpretation), the Cumberland Falls meteorite was named after the Cumberland Falls, a waterfall in Kentucky often referred to as the Little Niagara and famous for its moonbow.

The Cumberland Falls waterfall was named after the Cumberland River, the body of water that feeds the Fall's insatiable appetite as well fills the banks of Lake Cumberland, the deepest lake in the region. The Cumberland River in turn was a continuation of a Cumberland naming tradition that was immediately preceeded by the Cumberland Gap, which followed the naming of the Cumberland Mountains. At this point, the sequence of Cumberland names began in 1874 when Thomas Walker, a surveyor from Virginia first gazed upon the mountains while

Cumberland, the name chose by Walker was in vogue in America, and according to Walker's diary entry for April 17, 1750, "I went down the creek a-hunting, and found that it went into a river about a mile below our camp. This, which is Flat Creek and some other join'd, I called Cumberland River."
Too weird. The distinct color of the fusion crust is just one of several variations found on aubrite meteorites. Although the matrix material looks similar, contrast the Cumberland Falls crust above with the Pesyanoe crust below.
Cumberland ‘anything’ was named after Prince William, the Duke of Cumberland, which, of course, was named after the county of Cumberland in northwest England. The region named Cumberland first appeared in print back in 945, but by the time the Domesday Book was written, much of what would be the county of Cumberland was listed as part of Scotland.

The archaic use of the word “cumber” is to trouble or harass so presumably, especially given the record of political unrest across the Cumberland region of Scotland/England back a thousand or so years, the folks of the area may have preferred a certain way of life thus cumbering the powers-that-be bent on claiming government ownership of the land.

A more modern definition often stemming more from the word encumber which is the act of cluttering up something is to encumber it. Essentially aubrites, and in particular the polymict breccia Cumberland Falls is cluttered up. Continuing, the state of being cluttered up is to be cumbered. Further, cumbered can also mean to “be in the way of” or “to hinder.”

Therefore as the recipient of a meteorite, it also follows that the Cumberland Falls on the Cumberland River in the Cumberland Gap hindered or got in the way of the space rock when it was dislodged from its solar orbit by Earth’s gravity. And again, therefore, the geologically encumbered meteorite that fell near Cumberland Falls was due to the area of Cumberland Falls encumbering the rock that would become the Cumberland Falls meteorite.
On display at the Smithsonian's National Museum of Natural History in Washington DC is an exceptional piece of Cumberland Falls. The polish on the surface is stunning.

I remember asking Tim McCoy about the preparation of this piece and he just smiled and said that the folks at the Smithsonian are very good at such things.

The following article written in 1919 by Arthur M. Miller of the Department of Geology at the University Of Kentucky represents the possible first scientific report documenting the Cumberland Falls fall and the study of the meteorites themselves.

**Discussion and Correspondence The Cumberland Falls Meteorite**

On April 9, last, a brilliant meteor was seen at mid-day to fall in a northwesterly direction across northeastern Tennessee. Though the sun was shining in this section, observers describe the light from the meteor as exceeding the sun in brightness. Passing over southeastern Kentucky, where the sky was obscured by clouds, the meteor made its presence known by violent detonations, accompanied by the spalling off of fragments.

The first of these fell near Sawyer P.O. [post office], not far from the Falls-of-the-Cumberland. The concussions produced by the bolide were terrific, causing buildings to rock, and producing the impression on some that the region was being visited by an earthquake.

The first news of the phenomenon printed in the local papers so recorded it. Realizing that the detonations heard and shocks felt were due to the concussions produced by a falling meteorite the writer through the
medium of these local papers, and by correspondence with postmasters and telegraph operators throughout the district affected has succeeded in determining the path of the meteor and has secured a number of the fragments.

The main mass appears to be yet undiscovered. Falling in the most rugged and sparsely settled portion of southeastern Kentucky the prospects of this main mass being found are not promising.

The general azimuth of the meteor in its fall seems to have been about north 30 degrees west. Over Kentucky it paralleled roughly the line of the Cincinnati Southern Railroad.

Richly sprinkled with iron, a broken face of Cumberland Falls is a study in terrestrial camouflage. Had the stone not been witnessed to fall, it likely never would have attracted even a hint of attention.

An interesting incident in this connection is the record of the progress of the meteor kept by the telegraph and telephone operators in the railroad stations and signal towers. They actually put it on a schedule something like an "extra," and heralded to operators ahead the arrival opposite them to the east of this mysterious visitor.

The operator on another branch of the Southern Road at Coal Creek, Tennessee saw the meteor disappear to the northwest at 12:21 PM. The tower man at Tatesville, Ky., heard violent detonations to the east, and felt his tower rock at 12:27.

Telephoning ahead to the Danville, Ky., operator, while yet talking to him he heard him reply at 12:30 "I hear it coming now." The distance from Tatesville to Danville in an airline is 48 miles. It took the meteor sounds, therefore, 3 minutes to travel this 48 miles. How much of this is due to the rate of sound traveling in air and how much to the northwest component rate of the falling meteorite can not at present be stated. It seems now to be pretty well established that the meteor never crossed to the west side of the Cincinnati Southern Railroad.
For the forthcoming Bulletin of the Kentucky Geological Survey the writer has delineated upon a map of a portion of southeastern Kentucky the area in which all the fragments of the meteorite will probably be found.

At present writing seven pieces ranging in weight from 13 oz. to 5 1/4 lbs. have been found that by their covering of glaze indicate that they split off from the main mass at a considerable distance from the ground.

Fifty-two pieces weighing from less than an ounce up to four pounds have been found that are parts of a mass weighing originally about 31 pounds. This mass was broken into these numerous fragments as the result of falling on top of the conglomerate cliff which forms the walls of the gorge of the Cumberland River below the Falls.

The larger fragments, which split off from the main mass at a considerable height, besides the covering of glaze, have the characteristic pittings of meteorites. They are light gray in color, and exhibit a brecciated structure. A chemical examination of the material of which they are composed, made by Dr. Alfred Peter, of the Kentucky Agricultural Experiment Station, shows it to be mainly the mineral enstatite (silicate of magnesium).

Through this is disseminated microscopic particles of nickel-iron and iron combined with sulphur in an amount not exceeding two tenths of one percent. Small amounts of sodium and calcium are also present. The meteorite would therefore be classed as a chondritic aerolite. It has the same specific gravity as enstatite, 3.18.

One of the indicators of something being a meteorite is the contrast between an external crust and the internal matrix. However, Cumberland Falls, while following this rule, is also an exception to it.

It is interesting that as late as 1919 an obvious achondrite like Cumberland Falls should be mistaken for a chondrite. Or is it?

Again, quoting Rubin, “Cumberland Falls is a polymict breccia with a suite of chondritic inclusions that are probably of ordinary-chondrite (OC) parentage.” And Rubin continues, “All of the chondritic clasts in
Cumberland Falls appear to be related. It is statistically unlikely that several different chondritic projectiles unrelated to aubrites would be incorporated into Cumberland Falls. Therefore, it seems reasonable to infer that the chondritic clasts are all remnants of the same projectile that impacted the Cumberland Falls region of the aubrite parent asteroid.”

Intact specimens of Cumberland Falls look much like fresh loaves of bread, in particular a Brioche, with the brown fusion crust wrapping a white bread interior. Although bread crust is caused by the Maillard reaction instead of atmospheric friction, the visual effect is the same. But no matter how you slice it, Cumberland Falls is an amazing gift from space.

In the old picture above, a 2.347kg complete individual of Cumberland Falls highlights the surface of the meteorite, but fails to present the crust in such a way (i.e. color) that really sets Cumberland Falls apart from other meteorites including many aubrites.
The interior of Cumberland Falls is a study in what a galaxy filled with light matter would look like. Rubin noted, "Therefore, it seems reasonable to infer that the chondritic clasts are all remnants of the same projectile that impacted the Cumberland Falls region of the aubrite parent asteroid."

According to the garden-fountains.com website, "There is a local haunting legend that states one such newlywed couple visited the falls only to meet disaster. In the 1950's the couple was on their honeymoon and spent it admiring the falls. They hiked up to the overlook of the falls to get some good pictures towards evening. The bride wanting to get an unusual pose stood on a pillar near the cliff. She slipped and fell 70 plus feet to her death. It's said that she cried her husband's name as she fell. Every now and then a woman is reported to be seen floating in the air over the falls area, beckoning to those who see her."

Me, I'll always imagine a meteorite falling by the falls beckoning to be collected.

**Until next time….**

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The Accretion Desk welcomes all comments and feedback. accretiondesk@gmail.com
Even with the diminishing supply of nice unclassified NWA material showing up at Tucson year by year I was able to find some pretty nice stones at the last show. I thought that this month you might be interested in seeing what these mystery stones turned out to look like when I got them home and lapped a window on some of them.

Oh before I forget I got these for just 6 cents per gram. Yes they were mixed into a couple big boxes of really bad material but it always pays to look anyway.

This 630 gram stone has quite an attractive shape with regmaglyphs and pretty nice fusion crust on most of it surface. It was a little bigger at one time for one surface was broken in antiquity. I lapped a small area and there are visible chondrules that are not perfect but easy to make out some of the metal is gone yet enough remains to make a guess that it is not an H type. So I maybe have another L 5 or 6. Still it is a big nice meteorite that will give me enjoyment without much worry for years to come.
We joke about space potatoes, meteorites that have nothing in their shape to make them attractive. Often they are used as cutters to be sliced and diced for selling. Well, this next offering is really shaped like a potato. It had a large broken face on one side. It only took lapping off a couple grams to make it smooth. It turned out to be a wonderful stone with tightly packed chondrules of a wide range of sizes and colors. Hard to tell from the visible metal if it is mostly there or if much has weathered out. There is not much metal. But, I got 426 grams of a really cool looking probably type 4 meteorite.
There was another space potato in the batch I bought. But, like most meteorites if you appreciate them and look carefully you will find something remarkable. Well this one was fairly heavily recrystallized. I can only see a few chondrules in poor shape remaining. But it has some very nice shock lines running through it. And the dark alteration zone of the fusion crust is about as thick as I have ever seen. There are brown bubbly spots on top of the rest of the black fusion crust. I think when this was fresh it would have really
been a sight to see. The metal is a uniform scattering of very small grains there are also graphite colored spots of altered metal in the chocolate colored matrix so it is fairly heavily weathered. A nice solid crack free 298 gram piece that I can display without worry.

At 104.8 grams the next stone is almost the smallest of the 6 cent per gram ones I bought. But, it had some real surprises too. It has a very porous groundmass. Its light color and nice mostly gray fusion crust are both indicators of slight amount of weathering. There are very few visible chondrules. With the exception of the very unusually large metal grain the metal consists of tiny grains. Some troilite grains are scattered around too. There is an eruption on the surface which I would guess is another large metal grain which has swelled up during weathering is would have soon popped out of the surface completely. It is now safe and dry to remain a feature on the crusted side.
I got several other stones in the batch. Each has features that make it unique and interesting. Are there really any ugly meteorites that are not worth looking at? I bought one a few years ago near the beginnings of the NWA rush. It was listed on EBAY which had just started to get going "as the ugliest meteorite on earth". It was a 1440 gram heavily fractured lump of stone. I have to admit it was not attractive. But, I got it in the mail and took it to the saw and cut a slice through the edge. And what did I find. A wonderful meteorite just full of easy to see light gray pyroxene radial chondrules of all different sizes. Back in those days you could still send a meteorite off to be classified. I sent a piece of this one and one other away to get them made official. The ugliest meteorite ever became NWA774 which I still have the main mass of and which Paul and I have sold pieces of for years.

So sometime you may see a guy with his head down in a box of really poorly looking meteorites. Just come over and say hi. Very likely it will be me searching for overlooked and hidden treasure. Until next time, Jim.
Meteorite-Market Trends
by Michael Blood

This Month’s Meteorite Market Trends

by Michael Blood

Please Share and Enjoy:
The article that appeared in the 2009 November issue of *Meteoritics & Planetary Science*.

When I first saw the image of the Yaringie Hill meteorite on the cover of the 2009 November issue of Meteoritics & Planetary Sciences (M&PS), I have to admit that I didn't know that it was an Australian meteorite. But I quickly found this to be the case when I turned over the journal to read the Table of Contents, and there at the very top of the table was the lead article:

"The mineralogy of the Yaringie Hill meteorite -- A new H5 chondrite from South Australia" by B. Tappert, J. Foden, and A. Pring

It really caught my attention to see an image of an Ordinary Chondrite grace the cover of MAPS, as well as be the lead article. Other than being a meteorite from Australia, I was curious to find out what was so "special" about this H5 chondrite, so I read the article immediately. Although what I read was a well-written paper that thoroughly described this "recent" 2006 find and successfully made its case that the Yaringie Hill (YH) meteorite "is not related to any of the other meteorites described from the Eyre Peninsula", I failed to find that "special" feature about this meteorite that would prompt the editors to place this article with such prominence in their journal. And now, more than a year later, I am still so curious that I am prompted to write about it.

Maybe it was the very fact that some researchers went to the trouble to write a paper about an H5 chondrite that made the YH article "special" in the eyes of the editors. Given the current surplus of much rarer meteorites, and the backlog of classifications and papers to be published by meteoriticists, it may have been a breath of fresh air for the editors to see an article submitted that harkens back to the days of
the earlier journal, *Meteoritics*, when articles about "recent aerolite finds" were the norm and not the exception, as they are now. I'm not saying that there is a surplus of meteorites found in Australia, because the *Meteoritical Bulletin Database* only lists less than 20 meteorite finds since year 2000 for that continent! But obviously someone (or some people) felt a need to write this paper. At this point my attention is drawn to the authors of this M&PS article.

Prior to this article, Ralf Tappert, the "first-author", and John Foden had never written an article about meteorites. Although they wouldn't be considered meteoriticists, they are well-established and well-published Australian mineralogists. The co-author, Allan Pring, appears to be the connection to the Australian meteoritical community, or at least was very actively involved 20 years ago. Back at that time Dr. Pring was the co-author of several papers that described the mineralogy of the Loxton (H6), the Mangolo (L6), the Streaky Bay (L4), the Ethninda (L4), and the Crockers Well (LL7) meteorites. In that same time period (20 years ago) he was co-author with A. Bevan on the article titled, *Guidelines for the Naming of New Meteorite Finds from the Nullarbor Region, South Australia*. All of these articles in which he was a co-author were published in the *Meteoritics* journal. More recently Dr. Pring co-author on a paper written by G. Horr describing the Kimba (H4) South Australian meteorite in 2005. In 2008 Dr. Pring joined (or re-joined?) the Meteoritical Society.

Dr. Allan Pring is the lead mineralogist for the South Australian Museum (SAM) mineral collection, which contains meteorites from 150 localities and is the lead researcher for the Mineralogy Research Group. The type specimen and the main-mass of the Yaringie Hills meteorite is a "recent" addition to this mineral collection. Having been the co-author on papers for so many prior Australian meteorite finds, it's not surprising that Dr. Pring would be the co-author on a paper describing the mineralogy of the most recent addition to the SAM meteorite collection.

Ralf Tappert and John Foden are identified in the Yaringie Hill article as being members of the faculty at University of Adelaide, Geology and Geophysics, School of Earth and Environmental Sciences, 5005 South Australia, Australia. These three authors should receive some sort of recognition for taking the initiative to write (and get published) the Yaringie Hill mineralogy article at a time when other meteorite specialists, and the more established meteoriticists, were too busy researching the "higher profile" meteorites with the rarer mineralogy. It just might be that they did receive that "recognition" when the editors of M&PS placed the image of Yaringie Hill on the cover of their journal and made it their lead article.
This Figure was used to show where the Yaringie Hill (H5) chondrite and the other equilibrated chondrites were found in the Eyre Peninsula of South Australia. (You can click on the above image in order to ENLARGE.)

The YH meteorite was found on October 18, 2006, by Dr. Peter Hudson (an entomologist) while conducting a faunal survey. In other words, this find was NOT made during a meteorite-recovery effort. The faunal survey was funded by the Waterhouse Club of the South Australian Museum. There was some additional financial support provided by the Australian Research Council (ARC), but the classification and publishing of these results was primarily a volunteer effort.

The YH article was received by the editors of M&PS on 26 May 2009. A subsequent revision was accepted on 24 July 2009. The Meteoritical Bulletin #96 was "published" with a "September 2009" date. At some point in time prior to September 2009 it would have been impossible to make a revision, correct a typographical error, or make a last minute change to a meteorite's classification. The MB#96 appeared "in print" when Meteoritics & Planetary Science Vol. 44, Nr. 9, Pages 1355–1397 was published in November 2009.

Although it wasn't mentioned in this M&PS article, the Yaringie Hill chondrite was listed as H6 when the Meteoritical Bulletin #96 (Table 9 - page 48) was published. The YH article did describe in detail (under the "Classification" paragraph) their petrographical evidence for determining a "type 5 classification" versus a type 6 petrologic grade.

[A quick read of that paragraph would serve as a good review of the current conventions used in determining "where to draw the line" between petrologic grades 5 and 6.]

To the best of my knowledge, there has been no "Correction" appearing in print in a subsequent Meteoritical Bulletin (other than the Database) to formally change the YH classification from H6 to H5.

One final thought (almost as an aside), but maybe this "revision" to the YH classification was the impetus that prompted the editors to place the YH article with such prominence in their journal? Whatever the reason, I would like to see a return to the "new chondrite find" articles like this one that harkens back to the days of the old Meteoritics journal. I would like to collaborate with a couple of mineralogists in order to publish some articles about the "mineralogy of a new chondrite find". I've got a number of North American equilibrated Ordinary Chondrite main-masses that we can write about, so contact me!
This Figure was used in their article as graphical evidence that Yaringie Hill is an H-chondrite and that it is not-paired to the other chondrites found in the Eyre Peninsula of South Australia. (You can click on the above image in order to ENLARGE.)

In conclusion, I must admit to being very jealous of the Yaringie Hill meteorite (- the "new" (H5) chondrite from South Australia), because I wish that some North American ordinary chondrites would receive the same attention.

References:

Link to the Meteoritics & Planetary Science (M&PS) website for the November 2009 article:
The mineralogy of the Yaringie Hill meteorite — A new H5 chondrite from South Australia ...

Yaringie Hill (H5) meteorite entry in the Meteoritical Bulletin Database:
http://www.lpi.usra.edu/ meteor/metbull.php?code=48950

List of all "Australian" meteorites in Meteoritical Bulletin:

Yaringie Hill (H6) entry in Meteoritical Bulletin #96:
http://www.lpi.usra.edu/ meteor/docs/mb96.pdf

Link to a story about an Australian meteorite find and how it came to be confiscated, as told by finder on the Australian Gold Detecting and Prospecting Forum.
The reaction to this story is a good example why meteorite finds in Australia are no longer being reported by their finders.
This find came to be known as the Kimba (H4) Meteorite.
Here is the link to Allan Pring’s paper describing Kimba (H4) and to its entry in the Meteoritical Bulletin #82.

Link to the Wiley ON-Line Library website for:
Meteoritics & Planetary Science - Volume 44, Issue 11 - November 2009 ...
Direct link to article for subscribers:
*The mineralogy of the Yaringie Hill meteorite – A new H5 chondrite from South Australia. (2009)*
Tappert, R., Foden, J., Pring, A.

My previous articles can be found *HERE*

For more information, please contact me by email: *Bolide*chaser
NEW YORK TIMES
The ads are for chunks of meteorites, bits of asteroids that have fallen from the sky and are as prized by scientists as they are by collectors. As more meteorites have been discovered in recent years, interest in them has flourished and an illegal sales market has boomed — much to the dismay of the people who want to study them and the countries that consider them national treasures.

"It's a black market," said Ralph P. Harvey, a geologist at Case Western Reserve University who directs the federal search for meteorites in Antarctica. "It's as organized as any drug trade and just as illegal."

RESPONSE
Not so! Every year in February the whole Meteorite Community descends on Tucson for two weeks. Within just one hotel, Hotel Tucson City-Center (formerly InnSuites) I counted ten meteorites dealers with large banners and ads on all the Bulletin Boards, and this is just one hotel during a show that takes over the whole city of Tucson, a city of about 1 million inhabitants. Other large mineral shows around the globe (Munich, Tokyo, Sainte Marie aux Mines) also have a large number of meteorite dealers. And the Ensisheim Show is only about meteorites, and this year will be the 12th year that show has brought in collectors, dealers and a number of scientists in that small town in eastern France. And if you do not go to shows, you cannot miss the meteorites on eBay, 5,731 of them as of right now (although, to be fair, quite a few of those are really meteorwrongs!). You will find meteorites have been sold by the largest and most reputable auction houses (Sotheby's, Heritage, Botham-Butterfields) for quite a few years now. There is even a rather successful show on television, Meteorite Men, on the Science Channel. So if this is your idea of a "black", "illegal" market it certainly is the most widely publicized of them all.

To be fair, I called Dr. Harvey and asked him about his comment, and he told me that he was only referring to the Gebel Kamil meteorite, and "speaking of illegal activities...illegally obtained meteorite..." He also asked me to reassure the meteorite community that his comment was certainly not meant as a general statement about the whole Meteorite market. Here is what he authorized me to publish:

"To be most specific, my 'black market/drug trade' comment was a small part of a response to W. Broad's expressed incredulity at the volume of meteorites that have been removed from Northern Africa and the scale of operations implied by Gebel Kamil online sales. Unfortunately the author used
A quote from me for dramatic effect; leaving out 40 minutes of context and leaving the erroneous impression that I think all meteorite collectors are criminal. Nothing could be farther from the truth. I have made a career out of meteorite hunting, working within some of the strictest legal constraints (look up NSF regulation 45 CFR Part 674, RIN 3145-AA40 in the US's Federal Register, Vol 68, No. 6: p.15378 for a little light reading). I have no problems with legal meteorite collecting and I am constantly impressed by the great number of private (non-governmental) meteorite hunters who have chosen to impose severe constraints on themselves where legal frameworks are not clear.

NEW YORK TIMES

The discovery of a rich and historically significant meteorite crater in southern Egypt, just north of the Sudanese border, has shown the voracious appetite for new fragments. Just as scientists appeared on the cusp of decrypting the evidence to solve an ancient puzzle, looters plundered the desolate site, and the political chaos in Egypt seems to ensure that the scientists will not be going back anytime soon.

The mystery began thousands of years ago with Egyptian hieroglyphs, which refer to the "iron of heaven." Archaeologists have long debated whether the Egyptians made artifacts from iron meteorites that fell to Earth in fiery upheavals. The main evidence came from ancient knife blades of iron that had high concentrations of nickel — a rare element in the Earth's crust that was considered a signature of extraterrestrial origin.

But doubts grew as investigators found terrestrial sites rich in nickel that ancient peoples could have mined. And scientists in Egypt never found an impact crater and a nearby lode of meteorites. Then in June 2008, Vincenzo de Michele, an Italian mineralogist and former curator at the Natural History Museum of Milan who had explored the Egyptian desert for nearly two decades, was scanning the area on Google Earth when he saw something unusual.

He told Mario Di Martino of the Italian National Institute for Astrophysics in Turin, and together they formed an expedition that surveyed the site in February 2009. To their delight, the desolate area bristled with iron meteorites — more than 5,000 of them — and they named the crater Gebel Kamil, after a nearby mountain.

The team members signed a note of discovery and put it in a bottle at the crater's bottom. The find was a first. It was the only meteorite crater ever discovered in Egypt — its mouth 150 feet wide — and the team vowed to keep it confidential as long as possible.

But a return expedition in February 2010, found that the bottle had disappeared. The secret was out.

A few months later, in June, meteorites from the crater were for sale at a show in Ensisheim, France. In a review, the International Meteorite Collectors Association called them arguably the world's "most fascinating new iron find." The Egyptian rocks, it added, "received a lot of attention."

RESPONSE

In that review of the Ensisheim Show of 2010, it is also stated that "a lot of decent size shrapnels" were available. According to the Meteoritical Bulletin Database, about 1,600 kilograms of shrapnel fragments have been recovered. I mentioned that fact to Dr. Harvey who expressed surprise at the number: obviously he had not been told that the pieces were that plentiful.

From the Meteoritical Bulletin Database:

<table>
<thead>
<tr>
<th>Gebel Kamil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong> Gebel Kamil</td>
</tr>
<tr>
<td><strong>Abbreviation:</strong> There is no official abbreviation for this meteorite.</td>
</tr>
<tr>
<td><strong>Observed fall:</strong> No</td>
</tr>
<tr>
<td><strong>Year found:</strong> 2009</td>
</tr>
<tr>
<td><strong>Country:</strong> Egypt</td>
</tr>
<tr>
<td><strong>Mass:</strong> 21.6 MT</td>
</tr>
</tbody>
</table>

**Classification:**
- **Meteoritical Bulletin:** MS 25 (2010) |
- **Recommended:** Iron, ungrouped |

This is 1 of 159 approved meteorites (plus 1 unapproved name) classified as Iron, ungrouped. [show all] Search for other: Metal-rich meteorites, Ungrouped irons, and Iron meteorites

NEW YORK TIMES

Popular or not, the meteorites were taboo. In Egypt and elsewhere, scientists say, it is illegal witho
The collectors association, founded in 2004 in Nevada, now has hundreds of members around the world. The pace of collecting began to soar after explorers scrutinizing the dark-colored meteorites stood out against flat, featureless areas covered by sand and fetched high prices. Yet scavengers have disseminated them widely: on Star-bits.com, one of many sites that sell a variety of meteorites, the 10 fragments with rich patinas are said to be from Gebel Kamil. The cost of the 10 — a two-pound rock, just large enough to cover the fingers of a man's hand — is priced at $1,600.

Eric Olson of Star-bits defended the marketing as legitimate and beyond Egyptian law. "I didn't buy them from the Egyptians," he said in an interview. "I bought them second- and third hand." The scientists say they have relatively few samples compared with the booming illicit sales. "We have at our disposal a very limited number of specimens to study and exhibit," said Dr. Di Martino. He and other members of the Gebel Kamil crater discovery team, he added, don't have the money to buy them on the flourishing black market.

Dr. Harvey of Case Western Reserve said the quandary applied to the scientific community as a whole. The rampant looting of meteorite sites and skyrocketing prices for the fragments, he said, "dramatically reduce who can get samples to do the research."

RESPONSE

Let's consider a few facts here:
First, the rule created by the Meteoritical Society: 20% or 20 grams, whichever is less, of a newly-found meteorite is to be sent to a special lab for analysis, classification, and publication in the Meteoritical Bulletin if you want to know what it is you have found. And according to the latest figures, 40,264 have already been published and 12,342 are still being studied. That's a whole lot of meteorites! Also, I was recently told by one meteorriticist that she had "well over a year's worth of work" on her desk at this time. Yes, meteorriticists have been flooded with material and it is not rare to have to wait a year (or more on rare occasions) for a response. Some institutions even had to stop accepting new material. So I would not say that the number of samples for research has been reduced; in fact, what I see, and what I am told by scientists, would indicate a glut of specimens.

NEW YORK TIMES

The black market has exploded in size mainly because of a rush of new meteorites arriving from North Africa and the Arabian Peninsula. Starting in the late 1980s and 1990s, explorers and nomads discovered that dark-colored meteorites stood out against flat, featureless areas covered by sand small pebbles. And dry desert air helped preserve the rocks from space. The pace of collecting began to soar after explorers scrutinizing the sands of Libya discovered a number of meteorites from the Moon and Mars. These rare types formed during cosmic smashups, eventually fell to Earth and fetched high prices.

The collectors association, founded in 2004 in Nevada, now has hundreds of members around the
globe. And while some traders deal in legitimate exports, many do not.

RESPONSE
Since I could be prejudiced when it comes to the IMCA, I will let Geoff Notkin, co-host of "Meteorite Men" on the Science Channel, author of "Meteorite Hunting: How to find Treasure from Space" and hundreds of articles, answer this comment:

"The worldwide community of meteorite dealers and collectors chose voluntarily to form the IMCA (International Meteorite Collectors Association), in order to establish high standards of conduct and ethics; it was not forced upon us. A sweeping statement accusing the IMCA of illegal activities is not only brazenly inaccurate, it is also a malicious insult to the organization's many members who have made remarkable discoveries, and made extraordinarily generous donations to the science of meteoritics. The vast majority of hardworking academics in the field recognize the invaluable, and ongoing, contributions made by those who have a commercial interest in meteorites. Any researcher with a realistic understanding of the meteorite world embraces the opportunity to work with hunters and dealers who regularly bring new and important finds to academia, rather than likening their efforts to the drug trade."

And again a few facts: Officially our association is only a little over 6 years old, and we have presently 365 members all over the globe. And all those members have volunteered to live by our Code of Ethics as condition of membership. Among other things that Code requires of members that they "...agree to abide by all Federal, State and Local Laws and regulations related to the purchase, sale, trade or other related transactions concerned with the securing or disposing of all Meteoritical material." Whether any of those laws is beneficial or harmful to meteorites is an entirely different discussion. Those laws do exist and must be respected.

NEW YORK TIMES
One buyer expressed remorse after reading about scientific angst over the thriving market. "I'm very ashamed," the buyer wrote on a blog. "I'm surely a part of the problem."
Still, many collectors defend the hobby as advantageous for scientists, saying the market is producing many discoveries and creating many opportunities. Amateurs often turn to experts for analysis and authentication and, in return, share the extraterrestrial haul.
"The scientists do not have time to go hunt for their own meteorites, so somebody has to do it for them," said Anne M. Black, president of the collectors association. "It's common sense."
Even some scientists applaud the new market.
"I see it as a good thing on balance," said Carl B. Agee, director of the Institute of Meteoritics at the University of New Mexico. "It's beneficial mainly because of the huge diversity of meteorites not previously known about and not accessible."

RESPONSE
Thank you, Dr. Agee, and I am delighted we finally met this year during the Tucson show. I am sorry you missed Dr. Carleton Moore and Dr. Laurence Garvie from ASU, and Dr. Arthur Ehlmann from Texas Christian University, who are frequent visitors to the Show; as one of them told me: "The Tucson Show! It is Christmas all over again!" And thank you for posting this on two meteorite-forums:

"Since I am quoted in this article, here's my reaction to it. The reporter seems very confused, in that he lumps together a story about the Gebel Kamil crater in Egypt and the legal meteorite trade (NWA) based primarily in Morocco. During the interview with him I spent a fair amount of time trying to explain to him how beneficial the NWA's have been for planetary science research. For example, mentioned how the number of rare Angrite meteorites has more than doubled due to African finds; a huge enhancement to our understanding of the early solar system, and of course I mentioned all the lunars and Martians, and other rare classes. I told him that I was not terribly well informed about the Gebel Kamil crater situation, but in my opinion the highest priority would be to protect the impact structure from degradation as these are quite rare on Earth. I also told him, that the Gebel Kamil meteorites on the other hand, are probably not hard to come by, and I'm sure if I wanted to study one for research, I could get a sample at a reasonable price or even get one as a donation from a collector, which museums benefit from frequently. I did get the feeling that he was hoping to hear something negative from me. As such he ended the interview rather quickly, but said something like 'oh, the NWA meteorites sounds like an interesting story, I need to come back to that at a later time'. So of course I was disappointed to see what mess the final NYT version was."

Yes, collectors and amateurs do routinely help the scientific world. Just a few examples: One long-time collector I know has already made plans and signed an agreement so his entire collection will go to Harvard when he is no longer of this world. Another one has already donated some
rare, valuable pieces to the Field Museum in Chicago. Personally I have loaned rare material I was lucky enough to obtain to Dr. Alan Rubin at UCLA, Dr. Ted Bunch at NAU, and Dolores Hill and Dr. Ken Domanik at the University of Arizona in Tucson. Finally, I called Dr. Laurence Garvie, Curator of the meteorite collection of Arizona State University and Editor of the Meteoritical Bulletin. He was clearly appalled by what he had just read in the New York Times. He promised to write to the Editor, and allowed me to quote him: "Of course! We absolutely need the private sector. Some of the most interesting meteorites, Acfer 094, NWA 500, SAU 493, etc. were brought in by private hunters. Those are meteorites scientists are drooling on. And look at those angrites, we had 2, not counting Antarctica, now we have 15!" He also noted that getting loans is never a problem, "I could get a Gebel Kamil if I was interested, I would only have to ask."

NEW YORK TIMES
At stake for science in the rush for meteorites are secrets of the cosmic bombardment, the development of the solar system and possible clues to the existence of extraterrestrial life. Last month, scientists hotly debated whether a new meteorite study produced convincing evidence of microscopic aliens. As for the Gebel Kamil crater, Dr. Di Martino said it was futile to try to save its otherworldly riches from the looters.
"Considering the social, political and geographic situation there," he said of the remote corner of southwestern Egypt, "it will be completely useless to protect the area" — unless the authorities put in "a permanent garrison of marines and/or a minefield."
He and the team of scientific explorers are still eager to revisit the site, mainly to better date the crater. But they worry that the political chaos in Egypt may further endanger their find. The turmoil has already resulted in the delay and possible cancellation of a new expedition to the Kamil crater and raised doubts about the security of a collection of the meteorites in Cairo. With the secret out, the scientific team announced its discovery in July 2010 and detailed its finding in the February issue of Geology. There, the team hailed the discovery as a potential link to the "iron of heaven" and estimated the impact site as less than 5,000 years old.
Luigi Folco, the expedition leader and meteorite curator at the University of Siena, said in an interview that if the age estimate is correct, "ancient Egyptians living along the Nile could have seen this major event." The craggy rock from space is said to have exploded with the blinding flash of an enormous bomb.
Dr. Di Martino said the allure for amateurs was not the advance of history but the pleasure of owning the latest find. Since it's a new meteorite, he said, "the collectors like to have a piece of it."

RESPONSE
Yes, Collectors take, but they also give, and give a lot.
So, in conclusion, no, the Meteorite Market is not a black or illegal market, it is wide-open, highly publicized and thoroughly legal. Of course, as in any segment of the economy there are a few rotten apples in the mix, but it is also self-policied by an association that, I hope, will keep on growing. And it is a market that is not simply accepted by the scientific community, but is very much welcomed.

Anne M. Black
President, IMCA Inc.

This article has been edited by Norbert Classen
Talbachat n’ait Isfoul is an eight kilogram meteorite found in Morocco twelve years ago this month. The Meteoritical Bulletin database lists it as an LL3. You’ll see it called an LL3.7, too. Sometimes it’s called Tagounite 019. As expected with those classifications it has largish, well preserved chondrules. With a ‘scope we find a variety of things.

The box marks an interesting clast and the arrow points out a large compound chondrule.
The clast is five millimeters wide. It is a dense aggregate of mineral grains and fragments.

A closer look finds many of the grains, large and small, display natural crystal faces, that is, the grains are euhedral.
The compound chondrule stands about three and a half millimeters high. It incorporates at least two earlier chondrules.
Multiple growth stages built up this complex RP chondrule.

A contrast in textures.
A relict grain in the center of a 0.7 mm wide porphyritic chondrule.

Below are a few more shots of Talbachat n'aït Isfoul.
# Meteorite Calendar – April 2011

by Anne Black

<table>
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<tr>
<th>1866 Udipi</th>
<th>1857 Heredia</th>
<th>1805 Doronindk</th>
<th>1715 Schelin</th>
<th>1926 Urasaki</th>
<th>1913 Moore County</th>
<th>1803 L'Aigle</th>
<th>1905 Karkh</th>
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<td>1912 Shupiyan</td>
<td>1921 Starsp</td>
<td>1885 Chandpur</td>
<td>1818 Zaborzika</td>
<td>1946 Uscedun</td>
<td>1903 Jackalsfootein</td>
<td>1842 Milena</td>
<td>1905 Karkh</td>
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<td>1890 Misshof</td>
<td>1935 Sungack</td>
<td>1812 Erdeben</td>
<td>1876 Bowton</td>
<td>1921 Fits</td>
<td>1930 Boriska</td>
<td>1908 Novy-Projekt</td>
<td>1990 Sabra</td>
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These meteorites fell in April but the exact dates are unknown.
Vyatka Meteorite

by Editor

Dark polished surface make chondrules nearly impossible to see. Further the preparer has coated the surface with a plastic, reflections of which can be seen in the lower left quarter. But, the specimen shows the distribution of metal grains often seen in H chondrites, that being numerous grains of small and mostly uniform size.

Vyatka specimen 20. 8 gram thickly cut slice. Ordinary Chondrite H4 found 1992. Kirov District Russia TKW 32 kilos
While working near San Ignacio, Belize around 1990 geologist Jean Cornec was given a rounded black glassy pebble. This stone had been found close to Mayan ruins at Bullet Tree Falls, Cayo district, Belize. The specimen was assumed by Jean to be obsidian until seeing a tektite exhibit during a 1993 visit to the Denver Museum of Natural History in Colorado, USA.

In 1995 Glen Izett would examine this stone and another specimen found in nearby Belizian Mayan context. They would be confirmed as eight hundred thousand year old tektites from an unknown strewnfield.
Similar tektites had previously been described from Guatemalan Mayan excavations. It would be another nine years before a chance encounter with an individual from Branch Mouth Village, just down the road from Bullet Tree, would lead to a small tektite collection and subsequent collection of the first Belize tektites from geological context in nearby soils. Within one year Andre Cho, Director of the Belize National Geology Department and Jean Cornec would log recoveries of these rare stones from two nearby locations.

Photo Credits: Apogee Photography

Links:

THE NEW CENTRAL AMERICAN TEKTITE STREWN FIELD
A NEW TEKTITE STREWN FIELD DISCOVERED IN WESTERN BELIZE
Please support Meteorite-Times by visiting our sponsors websites. Click the links below to open their website in a new tab / window.
Once a few decades ago this opening was a framed window in the wall of H. H. Nininger's Home and Museum building. From this window he must have many times pondered the mysteries of Meteor Crater seen in the distance.

Photo by © 2010 James Tobin