If a meteorite falls in the woods and nobody writes an account of its arrival, does it count as a witnessed fall? Or perhaps maybe this: it was a dark and smokey streak across the sky. Oh, and include a fiery explosion, a fierce whistling, and a cow knocked off its feet! Oh yeah, and that two women had to hug trees to avoid the same fate as the cow.

Everything about the 1766 fall of the Albereto, Italy meteorite is exceptional and normal at the same time. Since the understanding of meteorites as extraterrestrial material falling to earth was still a few years off from 1766, the work of Domenico Troili assembling eyewitness reports as well as a specimen of the stone is even more impressive given that he had no idea what he was really doing. And also of note is that 1) the stone was described as being warm when retrieved from its meter-deep hole, and 2) it was promptly broken up into pieces and distributed about the town (all totally normal, of course).
The Jesuit Father Troili described his single specimen of Albareto as, “Very heavy, magnetic and partially covered by a dark crust that appeared to have been burned by fire.”

Further, under a microscope, Albareto “looked like sandstone with shiny particles of metallic iron and bronzy grains.” The bronzy color was enough for Troili to name the mineral with the Arabic word for pyrite; marchesita.
Troili wrote about the Albareto meteorite in a 120 page tome issued within weeks of the fall with the title, *About the Fall of a Stone from the Air, Explanation*. It was that attempted “explanation” part that missed the mark. But in 1766, who really cares, right?

Preferring a scientific approach rather than a supersitious one, Troili concluded that the stone, “is a subterranean explosion that hurled the stone skyward.” A lightly similar fate awaited the explanation of Siena some 28 years later.
But where the arrival of Albereto really stand out is with the unintentional and sideways contribution Benjamin Franklin added to intellectual mix. It seems that someone powerful who really cared, namely Bishop Giuseppe Fogliani of Modena, did agree that Albereto 1) fell from the sky, 2) originated on the Earth, and 3) had been sent skyward by a natural process. However, Bishop Giuseppe Fogliani vehement parted intellectual company with Troili over a significant disagreement regarding the underlying process that caused all this ruckus in the first place. The Bishop, an apparent fan of Ben Franklin’s work, required a lightening bolt to run the show since that was truly the new *hotness* in science.
Like quantum theory today, we are hard pressed to explain anything or everything without a requisite nod towards the strange and spooky physics of the super subatomic realm. And thus the Bishop’s fondness for the newest science of “Electric Fluids” required, if not demanded, inclusion of electricity in all scientific explanations henceforth.

In specific he wrote, “The soil at Modena is full of the nearby water and that a thunderbolt had driven through the stone, which was metallic, and hurled it into the air while covered by its own flash, so it could not be seen until it fell back down.”
While the academic battle quiedy raged between Troili and the Bishop, time flowed on. A century later, Wilhelm Karl Haidinger further studied the bronzy material that Troili noticed in his initial observations of the Albereto meteorite. Rather than the iron disulfide of pyrite, the material was actually straight up iron sulfide as noted by German mineralogist Gustav Rose. Rose, upon his discovery, named the mineral *Troilite* to commemorate Domenico Troili and his pioneering mineralogical work with Albereto. Haidinger popularized the naming of the mineral after Domenico Troili.

Once the dust of history settled, at least two key features of this tale stand out. First, although Domenico Troili could not comprehend that the Albereto stone came from outer space, his work after Albereto was on earth was exceptional and thus worthy of note identifying Troili as the first person to describe the fall of a meteorite, a pronouncement made by none other than H. H. Nininger himself. Later, (after Rose’s proclamation, but before Nininger was born, of course) Ernst Chladni would be given a similar credit, but in this his following case, Chladni already believed that meteorites were extraterrestrial and thus no cumbersome and awkward terrestrial origin was needed. However, for Chladni, now a cumbersome and awkward exterterrestrial explanation was in the works.
The second consideration of note is that the total known weight of Albereto has swung from a historic high of 12kg to a recent low of 2kg. The reason appears to be the difference between Troili’s 12kg TKW observation-based guess at the time of the fall, to a loose accounting of all available Albereto material in collections presently.

As was recorded shortly after the fall of Albereto, the single stone was “hacked” to pieces. “Hacked?” Splitting semantic hairs? Possibly, but there is plenty of credit to go around without arguing the semantics. But oddly, “hacked” has been used often to describe what happens to meteorites upon arrival to earth. I’m not sure the “hacked” fate awaits meteorites crashing into Mars, the Moon, or anywhere else but here. Perhaps that’s really a feature of us earthlings, not a bug.

Often I must read between the lines, and convert the past into the present in order to better understand and interpret the meteorite falls of the past. With Albereto, so much obvious was in play that the nuances of specific detail are just tasty icing on the intellectual cake. Honestly, the majority of the excitement of collecting historic meteorite falls is found within their stories while at the exact same time one holds the actual meteorite material your own hand. The same material Troili held. And Chladni. And Nininger.

Until next time…. 
It has been a long time since I did an article on cutting meteorites but since that is mostly all I am doing right now it's what I have on my mind.

At certain times of the year as necessity demands, I spend weeks in the lab cutting stones to resupply our catalog. We get a few new stones every year too that I cut, but often I will pull out a stone that I have cut on before and continue taking more slices off. I have sealed containers with desiccant going back many years. I get requests from Paul for more slices or windowed stones of several items and work usually about six hours a day until the pieces are done. It is all pretty routine now after 50 years of cutting both rocks and meteorites. But I remember how it was in the beginning when I was just a kid in my twenties doing lapidary as a portion of my multi-faceted income stream. In those days it was mostly rocks made into gemstones for the jewelry I created to sell at the artist faire on the weekends. But I was collecting a few meteorites even then and had been since I was 14 and visited Meteor Crater. I did not have the money to buy very many. I had made a little saw out of a motor and some pulleys. It used a tiny thin 4-inch opal cutting blade. This claptrap machine worked pretty well and I could have it at my apartment to use at night after my other jobs. I was using sandpaper stuck down to a thick piece of hard plastic and a hand cabochon maker for doing the gemstones. I was on the outs with my parents at this time and had no access to the nice Highland Park combo saw, grinder and polisher over at their house. I had used that machine since I was 12 years old. I still have that Highland Park machine though I have not yet reinstalled it at the new house. But I made the hand operation work and I just needed to make a few pieces a week to have for the weekend. I did the silver work in the apartment too. I used an alcohol lamp with a blowpipe for the silver soldering. Somehow the word got around that I could cut stones and a couple of the meteorite dealers asked me to cut meteorites for them. I took payment in pieces of the stones so I was able to slowly add to my collection without spending any dollars. Rolling time forward a few years I am no longer quite so broke and can do more. I added a homemade lap to the inventory and a homemade polisher. I upgraded to a much better homemade saw that took a 6-inch blade and was much more flexible to work with. I had a place to use the real silversmithing tools that I could not use in an apartment. Things such as my acetylene torch and Foredom handtool. I was doing much more jewelry and cutting more meteorites. I was cutting at least a couple of stones a week for others by this time. Usually, it was just a split down the middle with polishing the faces of the halves but occasionally it was to slice a stone completely up. Last year at Tucson I saw one of these stones in a display case in a dealer’s room. It was half of a Millbillillie and I recognized the old friend instantly as one I cut over thirty-years ago. Funny how sometimes the meteorites just make the rounds from one person to another over the decades and they come back to be seen again.
This is an image of the homemade polisher I made about fifty years ago. I got a double electric blower from a junker and cut off the shrouds turning them into shields. For a couple of dollars each I got the buffer spindles and attached them to the shafts I removed the actual fan blades from and then added two buffing wheels. I wired it up with a switch and cord. I still use this for polishing silver work.

Today I have commercial equipment except for the main saw I use most of the time. It is special and there is nothing as nice on the market. It has dial micrometer adjustments for setting the thickness of slices and a digital stepper motor feed control, recirculating pump and spray jets to direct the cooling water onto the front and sides of the blade. It takes both 6 and 8-inch blades. I turn it on and go do something else while it cuts.

I can make over a hundred cuts a day on the saw if the stones are small. Each cut can be as thin or thick as I want and each can be the same as the rest in a batch with exactness so close you can not feel the difference in thickness if they are laid next to each other on a table. After thirty years of saw designing, I am really happy with this one. The laps are now nice purchased machines. I retired the homemade one when the motor bearings finally got terribly wobbly after twenty-five years. I have a complete lab today with almost everything one could want and when something new is needed I can just buy it nowadays.

But I have not forgotten those years in the past when times were lean. I had a fear-induced healthy respect for the meteorites back then. I needed to cut them correctly and make no mistakes because I had no money
to replace a wrecked stone or a wasted slice. Richard Norton had come out with the first edition of Rocks From Space sometime in this period and made a point that wedged slices were useless and the worst thing there was. So I was not going to make those if I could help it.

This is a finished batch of Lunar NWA11474 that I cut just about as this issue was being put together. It was a much smaller stone than some I have cut, still, the full slices shown are about two inches on the sides. Much larger than the tiny pieces of the Moon we once bought. It was a stone with plenty of fractures in places so I have ample small and tiny pieces for our catalog. The slices were finished through several diamond lapping disks to 1200 grit and then polished on a felt disk with 100,000 mesh diamond powder. Everything is saved with lunar meteorites. I cleaned the saw before cutting anything else so the collected dust would be pure lunar.
Some of the very exotic meteorites of today are cut quite thinly to offer the best price and lowest weight for the biggest surface area. With slices that are so thin, it requires great care to keep from breaking the pieces in the saw. If my saw did not run smoothly it would be impossible to get the slices as thin as what this image shows of a full slice of NWA11474 Lunar in calipers. The dial reads 0.060 of an inch or 1.524 millimeters.

I took the trouble from the very start decades ago to make sure the stones were never exposed to anything that would contaminate them. That is why that old half stone I saw in Tucson still looked good I guess. I still just use distilled water and still soak all the slices in alcohol between stages of work and polish with just diamond, not any other polishes. It is not any more costly and a lot less trouble to polish with diamond. With diamond paste, you seldom recharge the felt disk and it lasts a long time so you use very little.

I always sat down with the stones and sort of introduced myself to them. I examined them for cracks and flaws so I would not get into trouble later and drew lines with chalk on the stones for where I would make my cuts. On bigger stones, I still do that today. I even ask for chalk lines from the two or three people I continue to cut for. I am not taking any new clients or work. But have three friends that I buy and divide meteorites with. The stones are ones we like and want to get classified. We split the cost to buy the stones. I cut off the type specimen and prepare it so it looks good for the lab doing the classification. Then we sit back and wait for the results a few months later. We almost always have something in the works and I feel great to be adding to the knowledge base by sending cool meteorites off to become official. I cut the stones in half usually and send the partnering friend his piece. It always makes for a period of conversation and texting. I would only see or talk to these friends at Tuscon without this extra fun meteorite sharing.

Twice in 2018 I had stones sent to me by friends that told me what the stones were supposed to be only to find after making the first cut that they were something different. One turned out to look like an R Chondrite. So I stopped cutting the slices off and contacted the friend. It was classified as an R3. Very Cool. The other was equally exciting and a nice surprise for that friend. As many have said visual pairing is just not a thing to try and do. It is a snare that responsible meteorite people should never fall into. I have had fun guessing what a stone is as I send it off to be classified. But it is just a fun activity within my mind or a small circle of friends. I have sent off meteorites that I was quite sure would make the cut as type 3 chondrites only to have them turn out as type 4. Many times I thought two stones from a box batch would be the same from their outside appearance only to find when they were cut that they were quite different. They had fooled someone else before me too. I have a pile of stones that I sorted out from big batches of NWA 869 that I
know are not NWA 869. The truth is only revealed by the saw and the laboratory. Field handling of stones is not always as good as it might be and mixing occurs as the stones pass through many hands. This is not much of a problem when the stones are being sold as unclassified ordinary chondrites. If one turns out to be something much nicer no one is complaining. But when it is something unusual like a Lodranite or Acapulcoite or Brachinite then the care in handling is critical and the differences visually are more difficult to see in a small hand specimen.

I try hard to be meticulous about labeling and bagging of specimens as they are handled in my little lab. This week I had 14 different meteorites being worked on at the same time. I will cut for two or three days and then lap and polish for several days until they are all finished. I cut off what I need from one and pack up the surplus, reweighing it for the inventory; writing the weight on the container. I bag the slices or fragments until it is their turn to be worked on again writing the meteorite name on the bag and often including a slip with the name into the bag just for safety. Sometimes the ink on the baggies gets rubbed off a little. Then I take the next meteorite and prepare it for cutting and do the same with its pieces. Lapping and polishing are done on just one meteorite name at a time. I don't make piles or put them in compartment boxes or any of that kind of thing. Piles get bumped and boxes get dumped and meteorites would get mixed. Today I worked on NWA7678, NWA 7454, and NWA4502. They are all Carbonaceous Chondrites. Visually I can tell the NWA4502 from the other two but only clues from the cutting like the shape of slices could be safely used to distinguish the NWA7678 and NWA7454 they are pretty darn similar. It only takes a moment extra to do it in my obsessive way. Today it is hard to even know if the meteorites are different. So many end up being classified multiple times and getting different numbers.

But regardless of how careful you are things happen. We buy stones at gem shows and they are classified and numbered and everything is supposed to be fine and about once a decade I will find a stone in a batch that like the NWA 869s does not match the rest. It goes off to the nice, but unknown stone pile to be sold without pedigree. Paul and I would rather do that than have someone find something funny later about one of our pieces.

It seems to be pretty common for individuals who become interested in meteorite collecting to decide that they also want to begin cutting them. I see posts quite regularly online from new collectors who are now new cutters. Meteorites are not like regular rocks in any way. It is far more than just their point of origin beyond the Earth that distinguishes them as different. They need to be prepared by special techniques using the correct materials or they will be nothing more than a pile of brown goo in a few years. I have had nothing but fun cutting meteorites. It remains far more fun than work even today as I spend much of my retirement working on them. But I have spent 40+ years learning about them, writing about them, and researching them to feel confident that they can survive the abuse I put them through in cutting and finishing them. I would, therefore, encourage anyone jumping into the area of meteorite cutting to do as much learning as they can about how to do the work correctly to maintain the safety of the extraterrestrial material.

Over the years I added thin section making to the list of my preparation skills. I started when I was barely more than a kid making my first thin sections using biology slides that were 1 x 3 inches and which don’t fit my thin section cases of today. I used epoxy from the hardware store which has turned yellow after the decades. I ground the meteorites down on aluminum oxide sandpaper and finished them with the help of a homemade polarized light viewer. I finished them using 1000 grit paper and looking over and over at them in the viewer after ever few strokes across the sandpaper until they showed good interference colors. They were really crude. Well, things have changed a lot with the passing of time. Now I do them with diamond disks and polish the slices that are full slide coverage instead of tiny chips to a bright polish before mounting that side to the glass. The slices are barely 1 mm thick to start with and when they are finished they are almost as good as a commercial slide. I do them in batch but it averages that I can make one in about an hour. I always make them for a meteorite before sending it off to be classified. This gives me a much better idea of what I am sending away and helps make the waiting months go by easier. About a year ago I had a beautiful stone that I wanted to get classified. It was fresh with a nice matrix and packed with distinct chondrules. I was so delighted with the stone when I cut it that I also cut a thin slice just barely one millimeter thick and made seven thin sections from the slice. While all the thin sections were very good three were superior to the others. I posted on FaceBook some micrographs in polarized light of the meteorite. Shortly after the posting, I was emailed by a friend who is my favorite classifier of meteorites that they would love to classify the stone since it had characteristics they could see in my images that were currently part of a research project at the lab. I eagerly said, “Sure of course.” As time was a consideration since some of the research work was due soon. I offered to send one or two of my self-prepared thin
sections so they could save the delay of several weeks in getting their own prepared. My work needed to be repolished with colloidal silica to get rid of the residue from my diamond polishing but my section was used in the classification work. I was just thrilled. That was like coming all the way around from my crap learning experiments of forty years ago to something good enough for laboratory use. I have many stones go through my cutting lab and it is not unusual for me to take a thin slice for thin section preparation. It is always later when I have the time. I think I packed about a dozen mounted slides before we moved and have not gotten the time yet to finish them. But that will make a nice project and give me hours of great photography fun once they are made.

This is an image from NWA11991 showing the clustered chondritic texture that the meteorite has in many places. The photograph was taken from a thin section in the batch of seven I made when the meteorite was first cut.

I have embraced every area of meteorites during my life. They have been a source of knowledge and immense enjoyment. I have merged several other hobbies with the meteorites to enlarge that experience even more. I use appropriately weathered and low-quality stones for jewelry sometimes and tumble the scrap and broken small pieces to enhance them. Paul and I hunt them and find them with friends and by ourselves. I collect them and write about them. I have met fantastic dealers and famous people from all around the world and been on TV talking about meteorites. I give the occasional lecture to groups about them and have cleaned, cut and finished meteorites for some amazing museums and institutions. And of course, made specimens for hundreds of wonderful customers worldwide. I hope the fun will continue. Meteorites are a great hobby and a tremendous opportunity for learning about our solar system. Can meteorites compete against video games and social media for the interest of the next generation? I guess time will tell that. Until the next issue enjoy your space rocks.
Here is part of a batch of cabochons that I made recently to resupply the catalog. Cabochons were one of the first things I made from stone as a 12-year-old kid after my father bought the Highland Park combo unit.
Long-time readers of Bob’s Bulletin might notice a subtle change to this newsletter where we have included “Uncatalogued (but classified)” meteorites to the list of “Orphaned” USA meteorites. It has come to our attention that this subset of undocumented USA finds has been growing larger with each passing year. These are finds that have been made in the USA, and which have been successfully authenticated and classified, but for a wide variety of reasons, cannot get a formally-approved name assigned to them. Consequently, they can’t get formally catalogued. Some of these meteorites can languish as “unpublished” for nearly as long as their poorer cousins, the Unclassified U.S. (UU) Ordinary Chondrites (OC). In order to bring attention to their increasing numbers, this newsletter will be assigning provisional “USA” numbers to those classified USA finds before they disappear (possibly forever) into this meteoritical purgatory.

Now for some good news. We have received a few more small donations towards paying-down the cost of classification for some of the Ordinary Chondrites (OC) that have appeared in these Bob’s Bulletins. Also, now that I have found some “approved classifiers” that are willing to characterize OC meteorites, some finders have come forward with their OC finds, and funds, in order to do their part to prevent their meteorites from perpetually languishing as “Unclassified”.

Now, the task of finding an available microprobe with the lowest hourly rate (and getting access to it) is the constant search.

It is gratifying to see that this problem of U.S. meteorite finds going unclassified, not to mention remaining unreported, is finally getting some attention.

In the meanwhile, I will continue assigning provisional “USA” numbers for classified (but uncatalogued) meteorites, as well as, “UU” numbers for all Unclassified U.S. (UU) Ordinary Chondrite (OC) finds that I can
In order to maximize the time available for submitting these unclassified meteorites for classification, this month’s edition of the “Bulletin” will be kept short. This month’s newsletter will be listing only the recent “classified-but-not-cataloged” USA finds. This is an obvious departure from prior editions, where we listed only “Unclassified U.S. chondrite finds” (UUOC). Although this was the original objective (to get these “orphaned” chondrites classified), this list of unpublished classifications only ADDS the tip of an iceberg of a large number of USA finds still needing to be catalogued, which can only be realized through sustained funding.

*** Note: All of the meteorites mentioned in this month’s article were found by this author. ***

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<th>Weathering Grade</th>
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Example “Classified” Meteorite Specimen Description

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**Macroscopic Description** — R. Verish
This 27.5gram stone is an oriented individual with aft-end having a subtle overlipping. Originally, this stone had a discoidal shape, but a fragment is missing, and now it is shield-shaped with a smooth, brownish-black fusion-crusted exterior. Cut surface shows a mottled, light-brown interior.

**Geochemical Description —** D. Shiekh, FSU

- Olivine, Fa 22.58±0.9 (N=25);
- Orthopyroxene, Fs 19.37±0.9 (N=25), Wo 2.50±0.7 (N=25).

**USA “Classified” Meteorite — Images for Specimen ID# USA150808 (H3-4 S3 W3)**
The above “list” is one way I can show how private donors are funding citizen-scientists and other volunteers, in helping reduce the number of meteorites (found here in the USA) from languishing as “unclassified”. Hopefully, more attention will be drawn to this problem caused by the lack of official funding, and more donors will come forward and help get these “U.S. orphans” classified and cataloged.

Note: All thin-sections are a 1″-round, double-polished, uncovered glass-slide.

I realize that some of the above images have already appeared in previous volumes of Bob’s Bulletins, but viewing them again (now that we know their classification), it is more educational. Also, it is satisfying to the finders, and especially the donors, who funded the analysis, to see their meteorites classified.

In the meanwhile, I will do my part and continue to solicit donors, so that more thin-sections, such as these, can be made and submitted for classification.

References:

Bob’s Bulletin – Vol. 5 No. 1 — In my 13th Bulletin, published the “classifications” for meteorite specimens: USA090312, USA000410, USA140527, and USA150802, which have been submitted to the Nomenclature Committee for name approval.
Bob’s Bulletin – Vol. 4 No. 4 — In my 12th Bulletin, published “Provisional Numbers” for meteorite specimens: UU090312, UU000410, UU140527, and UU150802, which were submitted for classification.

Bob’s Bulletin – Vol. 4 No. 3 — In my 11th Bulletin, I published “Provisional Number” UU180513, which is awaiting classification.

Bob’s Bulletin – Vol. 4 No. 2 — In my 10th Bulletin, I published “Provisional Number” UU180122, which has since been classified and approved as “Willcox Playa 011”.

Bob’s Bulletin – Vol. 4 No. 1 — In my 9th Bulletin, I published a table of six (6) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some finds from four (4) separate localities:

PROVISIONAL # — Field ID No. — Mass — Notes: each stone has had its GPS coordinates recorded.

UU151212V — CA151212V — 129.6g — one of 22 fragments found in a tight cluster by Mark Bittmann, et al, (and this is the 1 fragment found by Bob Verish).

UU160618 — CA160618 — 52.5g — type-specimen cut & thin-section — found by Mark Bittmann

UU170407 — CA170407 — 16.3g — type-specimen cut & thin-section — found by Mark Bittmann

UU161111X — C161111X — 1,075g — sample cut & thin-section; main-mass with Bob Verish

UU161212F — C161212F — 18.25g — type-specimen cut & thin-section; main-mass with Bob Verish

*** Note: The above 6 meteorites represent 4 localities. ***

Bob’s Bulletin – Vol. 3 No. 1 — In my 8th Bulletin, I published a table of sixteen (16) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some finds from an existing DCA, but were refused entry into the MBD:

PROVISIONAL # — Field ID No. — Mass — Notes: each stone has had its GPS coordinates recorded.

UU140705A — CA140705A — 2.0g — physically-paired to UU150110

UU140705B — CA140705B — 8.25g — sample cut & thin-section; main-mass with Mark Bittmann

UU140719 — CA140719 — 8.9g — sample cut & thin-section; main-mass with Mark Bittmann

UU140726 — CA140726 — 4.7g

UU140726B — CA140726 — 15.8g

UU140913A — 1.2g

UU140913B — CA140913B — 3.4g

UU140919 — CA140919 — 5.9g

UU140923 — CA140923 — 8.9g

UU141001 — CA141001 — 8.9g

UU141220 — CA141220 — 2.6g — sample cut & thin-section; main-mass with Mark Bittmann

UU141227 — CA141227 — 1.9g

UU150103 — CA150103 — 11.6g — physically-paired to UU151228

UU150110 — CA150110 — 2.8g — sample cut & thin-section; main-mass with Mark Bittmann

UU150110 — CA150110 — 8.9g — sample cut & thin-section; main-mass with Mark Bittmann — physically-paired to UU140705A

UU151228 — CA151228 — 1.9g — sample cut & thin-section; main-mass with Mark Bittmann — physically-paired to UU150103

*** Note: All of these meteorites were found from a single locality, an officially designated DCA. ***

In all of my previous Bob’s Bulletins, I prefaced each one with an explanation of what I mean by the phrase “orphaned-meteorites from the USA”. I defined “orphaned” as being meteorite “finds” that are recovered in the U.S., but are not being recorded. Contrary to what you may think, these meteorites are being reported, but the finders of these meteorites have encountered resistance in getting provisional numbers assigned to their finds, even when the (obvious) meteorites were recovered from officially designated “Dense Collection Areas” (DCA). These meteorites are being ignored. This is in addition to the current practice by the official classifiers of meteorites to refuse to classify Ordinary Chondrites (OC). Without an “official” classification, meteorites cannot get an officially-approved name by the Nomenclature Committee of the Meteoritical Society, and hence, cannot be cataloged. And hence, uncatalogued meteorites are “orphaned”.

Unfortunately, the vast majority of new U.S. finds are destined to remain orphans.

In my preface I would go on to explain that these “Unclassified U.S. finds” (UU) were being orphaned from the family of “approved” meteorites for the following reasons:

1) The lack of funding for U.S. researchers to authenticate, classify, and document/record these U.S. OC finds has resulted in several new [negative] trends, all which discourage finders from reporting their finds.

2) The increasing trend of commercializing the classification of meteorites by U.S. researchers has priced
U.S. OC finds out of the market, and

3) The increasing trend of U.S. researchers to turn away OC finds, even when finders of U.S. OC meteorites are willing to pay for their classification.

Bob’s Bulletin – Vol. 2 No. 3 — In my 7th Bulletin, I published a table of six (6) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some recent finds:

UU160428-14 UU160428-15 UU160428-16 UU160428-17 UU160428-18 UU160428-19

*** Note: All of these meteorites were found by one person (not this author) – all in one day. ***

Bob’s Bulletin – Vol. 2 No. 2 — In my 6th Bulletin, I published a table of the increasing number of unclassified U.S. meteorite finds and petitioned that crowd-sourced funding be used for volunteers to compile and record these finds for later classification and official-approval, until such time that this function can be properly funded with U.S tax-dollars.

Bob’s Bulletin – Vol. 2 No. 1 — In my 5th Bulletin, I published a table of all the unclassified finds from Coyote Dry Lake DCA that were reported prior to 2007.

Bob’s Bulletin – Vol. 1 No. 4 — In my 4th Bulletin, I reported that several U.S. researchers were volunteering their time and effort to record and publish meteorite falls and finds, such as, Creston and Misfits Flat. I suggested that this method of cataloging newly found US meteorite specimens could be expanded, but the main hindrance is that there is no funding for this kind of effort.

Bob’s Bulletin – Vol. 1 No. 3 — In my 3rd Bulletin, I proposed the idea of an on-line database for these “orphaned” and other unclassified U.S. meteorites. This would have to be an all-volunteer effort, much in the same manner that the American Meteor Society has established the Fireball Reporting System. This database would give finders a central point to report their finds and have a field ID number issued to them. This “Field ID” would reflect which US state and date of find. The function of this database should not be confused with already established processes of getting a meteorite “classified”, which is obviously way more labor intensive and costly.

Bob’s Bulletin – Vol. 1 No. 2 — In my 2nd Bulletin, I went into more detail about why I use the phrase “orphaned-meteorites from the USA”. I focused on the lack of U.S.-tax-dollar-funding and why no funding was going towards the classification of these particular meteorites. In hindsight, I now realize that I should have pointed-out that there is also a lack of funding for just authenticating and recording that a U.S. meteorite has been found. This function should never be confused with “classifying” a meteorite, which is obviously way more labor intensive and costly.

Bob’s Bulletin – Vol. 1 No. 1 — In my first Bulletin, I introduced the phrase “orphaned-meteorites from the USA”. I defined these “orphans” as being unwitnessed-fall Ordinary Chondrite (OC) meteorite “finds” that are recovered in the U.S. Unfortunately, the vast majority of U.S. finds are of this type. I went on to write that these U.S. finds were being orphaned from the family of “approved” meteorites for the following reasons:

1) The lack of funding for U.S. researchers to authenticate, classify, and document/record these U.S. OC finds has resulted in several new [negative]; trends.

2) The increasing trend of commercializing the classifying of meteorites by U.S. researchers has priced U.S. OC finds out of the market, and

3) The increasing trend of U.S. researchers to turn away OC finds, even when finders of U.S. OC meteorites are willing to pay for their classification.

Meteoritical Bulletin: the search results for all provisional meteorites found in “USA” – Published by Meteoritical Society – Meteoritical Bulletin, Database.

If you “Click” on the header titled “Assigned On”, it will change the table to chronological order by date of assignment, and it will show that – SINCE 2014 – there have been no new Provisional Numbers assigned to a find made in the United States!
Meteorites of California the list of formally-recognized California meteorite falls and finds.

My previous Bob’s Bulletins can be found *HERE*

If you would like to sponsor any of these orphans, and help in getting them classified, in order to get them entered into the Meteoritical Bulletin Database, then please contact me by email:

bolidechaser at yahoo-dot-com
On the morning of June 29, 2017 the Serra Pelada meteorite arrived in a gold mining area of Amazonia with a fireball, smoke train, "detonations" and dust. A mass of about 6kg broke apart near a village school and was quickly scooped up and distributed among locals. About 4km east an electrician at a mining company site saw a similar size stone fall. Word spread on local media and collectors appeared.

A local geologist sent a sample to Museu Nacional in Rio de Janeiro where classification work was done. Maria E. Zucolotto was the senior editor of the resultant report. More recently Dra. Zucolotto wrote a firsthand account of the fire that destroyed the museum in September 2018. That article is published in the March 1, 2019 issue of Meteorite Times.

Serra Pelada is a brecciated monomict eucrite. Here are photos of features mentioned in the Serra Pelada report, as we see them, and one clast type that was not mentioned.

Thin section sample, one of four used here, is 20mm wide. Fusion crust on left edge abuts clastic medium grained matrix that extends about 1/4 the width of the sample. Its right boundary with clastic fine grained matrix is somewhat angular. Below we will see closer views of the dark clast at bottom center and the larger dark clast with white laths further right. The small silver mottled clast on the top edge right of center is the final object we'll view. Partially cross-polarized light (PXPL).
Fusion crust with gas bubbles and transported mineral grains over a heat affected zone of the underlying clastic medium grained matrix. PXPL

Clastic medium grained matrix. Field of view is 3mm wide. Cross-polarized light (XPL).
Clastic fine grained matrix. FOV 3mm XPL.

Very fine grained subophitic clast. FOV 3mm XPL.
Coarse grained subophitic clast. FOV 3mm XPL.

Very coarse grained clast. FOV 3mm XPL.
Circular fine grained clast, possibly melt rock. FOV 3mm XPL.

Dark clast. FOV 3mm XPL.
Dark clast. FOV 3mm XPL.

Mineral grain with shock induced planar fractures in three directions. Notice that several grain edges align with the fractures. FOV=0.9mm Plane polarized light (PPL).
Mineral grain with shock induced planar fractures in four directions. Notice that several grain edges align with the fractures. FOV=0.9mm PPL.

This distinctly patterned, uneven progression of optical extinction—as cross polarizing filters are rotated—indicate shock mosaicism in this mineral grain.
Exsolution lamellae in pyroxene. FOV=0.9mm PPL.

Exsolution lamellae in pyroxene. FOV=0.3mm PPL.
Clast of spherulitic plagioclase. This lithology was not noted by Zucolotto et al. FOV=0.9mm PXPL.

Same clast of spherulitic plagioclase as above. FOV=0.9mm XPL.
Clast of spherulitic plagioclase. FOV=0.9mm PXPL.

Same clast of spherulitic plagioclase as above. FOV=0.9mm XPL.
Trinitite. Edeowie glass. Daugistau glass (if you've ever heard of this last one, you are part of a very exclusive brotherhood indeed. This article may well be the first time this material has been discussed in any public venue). These three (there are others, but this is a tale of three glasses!) are all of quite remarkably similar character. They consist of relatively thin plates or spatters of glass rarely in excess of a few cm thick. On the basal surface they fused to the substrate sands or soils. On the top they are commonly glossy, sometimes with bulging, ropy, or plastic flow features, like miniature tongues of pahoehoe lava. In broken profile, all are similarly vesiculated.

But don't suppose that these similarities indicate similar genetic explanations. They all surely involved intense heat of some sort, but no single story works for all three.
We begin with the only one of the three glasses whose story we know with good clarity.

5:29 AM, July 16, 1945. “Fat Man” exploded atop a hundred-foot tower at the Trinity Site, Alamogordo, New Mexico, USA:

Exploding with the force of 38 million pounds of dynamite, a billowing fireball rocketed upwards atop a slender cauliflower-textured mushroom cloud, ringed with outward speeding shock-waves, and flashing with massive plasma bolts. For the most part, it *vacuumed* an 800 meter-wide crater deep into the bedrock of ground zero. The materials sucked into the sun-like temperatures of the fireball were quickly reduced to blobs of green glass, that tumbled about in the white-hot turbulent cloud until spattered out on the ground below as a glistening crust. The blobs fused onto the sand on which they splatted and bubbled slowly, so viscous that bubbles could form but not escape. On steeper surfaces, fingers ran a little, like a thick hot wax.

This is the one glass of the three that we understand with solid knowledge. It took an atomic bomb to make it. Pretty exotic, but nothing compared to the next story!

**Edeowie Glass**
Down under our planet, there is a region about 55 km long and 10 km wide running along the west side of the Flinders Range in South Australia, where discontinuous sheets of glass significantly thicker than Trinitite spot the face of the earth. Some have argued for lightning strike origins, others for some sort of aerial burst like a giant Tunguska. But I’m writing this story, so we’ll talk about my favorite theory: an antimatter bolide! With all the dark matter that astrophysicists see drifting around in space, it has been argued that there is a theoretical possibility of earth being struck by a mass of mirror matter. What would happen? As soon as the antimatter starts encountering atoms of matter on entry to our solar system, it would begin blazing a track of pure energy bursts released by annihilation. In the denser matter-packed lower atmosphere, annihilation would have spawned a searing flash of thermal energy.

Theoretically, one kilogram of matter reacting with one kilogram of antimatter could approach the energy released by the Tsar 27,000 kg bomb, the largest thermonuclear device ever detonated.

Do we have anything on earth that has the earmarks of an antimatter bolide impact? Some would say Edeowie Glass is the best fit. It wasn’t a nuclear blast, so despite its similarities to Trinitite, we need another explanation. Lightning strikes are perhaps the most widely accepted suggestion, but I don’t accept it. We have all sorts of fulgurites from all over the world, and I’m not aware of anything resembling Edeowie. As for a Tunguska-like thermal burst, the linear 55 X 10 km field of distribution doesn’t seem right.

The idea of an antimatter bolide streaking at a low angle across the sky as a bolt of scorching thermal energy is a mind-stretching violation of Occam’s Razor, but at least it’s a fun idea, and I don’t know of anything more plausible at this point, so Ockham may have to hold his breath a while longer.

It even gathers a bit of indirect support from the story of Daugistau glass, the final tale of our three glasses. Here, for the first time anywhere, we present a most peculiar story.

**Daugistau Glass**
We've seen what an atom bomb can do to the face of the earth. We've learned ways to harness that power, but it still has a devastating rebellious streak. We speculated on the character of possible products of an antimatter bolide colliding with earth or its atmosphere. Now, we will imagine the practical applications of matter/antimatter-fueled energy release.

This is a personal story. It began for me in 1992 in a Soviet-era uranium producing region so secret that it is not shown on maps of earlier vintage. When the doors of free enterprise first cracked open, I was sent to the Kyzyl Kum Desert of Uzbekistan, looking for gold. At a place called Daugistau, not far from one of the biggest gold deposits on earth, there was a Russian geological expedition village so old that very large trees were buckling the sidewalks by their root mass. I entered the office of the Chief Geologist of the expedition. By force of trained habit, my eyes scanned the shelves of his office for mementos of the most interesting things in the region. There was still a KGB presence that the locals euphemistically called “Department number one”, and a lot of nervousness on the part of our hosts as to what they could or could not reveal about strategic resources, so we learned to scrutinize museum collections and office shelves for clues regarding ore deposits that had not been described to us. In this case, one window sill held a sequence of glassy (trinitite-like!) objects. After formalities and business matters were concluded and the setting had become social, I asked about the glass, and was told the following story:

“During the cold war, this was a very secret place with a strong military presence. In the 1960’s, there was a period when there were many reported UFO sightings in the region. At the height of the excitement, some kids came running into the Daugistau expedition chief geologist’s office, breathlessly describing that they had seen some sort of aircraft land. Humanoid beings got out and collected rocks then got back in and took off. The kids took the geologist to the place, where they had seen the aircraft blast off, and he found there a glistening elliptical patch of glass about 20 meters long. At one end, the glass was up to 6 inches thick. It tapered off to a feather edge at the far end. Beyond that, there were scattered blobs of clinker glass strewn over the desert surface.”

“We considered everything. The military said they had no role in its formation. Lightning was excluded. There was no elemental signature characteristic of some exotic source and no radioactivity. The children’s story is the only story we’ve got.”

My piece is from the downstream apron of the ellipse, a gift from the Chief Geologist’s window sill collection. Although the locality was not far away, he was reluctant to take us there as he was upset by the way the odd feature had been vandalized by UFO buffs.

**Discussion**

I am imagining that if one were to ask a nuclear physicist: “What is the most extreme source of power we can imagine that has some degree of scientific plausibility?” I would suppose the answer would involve the thermal burst ballooning from the annihilation of matter and antimatter.

So, indulge me the short leap from a consideration of energy derived from the reaction of matter with
antimatter to “best hypothetical interstellar travel propellant”, and we have the story of Daugistau Glass. At Edeowie we boldly speculated on the possibility of an antimatter bolide annihilating in the lower atmosphere. At Daugistau, we find something that looks quite similar where kids said they saw some sort of a spacecraft take off. There, the glassy remnants are limited to a dimensionally small area, but the intense heating event was apparently highly focused. Although an order of magnitude smaller than the Trinitite atom bomb crater, the glass was up to an order of magnitude thicker at the proximal end of the ellipse! Was it the product of technologically controlled mutual annihilation of matter and antimatter? Was this the propellant for interstellar (or intergalactic?) travel? How would one fuel a warp-drive propulsion system?

“They’re coming to take me away ho ho ha ha he he, back to the funny farm where life is beautiful all the time and I’ll be happy to see those nice young men in their clean white coats and they’re coming to take me away, ha ha!”

A glass of three tales, indeed!

Epilogue

Lest this article should signal the end my reputation as a serious scientist, I will toss a conciliatory bone to dear old William of Ockham. There probably is a simpler explanation.

Years ago, we obtained a fragment of what appeared to be typical Trinitite, but is was much thicker than any specimen known to me, something in excess of 3 or 4 inches. It generated a lot of interest and discussion amongst Trinitite enthusiasts, and it was ultimately concluded by most of us that it was not Trinitite at all.

At the Alamogordo White Sands research facility there was work underway on things other than nuclear weaponry. For one, rocket engines were being developed and tested, sometimes anchored to stationary bases in order to better measure and observe performance parameters. Such relatively intense and sustained mega-torches reduced the desert sands—the same desert sands that Fat Man melted—to thick puddles of Trinitite-like glass.

Returning to the Daugistau case, I am sure that neither William of Ockham nor most of the rest of us would find it hard to believe that the cold war era soviet military might be less than forthcoming about secret test work undertaken out of sight of prying eyes deep in the highly classified region of the Kysyl Kum Desert. The asymmetrical puddle of glass sounds just right as the product of a test burn of a rocket or missile engine directed horizontally from a fixed position.

If I had to place my bets, this is where I would put my money, but it is not nearly so much fun as an antimatter-fueled UFO!

Deep enough.
The farmer who witnessed the fall of Shergotty prays over the impact hole. “Shergotty” is written in Sanskrit around the Hindu god of the sky, Varuna. Painting by Dorothy Norton.

“I at first doubted whether it was a true aerolite or not, in consequence of the colour being different from the one that fell in the Furreedpore District in 1850... but I find from Mr. Peppe, the Sub-Deputy Opium Agent, that there can be no doubt of its being a true aerolite, as he has seen two that fell in the District...”

This account is found in a deposition submitted in late 1865 by W.C. Costley, Deputy Magistrate of Shergotty, India to his supervisor A. Hope, Magistrate of Behar.

Had Mr. Peppe not been in the neighborhood that day to oversee the opium crop, perhaps W.C. might have tossed the “wrong-colored” rock into the River Ganges.

The deposition was accompanied by an aerolite, and both were presented to the Asiatic Society of Bengal by S.C. Bailey, Officiating Secretary to the Government of Bengal, during their meeting of December, 1865. He also gave them communication No. 829, “with enclosures from the Commissioner of Patna, containing some particulars connected to the fall of the stone...”.

The nearby city of Patna was the British government’s opium processing center for product bound for China.
Bailey was fulfilling a government edict hoping, “… your Society will be good enough to cause all the particulars of interest connected to this Aerolite to be communicated to the authorities of the British Museum.”

That was code for “send the rock to Story-Maskelyne, Keeper of the Minerals”.

**Theater from the Sky**

The farmer’s field where Shergotty landed was just a gritty corner of a grand stage stretching from somewhere on Mars to London, Calcutta and Shanghai. The actors you will meet in this performance filled roles both memorable and execrable.

Before the lights dim, let’s open the playbill and review the literature regarding the fall of Shergotty.

The *Calcutta Gazette* was quoted in the August, 1866 *Report of the 36th Meeting of the British Assoc. for the Advancement of Science*, “A stone fell from the heavens accompanied by a very loud report, and buried itself in the earth knee-deep. At that time, the sky was cloudy and the air calm, no rain. The stone has been forwarded by the government to the Asiatic Society of Bengal.”

The Costley deposition and aeolite are mentioned in *The New Englander, New Haven and Yale Review* vol XXVII, P. 134, 1868.

Referenced in “*The Academy and Literature*” vol.2, p 540, 1871, an analysis by Dr. F. Crook in 1868 purported to be of Shergotty is discovered to be of a specimen from another fall.

On February 22, 1872, Von G. Tschermak submitted the first analysis of the achondrite writing of its recovery, “There is no information on the accompanying circumstances.”
Shergotty is found to the south in this map of Bihar, India

Most recently, Charles Meyer’s (NASA) *Mars Meteorite Compendium* relates, “The Shergotty achondrite fell on August 25, 1865 at 9:00 a.m. near a town called Shergahti in Bihar State, India after detonations were heard (Graham *et al.* 1985). Duke (1968) refers to several stones with fusion crusts, but this has not been confirmed.”

But the 1865 Costley account was the missing Rosetta stone, archived somewhere in the British library.

In this issue of the *Meteorite Times*, almost one-hundred and fifty-five years after the fact, you will read the first complete description of the fall of Shergotty, the namesake of the largest class of meteorites from Mars—shergottites.

But before we discover how Shergotty was saved from the meteor-wrong pile by a government-employed drug dealer, it’s imperative to understand the political and cultural environment of the era surrounding this event and examine the key role India’s first scientific associations played in revolutionizing historic attitudes.

**The Asiatic Society of Bengal Births a National Collection of Meteorites**

Sir William Jones (1746 – 1794) founded the *Asiatick Society* in Calcutta on January 15, 1784, advising
thirty European invitees, “The bounds of investigations will be the geographical limits of Asia, and within these limits its inquiries will be extended to whatever is performed by man or produced by nature.”

What evolved into *The Asiatic Society of Bengal* became instrumental in collecting and studying meteorites. First, those from India, then others acquired in exchange from around the world, breaking an intensely competitive duopoly formed by the British and Vienna museums. Shergotty became one of the first Indian meteorites not to be wholly and dutifully transported by the British bureaucrats governing India to the Natural History Museum in London.

For fans of trivia, besides the Shergotty meteorite fragments and the report of its fall, other gifts to the Society during the fateful meeting included:

- a “brass image of the Dhurm Rajah of Bhotan”, a populist leader worshipped by the *Bhooteas* (Bhutanese). The statue was “preserved from destruction” when the British captured a fort on the frontier of India.

- twelve copies of “a brief analytical review of the Administration of Lord Mornington, afterwards Lord Wellsley.” and lastly, “from Babu Rajendra Mullick, a dead Gayal.”

A gayal was an oxen never put to work, treated well, then slaughtered and eaten.

Society founder Jones was not born into wealth even though his father was the mathematician who devised the symbol for $\pi$. William graduated from Oxford and became a recognized “Orientalist”, writing history books and articles about past Asian societies. Preceding the American Revolution, Jones journeyed to Paris and met with Benjamin Franklin, but was unable to negotiate a work-around to the Colony’s’ demands. Assigned to Calcutta, he sat as a judge and was knighted for his service.

After Jones’ death, the Asiatic Society opened India’s first public library in 1808 and the country’s first public museum in 1814. In 1829 the Society integrated, opening its membership to Indians.

Libraries amass books and papers. Museums amass collections of objects. The pursuit of these needs resulted in the end of England’s colonial practice of harvesting every object of historic or scientific value from the sub-continent for its own institutions.

By the time of the fall of Shergotty in 1865, the Society was India’s most influential scientific organization, their publications in demand by scholars in Europe. Besides those who sought to belong to this group, the Asiatic Society increased its prestige by offering honorary memberships to influential persons in Europe. Some members of note included:

- Major H.H Godwin-Austin, famed for performing a difficult topographical survey of India, he had the world’s second highest mountain (now called K-2) named after him; W.J.Herschel, the son of the astronomer, who realized fingerprints could be used for identification; Allan Hume, the ‘father of Indian ornithology’ was the founder of the Indian National Congress, the country’s powerful political party; Isaac Newton; Charles Darwin; H.R.H. the Duke of Edinburgh.

**Meteorite Legends of the Sub-Continent**

Meteorites have long influenced Indian culture.

One story tells of two merchants who offer Buddha food and request a souvenir to commemorate the occasion. He gives them a hair and pieces of his nail clippings. Buddha tells them that should a stone fall from the sky, they should erect a pagoda on the site and worship the hair and nails as if they were Buddha himself.

In 1867, a meteorite fall of many stones near a small town in India causes the local people to suspect they are objects of vengeance from an offended God. They gather the fragments, pound them into dust, and throw the pieces into the wind.

Concurrent with the fall of Shergotty is a report of “meteor stones which fell in this Talook” near Bangalor on September 21, 1865. After describing the angle of incline, the witness Mahamed Ali investigates whether the stones were put there by villagers maliciously attempting to alarm their neighbors. Because no similar
colored stones are nearby, he is convinced that they are meteorites.

Kenda, another eyewitness, is picking grass only 200 meters from where one of the stones fell. He had heard the "report of a cannon fired three times" before watching something fall from the sky. He was "extremely terrified, his eyes were closed up from the rush of the smoky dust which rose directly after the fall of the stone, he did not go close to it, because he thought that some calamity had descended from the heavens." Kenda eventually took yet another eyewitness to the spot were they found something black, half of which was buried in the sandy soil of the field.

“They touched it with a stick. When they found it was safe enough, he took it out of the hole with his hands and brought it to the village.”

It was turned over to the authorities. That meteorite is Maddur L5, two specimens with a combined weight of about two kilograms remain extant.

We also have an account by Bakerooddin Shaikh of the fall of Gopalpur, a stone donated to the Asiatic Society earlier in 1865.

“I had been to the field to fetch home my cattle. All of a sudden a hissing noise… the sound was like that made by the flight of a buzzard. I saw something dark falling on the earth… we picked up the stone, it had buried itself seventeen or eighteen ungoollies (15”) deep under the ground. The stone was not visible from above the hole. I could feel it with a stick. When we picked it up it was warm, not very hot. I picked it up after it had been in the hole for about one dundo, or the time occupied by walking eleven russees (400m) for a khunta, which had to be brought from a neighboring house before we could dig it up.”

An additional account of the event by Alif Shaikh ascribes mythology to this H6 specimen of 1.6 kilograms. “Bakher kept it in a new earthen pot as something extraordinary. We did not make poojah (an offering) to it, we knew not what it was, but as Hindus have several idols, we thought it must be one of them.”

Introducing Adversaries
Thomas Oldham and Nevil Story-Maskelyne

By the 1800’s, England, under the auspices of the East India Company, treated India as private property, managing its resources and establishing and controlling its civil service with a spirit of benign condescension. The sun would never set on an independent India. This style of organization extended to the scientific community, their various disciplines headed by British nationals.

But with the advent of the Asiatic Society, then of the Geological Survey of India (GSI), a change came about. The British colonists heading these organizations realized that they were qualified researchers capable of studying the material at hand. With the opening of India’s first museum in Calcutta, it was felt that items collected in India should remain in India. This included meteorites.

India was considered an unequaled venue to observe falls. Clear skies and a dense population allowed for multiple observations of a single event. As soon as a meteorite fell, researchers, government officials, even the police were sent to retrieve specimens. All haste was made to collect pieces before the indigenous population had a chance to worship or destroy the meteorite. Witnesses were interrogated as if the strewn field were a crime scene, leaving behind observations both accurate and dubious but an excellent historic record of the times.

These depositions, often coerced under threat, led to recovery of specimens that would otherwise have been lost. Government officials, both British subjects and their Indian counterparts, were strongly encouraged to collect fallen meteorites and take depositions.

The first Indian meteorite to enjoy this complete cycle of observation, deposition and recovery was Akbarpur H4, with 1.8 kg recovered in 1838.

The person most instrumental in acquiring, studying and curating India’s meteorites was Irish geologist Thomas Oldham. Beginning in 1851, Oldham elevated the Geological Survey of India from a collection of papers filling a shoebox to a world-class organization. His countryman Joseph Portlock once said, “I have found him possessed of the highest intelligence and the most unbounded zeal.”
Both the GSI and the Asiatic Society worked to earn a reputation for professionalism and built important connections with researchers and museums throughout Europe and America, much to the chagrin of the British, who believed they owned a monopoly on the study and ownership of all important Indian natural history objects.

Oldham successfully cultivated a relationship with meteoriticist William Haidinger of the Imperial Geological Institute of Vienna, even hiring Austrian geologists to work for the GSI. But no mention of meteorites appeared in the GSI literature until 1865 and all Indian meteorites not yet forwarded to England remained with the Asiatic Society. Oldham was focused on the regions’ coal reserves and fossils.

While the right to maintain a collection of meteorites in a proposed national museum in Calcutta was a concept gaining popularity, a larger movement was afoot. Many levels of Indian society were growing weary of British dominance.

The first instance of Indian independence was manifest in 1857 when a series of unrelated religious and duty issues sparked spontaneous mutinies within the mixed ranks of the military. For a brief time, small areas within India returned to autonomous rule.

And with these successes, landowners, discouraged by limited social and business opportunities while suffering from outrageously high taxes – 60% to 90% of the “gross produce of the soil” – were encouraged to take up arms.

During a disorganized rebellion, atrocities were committed by both sides. When British troops regained control they sought vengeance. Indian captives were tied to the front of cannons and the fuses were lit. Such stories of unspeakable retribution were received back in Britain as justified revenge.

The East India Company was dissolved in favor of the powerful British Raj (reign in Hindi), and Queen Victoria ruled the land. She wrote of her “feelings of horror and regret as the result of this civil war” and felt that by India becoming part of the Empire, this “should breathe feelings of generosity, benevolence and religious tolerance”.

While the British blamed Muslims for instigating these rebellions, they blamed themselves for trying to institutionalize economic schemes that destroyed the fabric of Indian culture. They now installed policies inclusive of India’s former political hierarchy while simultaneously opening universities and educating an Indian elite less influenced by the past.

But coincident with Victoria offering opportunity and equality to her Imperial subjects, Nevil Story-Maskelyne was being appointed Keeper of the Minerals for the British Museum. Someone forgot to copy him on her message.
Keeper of the Minerals, Nevil Story-Maskelyne

Story-Maskelyne’s efforts to grow the National Museums’ meteorite collection to be the world’s largest were uncompromising. Proclaiming that he and his staff could best study and curate meteorites, his papers reflect an attitude akin to divine authority. He would claim for Britain everything that fell out of the Bengal sky, “Meteorites have no nationality.”

He and Thomas Oldham were soon to become well acquainted.

The Meteorite Wars Begin – Colonial Calcutta v Imperialist London

In his seminal paper, “Science and politics of colonial collecting: the case of Indian Meteorites 1856-70”, Savithri Preetha Nair writes, “Story-Maskelyne employed a multi-pronged effort to acquire Indian meteorite specimens in the early 1860s by using science as an alibi to perpetuate an unequal exchange economy. To enhance its national collection of meteorites, the British Museum, represented by Story-Maskelyne, influenced the Government of India to control the activity of meteorite collecting through coercive and legislative means. Collectors, magistrates, police inspectors and medical officers were all enrolled in this extensive collecting network.”

The British Museum Trustees urged the Asiatic Society “to cooperate in improving the National collection… which is only one or two points inferior to that in the Imperial Collection (Vienna)”, and was told to give up its duplicate meteorites, limiting the Society’s ability to trade these for others. For best effect, meteorites would be skillfully sliced in London, not hammered apart in Calcutta.

Acting quickly after his appointment, Story-Maskelyne was able to convince England’s Secretary of State for Foreign Affairs to direct the government of India to turn over all meteorites and depositions to the British Museum. Parnallee LL3.6 and Dharamsala LL6 were the first meteorites to arrive in London under this decree.

After slicing, the Natural History Museum retained twenty-eight pounds of Dharamsala.

One pound was returned to the Indian Museum.
Story-Maskelyne’s exchanges were unashamedly one-sided. He received three pounds of the Bustee aubrite and twenty-four pounds of Yatoor H5 from the Asiatic Society while returning to the Society mere ounces of both.

In 1861 and 1862, the Asiatic Society responded to relentless requests from Story-Maskelyne and sent off eight more meteorites. The British Museum would cut them after preparing casts, and specimens and casts would be distributed to Calcutta and Vienna. Again, the returned “gifts” were modest.

Even the recent advent of not-so-rare-after-all NWA meteorites being traded by dealers for European museums’ prestigious, historic specimens pales besides Story-Maskelyne’s ultimate coup.

An eager, new British governor of Madras would send the entire mass of Parnalle to London in return for a cast.

When Story-Maskelyne heard this news he was ecstatic. To seal the deal, he threw in “two or three good specimens of duplicate meteorites both of iron and of stone”. The museum in Madras was left with a fragment of Parnalle weighing about three ounces while Story-Maskelyne had acquired the main mass of 130 pounds.

His research on acquired material was not without results, and his other achievements were notable. He developed the reflective light microscope and opened the science to the study of opaque minerals. This directly helped him discover the mineral enstatite in Yatoor H5. Then in 1862 he named a new mineral in the Bustee aubrite ‘oldhamite’, his intent in honoring ‘competitor’ Thomas Oldham unknown.

But Maskelyne also seemed focused on accumulating as much material as possible, and tripled the meteorites in the national collection.

Now he grew discontented even with the depositions taken from eyewitnesses. When four separate named meteorites were later found to fit perfectly together, he demanded a review of the fall ten years after the fact. George Osbourne, a government official in India, blamed the shoddy reporting on shifting assignments for those in charge, worsened by the rebellion of 1857-1858. Another official blamed errors in the depositions on the “apathy of Natives and their natural carelessness in noting such events”.

In 1863, Story-Maskelyne transmitted revised instructions to the responsible agencies in India, a precise methodology for preparing depositions and collecting aerolites, all for the benefit of the National Museum in
The friction between Oldham and Story-Maskelyne ignited in 1865. Oldham, using his influence as head of the Geological Survey of India, convinced the Indian government to purchase a collection of 223 meteorites from a mineral dealer in England. Upon receipt, India’s meteorites rivaled the collections of Vienna and London as defined by the number of specimens.

Following a proposal by the Asiatic Society, the Indian Museum opened in Calcutta in 1866. The substantial Society holdings in materials biological and mineralogical had found a home and were merged with the GSI mineral and meteorite collections. Shergotty was among the objects transferred to the new site.

Oldham grew bolder. He rewrote the protocols for preparing depositions and collecting aerolites authored by Story-Maskelyne. Oldham requested that new falls be brought to Calcutta “for distribution” to other institutions.

In 1867 Oldham toured European institutions on a fact-finding mission, realizing that his compatriots doing research in India were as qualified as their European peers.

When Oldham returned home, he and the trustees of the India museum turned the table on Story-Maskelyne making a gift of four meteorite fragments, including Shergotty, to the British.

Story-Maskelyne did not hesitate to publicly rebuke Oldham. In a letter, he made it clear that in the future, Oldham would not be ‘selecting’ anything. There would be no more ‘gifts’, all meteorites would be sent to London where researchers’ abilities surpassed those stationed in Calcutta. Properly cut specimens might be returned as presents to India.

And exhibiting pettiness, he explained that the collection the GSI purchased from the English mineral dealer was unimportant since it only consisted of small examples.

Documents reveal that Story-Maskelyne had negotiated to acquire some specimens of that collection and was outbid at the last moment when Oldham’s group purchased it all.

The nefarious superintendent of the British Museum (National History) Richard Owen approved of these demands, calling it “a great moment in the elucidation of one of the most interesting and obscure problems of Meteorology and Mineralogy’. Owen is best remembered for denouncing the theories of Charles Darwin.

The Asiatic Society didn’t feel Story-Maskelyne’s remarks worthy of comment and ignored them except to suggest that “good science could come from small specimens”.

Their reply maintained that were India to hand over all its meteorites to the British, there would be no incentive for anyone to collect them. The India Museum’s trustees sought “a museum worthy of the Capital of India and a center from which a knowledge of the natural sciences, and interest in their pursuit, may radiate throughout the land”.

In the concluding acts of “The Rise of the Raj and the Fall of Shergotty” you will become a tourist in 19th century Shergotty, Bihar and visit the meteorites’ strewn field, enhanced by an illustration by Dorothy Norton, where the identity of the man who witnessed the fall will be revealed.

Von G.Tschermak’s discovery of a new mineral and the more recent discovery of seifertite in the meteorite will be discussed.

We will detour to Mars at Rover site Meridiani Planum to meet Shergotty’s cousin, Bounce.

The final curtain will fall after an agent of the British opium trade saves Shergotty, adding this tale to the ranks of meteorites’ greatest legends.
Kevin Kichinka meditates among the mangoes, due south of Aguas Zarcas, Costa Rica.

“Om mani padme hum…”

MARSROX@gmail.com.
A Hunting Trip To Xishuangbanna
Bofang Li

June 1, 2018, is destined to be an unusual Children’s Day. My friends’ circle on WeChat is filled with pictures and jokes about pretending to be young and then begging for Children’s Day gifts. Nothing changed until 10 p.m. when a message came in.

The message was sent by Tang Yao, a reporter from a Beijing local newspaper. She interviewed me on September 2017 due to the fireball event that happened during the night of the mid-autumn festival in Shangri-la, Yunnan Province, and keeps in contact with me since then. The message this time containing a short video, which is also a meteor fireball taken about 17 minutes ago in Jinghong City, Xishuangbanna Dai autonomous region, Yunnan province.

Above is the video regarding the fireball and early found meteorites

The video is about 10 seconds long and was taken alongside a river with a very noisy background environment. When it comes to the 4th second of the video the sky suddenly brightened, and a white-colored fireball with a flaming tail passed through the cloudy sky at a very fast speed, and then vanished within 4 seconds. From the diameter of the fireball, the length of the tail, the moving speed, and the intermittent light waves during the final stage of the luminous flight caused by the sound-barrier tremor, I am sure this is a typical meteorite falling event.

Above are the pictures of the fireball

I told Tang Yao that the fireball should be caused by a meteorite fall, and then she asked me if there are any chances to find the meteorites. I thought for a second and then told her: Xishuangbanna is a mountainous and forested area unless the meteorite fell in a human lived place, otherwise it is very difficult to do the searching. However, I could not imagine that the word “unless” in the extreme case of my reply has come true.

Early on the morning of June 2th, when I woke up and opened my mobile phone to check the new updates of my Wechat friend circle, I found several of my friends shared a video of a meteorite. In the video, a man is holding a chipped meteorite. The meteorite is very fresh and by viewing its broken surface I believe it should be a chondrite. The video was shot from a downside view, and the photographer was surrounded by several other people, most of them were wearing slippers and speaking a south-east Asian like language. I asked the friends who shared the video, but no one knows where the video was originally from.
Above is the early found meteorite by the local people

I then forwarded the video to Tang Yao, working in journalism for many years she has the resources to deal with this kind of thing, and several minutes later she found a professional who knows the Southeast Asian dialect very well. The feedback from the professional says that the language in the video is from the Dai people, an ethnic minority living at the Chinese and Burmese border. Remembering the video of the fireball appeared in Xishuangbanna Dai autonomous region a day ago, I began to be excited. In China, a witnessed fall meteorite will appear, on average, 1 or 2 years per time. And the last witnessed meteorite shower happened already over 6 years ago in Xining. That is to say, there is no way for me to give up such an ideal opportunity to hunt for fresh meteorites!

From the June 1st fireball video, I know that the photographer was facing to the west direction. And by using the building inside the video as a referential object, the fireball should be flying in the direction from SEE to NWW by the falling angle of 60°. According to my experiences, the intruder will suffer more pressure as long as it dived into the atmosphere in the opposite direction of the earth’s rotational way, as a result, it will lead to more explosions, and then more fragmentations. Thus, in more chances, it will be turned out a meteorite shower.

On 9 am June 3rd, one of my meteorite friends sent me some photos and short videos indicating that there are already several collectors arrived at the meteorite falling areas. According to the video, it seems there are at least 7 or 8 meteorites had been found, weighing from 20 to 150 grams each. A broken piece shows some shock veins and impact melt pockets, which are conspicuous in contrast with the white-colored matrix, but there is no obvious chondrule. From that characteristics, I reckon the meteorite probably is a L6 chondrite, and the shock stage should be no less than S3.

The last time I was chasing a meteorite shower was in Feb 2012 in Xining, Qinghai province, and cannot restrict my excited feelings to prepare the luggage and book the air tickets to hunt for the new one. However, it is already 4 pm at that point and there are no planes that can reach the Xishuangbanna airport during the rest few hours of the day. Then I flew to Kunming, the capital city of Yunnan province at 9 pm, then waited in the airport for the whole night, and transferred to Xishuangbanna in the early morning of June 4th. I went to the Mengzhe town by taxi, and transferred to a rental motorcycle, then rushed to the strewn field villages.
Above is the meteorite falling locality after rainfall with a rainbow

The first village I arrived in is Mankailong, which is about 5 km from Mengzhe town. I walked into the village on 10:30 am, then a local woman comes close and showed me a newly found meteorite. I noticed some mud and water stains on the meteorite surface and then asked her if the meteorite was found in the crop fields. She can understand my standard mandarin, but I cannot understand her local dialect, so she acknowledged my judgment with a nod. I asked her how much she wants to sell, and one of the onlookers asked me "how much you can offer" as the reply. According to my experiences in this condition, the chance to make a deal is pretty low, then I shook my head and walked towards the crop fields.

Outside the Mankailong village there is an earth road leading to Manlun village and Manlei village, flanked by rice fields and sugarcane fields. As the rice plants are closely spaced and fulfilled with water and mud,
as the result most local people were gathering in the sugarcane fields to search for meteorites, and exciting hurrahs of finding a meteorite can be heard occasionally. I eagerly went down the field ridge to check the newly found meteorites, and the local people were also gathered around me to show their treasures. I saw at least 20 meteorites at that time weighing from 40 to 180 grams, and the villagers told me all of the meteorites were found within a square kilometer area. According to the number and size of the meteorites, I think this place is probably the dense area in the strewn field. Considering the flying direction of the fireball, I reckon in the SE direction there should be more meteorites, but smaller in size; and in the NW direction the number of the meteorites should be less abundant, but in a bigger size.

Above is the earth road from Mankailong to Manlun village

At that time, a black SUV stopped and 2 young men walked out. They said they were coming from Manguang village, which is 2 km on the SE direction from the sugarcane fields, and there are also 2 meteorites landing on their roof tiles. They showed me a 5g meteorite with dark fusion crust, which is fresher a lot than those found in the sugarcane fields.

As later that day, Tang Yao, the news reporter, will come to the meteorite falling place and arranged an online live broadcast with me together, and I must take the limited time to visit as many of the meteorite
landing places as possible to provide the accurate information to the audience. So I gave up the chances to search the dense area in front of me and followed the young men to go to Manguang and the adjacent villages in the next hours. I stopped at the villages of Manguang, Manyangnan, Manpan, and Manmedai, and viewed at least another 20 meteorites all weighing under 30g each. Since the local people have not started to search in the rice fields, there are not many meteorites as I imagined at that time. Based on the above information, I believed that the Manguang village should be the tail of the strewn field. A few days later, however, it turns out that the Manguang village is far from the beginning of the strewn field.
Above is the writer at Manyangnan village

The online live broadcast began at 5 pm. First of all we take place on the earth road between Mankailong and Manlei village to report the people searching meteorites in the sugarcane fields; then we move to Manlei village, there a meteorite crashed into the house roof of Yu Ershuo’s home, and finally we transferred to Manmedai village to visit Yan Wennan’s home.

![Image of writer at Manyangnan village]

Above are the meteorite fragments and the pigsty roof had been hit

Yan Wennan is a 40-years-old local peasant, his family income mainly relies on agriculture planting. When the meteorite shower happened he was lying in the room, and heard noisy detonations and a thud inside his yard. He thought it might be someone throwing a brick fragment into his yard by a stupid behavior. The second day early in the morning, he found the asbestos roof tile on the pigsty was broken, and some stone fragments with partial dark crusts were littered in front of the pigsty. Judging from the circumstances, Yan Wennan thought it might be a stone falling from the upside and hit the asbestos tile, then knocked the cement ground floor, as a result, the tile broke and the stone fragmented. During the next few days, the meteorite shower news spread to the local villagers by their Wechat chatting groups, and by viewing the photos on Wechat groups Yan Wennan acknowledged that he got a meteorite landing on his pigsty too.

![Image of meteorite fragments and pigsty roof]

Above is the video taken at Yan Wennan’s home

I met Yan Wennan at the grocery store in Mankailong village and he told me the story of his pigsty roof tile which was hit by a meteorite, then he showed me a local coarse cloth wrapped bag. I opened the bag and some meteorite fragments came to the light. The fragments are as fresh as the piece from the young men of the Manguang village, however, Yan Wennan’s fragments are covered with the bubble fusion crust. So I know this guy is lucky enough to have an oriented piece hit his pigsty roof, unfortunately, the meteorite was fragmented. After a few minutes of negotiation, I purchased Yan Wennan’s roof crusher fragments, and the asbestos tile hit by the meteorite was also included.

![Video of Yan Wennan's home]
Above are the meteorite fragments and the pigsty roof had been hit

I stayed at a hotel in Mengzhe town during the night and came to the strewn field again early in the morning on June 5th. The meteorite falling place is on a plateau at the altitude of 1800 meters, and the air is very clear, as a result, the ultraviolet is pretty strong. I come from the famous air polluted Beijing and do not have any idea regarding ultraviolet protection. After hanging outside for the first whole day, my neck, arms, and other exposed skin were seriously sunburned. When I sheltered in Mankailong village to avoid the daylight sunshine, I found some villagers trickled into a neighbor’s yard. As the people were a little bit crowded there, I also walked into the courtyard to see what had happened. It turns out that a local businessman was buying meteorites there. After bargaining for a while, he paid for an 86g individual for over 24000RMB (equal to $3700), which is already exceeded the current gold price. According to the price he spent and the meteorite he selected, I guess he is not an experienced collector. However, it is a good beginning for both the meteorite finders and the buyers, as the meteorites can be realized at a high price and the buyers can purchase some samples after all.
In terms of national tradition, the Dai race is water-loving people, and they like to live alongside the rivers or lakes. In the Xishuangbanna region, each Dai village will possess a water-well covering with an ancient tower on it, which they called the tower-well and is usually the same age as the village. They use the well water to cook, drink and also for celebrating their Water Sprinkling Festival. The tower-well in Mankailong is located at the eastern entrance of the village, close to a brook which flows from the northern mountain areas. During the first several days, the local villager Yu Erjiao was searching for the meteorite with her
neighbors in the sugarcane fields, but she had found nothing. On June 5th, when she walked pass by the
tower-well, she suddenly noticed there is a meteorite trapped in a gap on the NW side of the tower-well. I
heard the story in the afternoon of the same day and then asked Yu Erjiao after buying her meteorite to
take me to visit the tower-well again.

Above is the tower-well where Yu Erjiao found her meteorite

The tower is about 2.5m high, with a sharp top and hollow inside, without any decorated pattern outside. On
the south part of the tower body, there is a window for drawing water, and some Buddhist scriptures can be noticed on the inner wall just facing to the window. Some aerial root from the nearby old tree had invaded into the tower body, and it seems after many years restorations the tower and its base were out of plumb already. The gap in which the meteorite hit and was trapped is about 1.5m from the ground, and the meteorite was very fresh. Yu Erjiao put the meteorite back to its original way when finding, and the meteorite fit the gap very suitable. From the gap and the way the meteorite was trapped, I can imagine it flying from the NW direction.
Yu Erjiao is a pious Buddhist when leading me to visit the tower-well she told me an aspiration. As this locality is in the humid tropical area, every year there will be a long term rainy season. The water torrent will come from the mountain area, and the brook will be flooded. As a consequence, the tower will be watered for several months, which is no good for its protection. Yu Erjiao believes the trapped meteorite is an implication by the Sakyamuni Buddha for her to protect the ancient tower, and if she can sell the meteorite at a very good price she will use the money to build up a circle wall outside the tower, to protect it during the future rainy seasons. My heart was filled with admiration when hearing her aspiration, and I really hope her wish will come true in the near future.
On June 6th, one of my acquainted dealers from Guangdong province got information, that at Manyan village there is an old man hammering a meteorite into pieces in front of his home. I was astonished by the news and decided to visit Manyan village the next day. Manyan is located about 5 km in the NW direction of Mankailong village. If the sugarcane field near Mankailong village is the dense area, then the pieces found in Manyan village might be one of the biggest individuals. We arrived at the Manyan village early in
the morning on June 7th, and by consulting the villagers we met the old man who hammered the meteorite. His name is Yan Changnan, also a local peasant. After a shower on June 5th, he found his home yard was filled with water, then went out to the yard and checked the drainage system. He found there a dark-colored stone had blocked the drainage path, and then he kicked out the stone and hammered it into pieces by a hoe. After doing this, Yan Changnan noticed the inner color of the stone is quite different than the outside, in addition, there are some metal flecks embedded on the fresh broken surface. Remembering his neighbors talking about that lots of people were searching meteorite at Mankailong and Manlei areas recently, he suddenly realized that what he had broken might be a meteorite. He picked and collected some bigger pieces of the stone, and all of the smaller size fragments were collected by his neighbors.

Above is the crater crashed by the meteorite at Manyan village

After talking for a while, Yan Changnan showed us a stainless steel bowl containing some fresh meteorite fragments. The fragments are about 500g and we purchased all of them at a reasonable price. Then we spent the rest of the day in Manyan village and purchased some smaller fragments collected by other villagers. The total weight of the broken pieces we purchase exceeded 1kg already. That means if the meteorite was not hammered into pieces by Yan Changnan, it must be weight over 1kg.

Above are parts of the meteorite fragments gathered at Manyan village

The ethic religion of Dai people is Theravada Buddhism. Every village possesses a temple, and each temple has an abbot. The abbot at the temple of Manlun village named Dubiyi, and it was said he also
found a meteorite himself. As a result, everyone coming here to search for the meteorites is interested to have a look at the Buddhism related meteorite. On June 8th, when I went through Manlun village again, I met Dubiyi at his temple. As there are already 2 local people arrived earlier than me, Dubiyi invited the 3 of us to drink tea then showed us the meteorite when drinking. The meteorite is about 14 grams with a little bit of yellow dirt on the surface and seems nothing more special than those found in the sugarcane fields. After viewing his meteorite, the 2 local people wanted to visit the main hall and pray in front of the Buddha. Dubiyi asked me if I have the interest to go together, I replied when in Rome do as the Romans do, and then followed them to the main hall and praying.
Above are the local monk Dubiyi and the meteorite he claimed found by himself

It might be the reward for my devout blessing in front of the Buddha, I was hit by the luck on June 9th, a day before I came back to Beijing. As it is the final whole day that I can spend on the meteorite landing areas, I decided to hang at Manmedai village to seek the chances to purchase meteorites. Manmedai is located at SE side of Mankailong, and the dense area is just between the two villages. Also, Yan Wennan, the man whose pigsty was hit by a meteorite lives in Manmedai village, so I believed there should be more meteorite samples in the villager’s hands. However, when I walked into the village, there was already a dealer from Jiangsu province sitting at the east entrance of the village to purchase meteorites. To avoid the competition with the Jiangsu dealer, I wandered aimlessly along the village streets thinking about transferring to other villages to buy the meteorites. At that time a local woman walked close and told me that she also has a meteorite in her home, and then I followed her to look at the meteorite.

Above are Yu Eryang and the writer together with the meteorite and the crashed pottery roof tile

The name of the woman is Yu Eryang, living near the east entrance of the village. There is another neighbor’s house at the east side of Yu Eryang’s home, and they are sharing the same courtyard wall. The meteorite Yu Eryang showed me is a pack of fragments about 8 grams weight and very fresh. I asked her where did she found the meteorite, and she told me the meteorite was hitting on her kitchen’s roof, and then bounced into her yard. I turned my head and followed her guiding hand, then a broken pottery roof tile appeared into my eyes. I bargained a little bit, and then made the deal with her. When packing the meteorite fragments and the broken roof tile, Yu Eryang told me a piece of information that there were actually 2 meteorites which hit on her roof. Besides the fragments I purchased, there is another one which hit the blue steel roof of her carport, and because of the steel’s elasticity, the meteorite bounced away and then landed in front of her neighbor’s house. The following day Yu Eryang found the roof of the carport was leaking when raining, and later her neighbor found a 27g meteorite with a few blue paint stains on the surface.
I was very excited when hearing the information, and asked Yu Eryang to invite her neighbor together with the meteorite to come over to have a look. The neighbor is named Yu Mai, over 40 years old, and always have a smile before speaking. I thought the smiling person should be easy to negotiate, but the price she asked for was astonishing. The meteorite is just like Yu Eryang described earlier, with complete fusion crust and partially stained with the blue paint. To collect a complete crasher together with the hit object possessing the impact crater on it is always one of my dreams, but in front of me are an outrageously priced meteorite and the steel roof belong to different families. It seems impossible to get them all at the same time. I reluctantly handed over the meteorite back to Yu Mai, and began to think of a plan to realize my dream.
I talked to Yu Eryang first, telling her I have the interest to purchase the steel roof, and need her to hire a local worker to cut off the cratered area. As we already made a deal for the meteorite fragments and the broken pottery tile, Yu Eryang agreed with my offer straightly. After 15 minutes, a workman came, he tried to use big sized scissors to cut the steel roof at first, but the steel is too thick. He then changed an electric blade saw but nearly hurt himself when cutting the final edge. He was pulling the saw too fast, and the grinding blade was broken, and then the entire machine slipped out of his hand and stirred his cloth. Finally, I got the cut-off steel roof in my hands, but all of the people standing around were frightened by the episode of the worker’s dangerous handling process. The impression on the steel roof can be fitted very well with Yu Mai’s meteorite, however, Yu Mai watched all of the roof cutting processes and knowing that I have the inclination to purchase a set of the meteorite and the roof, her price was no way coming lower down. After a hard time of negotiation, I paid an unbelievable amount of money for the crasher meteorite to fulfill my dream. When packing my belongings and preparing to leave, Yu Eryang told me that one of her relatives who lives in Manzhuang village, about 4km SE, also has a meteorite that landed on his steel roof. If I want to have a look, she can call her relative to bring the meteorite here.

30 minutes later, an old man at the age of 60s walked into the yard. His name is Yan Yingjiao, and is the relative that Yu Eryang mentioned about. He opened a small pack, then 8 or 9 meteorites totaling 30 grams were uncovered. The biggest one is a typical button-shaped oriented piece, weighing 10.3g with distinct blue paint stains on the edge, and is just the one that landed on the steel roof. Yan Yingjiao told me all of his meteorites were found in or around his house, and from the size and number of his meteorites, I realized at the same time that his house is probably located at the real starting edge of the strewn field. I asked his house location, and then he showed me the exact place on my mobile phone map. During the night of the meteorite shower, Yan Yingjiao also heard a loud noise like an extreme low-altitude aircraft, and
then found the blue steel roof covering his yard was leaking when raining. When he climbed up and checked the roof, he found a small crater on the roof and the 10.3g meteorite lying about a half meter away. Although I have spent a huge amount of money on the 27g crasher piece, I still cannot resist this 10.3 small oriented crasher. We discussed the price for about 10 minutes and made the deal a great endeavor. Then I told Yan Yingjiao I can pay the additional money for him if he wants to repair his roof and cut off the crater place for me. He agreed with no hesitation, and we appointed to meet on the next morning at his home to complete the roof cutting.

June 10th about 8:30 am I arrived at Yan Yingjiao’s home. He borrowed an electric saw and climbed on the steel roof to do the cutting. With the working noise ringing out, a group of the villagers gathered outside the yard, and most of them were holding the meteorites they found around the areas. Those meteorites are all in the smaller sizes, ranging from 0.1g to 16g. Among those meteorites, a 15.8g individual grabbed my eyes. It is also an oriented piece but chipped a little bit on the edge and with two areas on the front surface covered with unknown white dirt stains. The holder of the meteorite is a handsome young man over 20 years old. I asked his name and where he found the meteorite, also if the meteorite hit anything around. He told me his name is Yan Wenhan, and the meteorite hit the backside eaves of his house, very close to the cowshed of his home. Then I asked him if he can lead me to his home and have a look regarding the impact roof, and he agreed friendly at the same time.
After 15 minutes, Yan Yingjiao finished the cutting work and handed the cratered roof to me. The 10.3g meteorite can insert into the impress and fit very appropriate. I never imagined that I could have the chances to acquire 2 complete crashers with the paired impression roof pieces together, but it came true within 20 hours. I packed the meteorite and the roof piece carefully, I followed Yan Wenhan to his home. It is a typical local courtyard, with the house towards the south and a cowshed connecting the house on the east side. The meteorite just landed on the connecting area which was covered with asbestos tiles, and
since the asbestos tile is more fragile than those steel roofs, the size of the impact area is bigger than the meteorite size, and the edge was chipped in an irregular shape. Yan Wenhan is a frank young man, and we made a good deal after chatting for only 5 minutes. I located the co-ordinates, and the cratered asbestos tile was cut off for me.

Above is video taken when cutting the asbestos roof at Yan Wenhan’s home

Above are pictures of the cratered asbestos roof and the meteorite in its original position

When I packed up the 15.8g meteorite and the paired roof piece there are no more than 3 hours until my flight will take off. I left the strewn field unwillingly and then landed in Beijing airport at 1 am June 11th. 7 hours later, I sat in the office and started my routine daily work, but my mind was still at the meteorite falling place. I opened the Google earth occasionally to rebuild the meteorite flying trajectory, and hoping to visit the strewn field again during my next vacation. On Sept 2th, Professor Hsu Weibiao in PMO sent me a message that the official name of the meteorite had been approved. The meteorite named after a local village’s name—Mangui, classified as an L6 chondrite, and the shock stage is S5.
Above is a local map which shows each of the villages mentioned in this article.

Above is the video regarding the animals in the meteorite shower locality.
Our Meteorite of the Month is kindly provided by Tucson Meteorites who hosts The Meteorite Picture of the Day.
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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.

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