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Too many years ago to remember, I stumbled on some Allende individuals at the Tucson Show. Hardly a solid find given the quantity and distribution of Allende meteorite samples. In fact, I recall hesitating about purchasing the individuals, but my weakness for numbered specimens with matching cards carried me through. In the end I purchased two of the kits.
Each kit contained a weighted individual of Allende complete with intricately painted specimen number, a matching specimen card from the American Meteorite Laboratory, all in a classic black cardboard and glass display box. When I discovered them in my safe over a decade later, I have found a new appreciation for the specimens.

According to The Mineralogical Record’s Biographical Archive:

The American Meteorite Laboratory in Denver, Colorado was founded in Sedona Arizona as the American Meteorite Museum by pioneering meteoriticist Harvey H. Nininger (1887-1986) in 1937, and re-established (as the “Laboratory”) by Glenn I. Huss (1921-1991) and Margaret Nininger Huss (daughter of Harvey Nininger) in 1960. Their son Gary is a third-generation meteoriticist, now at Arizona State University. They published a book on the meteorites in their personal collection in 1976 and 1986, and reprinted a number of the classic meteorite books by Harvey Nininger. The company still operates out of Westminster, Colorado.
Part of the joy of collecting meteorites is preserving history, as well as playing a role in that collection history in the future. By acquiring and preserving specimens with historic or scientific importance, you are doing your part to carry this fascinating subject to generations yet to come. Imagine if H. H. Nininger, or Mozart for that matter tossed their work in the trash can when they grew tired of it? Instead, we now pick up where previous generations left off. And with that progression comes the responsibility to preserve the quality of the past so you can proudly hand it off to the future. Anything less is, well, unfortunate. Do do your part. Collect with vision and purpose!
Until next time....
Moving a Collection
James Tobin

Have not been doing much meteorite related work for the last two months. I did cut several stones for a friend and they were interesting and rare types which always is exciting. I have gotten a couple updates from the lab where I have an amazing stone being classified. I think that work will be completed soon and it submitted to the Nomenclature Committee for approval. I only got out once to hunt meteorites this year. That was chasing the bright bolide I wrote about in a recent past article. Because while those few meteorite related things were happening I was packing up my collection and everything else we own for the move to their new home. While packing I was thinking about how I would protect them during the time they are waiting to arrive in a couple months.

This is a close up image of the meteorite I have in the works at Cascadia Meteorite Lab. It is almost certainly a type 3. The continuing work is to determine if it is an L or an LL or an L/LL. The last choice is a type no classifier wants to make unless they have to. So more analysis is being done since at the present the meteorite is giving data that puts it right on the boundary of both classifications. More chondrules are being measured and more sample points are being analyzed. It is a great meteorite full of close-packed chondrules in clusters with deformed shapes. The visible metal is certainly sufficient to put it in the L type. But, I will share with you that I find something cool and mysterious about LL meteorites and would love to see it get that classification.
I made several thin sections of the meteorite under analysis. Here are just a couple images from the batch taken of the thin sections. I am looking forward to getting my ultra close up rig for photographing thin section back in operation too. I have almost twenty slides prepared waiting to be ground of other meteorites and miss not making them and imaging the thin sections.

It’s been brewing around in the mind of my wife and me for a couple years that it was about time to move out of the traffic-congested high crime big city. One day when things were particularly crazy around LA she said to me “We are moving to Tehachapi!” My response thinking she was joking was “Either there or Kansas!” She repeated what she had said and I knew she was serious. So being fine with the idea I said: “Ok, I will start fixing up the house to sell and we will find an agent to list it.” I worked for about eight weeks doing all the repairs I had neglected during 33 years of living in the house. Spackling and painting and screen repair and replacing all the cracked panes of glass, and much more. I also had a plumber and electrician come in and do some work. About six weeks into that eight weeks of my work I found a realtor who Sara and I liked immediately to list the house. Most of the meteorites, tektites, impactites, and artifacts were already reposing in boxes by the time of the broker walk through and open house. Just a few remained to be packed away.

Much of my meteorite collection was never visible because we are pretty close to the Pacific Ocean. Just about a mile as the crow flys from the Pacific Ocean. So a portion did not need to be boxed up since they were already. But the display cases and the specimens on shelves and my desk did have to be packed. I thought as I did this about keeping them safe for the long time until I would be able to unpack them. My thoughts part of the time were on the tragic fire at the Natural History Museum in Brazil. The lack of a fire suppression system in the 200-year-old building was disastrous. Even if we are the owners of only small pieces and only as some may be of a few pieces. We all have a responsibility to protect these visitors that have gotten lost in their journey around the Sun; who have fallen to our world. This is not a safe place for them. During countless ages wandering in space, they never rusted even the tiniest bit. Some suffered collisions and were crushed and melted to reform as new and different stones. But they remained. Once they fall to Earth they are at risk of disappearing completely through corrosion or weathering. I have kept them safe so far and need to keep them safe during this move and protect them onward.

The saws and other lapidary equipment was going to have to be readied to move. I am shutting down work for an extended time and have let the couple friends I work for know I can not cut for a while. There is a big bonus for me in this move. I get a dedicated meteorite laboratory at the new house being built. I’m having a great time dreaming about the air-conditioned room that I will have to work in. And I am having fun planning in my mind how I will set it up.

This is an early image of my laboratory workspace.

I have decided to get a new display case for my office inside the house. Since we are now going to be far
from the ocean there may be some other meteorites that I can have out on display. I will also be over two hours closer to the desert to go hunting. I won’t have to fight the horrible traffic to get out of town or when heading back home after hunting. I hope to be able to get out more often and to also do some ghost town and old mine area exploring. I would love to use the metal detector a great amount more. I need to talk to Paul and see if he is still going to put an all-sky camera on his house. We probably don’t need two so close together, but it would be super cool to capture the bolide on camera and then go out and hunt for it. The best, of course, would be to then also find one or more pieces of the fall.

As I suppose you can tell I am pretty excited about this move. It has been a great amount of work so far and much more is still to come but at some point soon we will be in our new home and the fun can begin. Until next time Jim
A friend says a person can never have enough Allende thin sections. It’s easy to see why. Here I offer thirteen photos without comment other than that all but the first are from a single slide and that all but the last have a field of view 3.1mm wide. That last has a FOV one half millimeter wide.
In the last edition, I commenced a series on the tektite “classics”, the essential specimens required to anchor a basic Australasian collection. Splashform dumbbells, teardrops, patties, bars, biscuits, spheroids, and endless plastically deformed oddities reign supreme in the impact-proximal regions of mainland Southeast Asia. Muong Nong-type layered tektites found at scattered localities within this domain provide one of the best clues as to the location and nature of the impacts that produced the vast Australasian tektite strewn field (see my Meteorite Times column of 1/2017).

Now, we move down range about 2000 km (1200 mi) to see what was falling from the sky in the Philippines. At the sensational end of the spectrum were cannon-balls of black glass sometimes weighing over a kilo, bigger than anything that fell in the regions nearer the multiple aerial bursts of the 800,000 year firestorm.

Figure 1: Phundamental Philippinates: Left, bald spheroids (556.0 g top, 567.6 g bottom). This type can occasionally exceed 1 kilo. Center: at 295.5, 230.5, and 306.0 g (T to B,) these are commonly termed “soccer-balls”. Bottom right: Deeply ornamented concavo-convex spallation chips (20-40g) (often called “Bikolite-type”, whether or not actually from Bikol.) Upper right: Spallation chip hinged with museum putty onto a soccer-ball bald spot, illustrating the relationship between all three forms.
Grapefruit-sized projectiles were hurled a thousand miles as the whole earth reverberated and shuddered to dissipate the unthinkable kinetic energy of an impacting asteroidal body traveling at about 100,000 mph.

Figure 1 captures my favorite Philippinite story. The biggest Philippinites (say >500 gms) are nearly always bald, like those on the left in the image. Somewhat smaller specimens retain wonderful soccer-ball-like bread-crust shrinkage cracking, often deeply etched with pits and grooves. At some upper limit in size, the soccer-ball uplands exploded away, ultimately leaving a bald spheroid. At the lower right are examples of deeply ornamented crust fragments that exploded away from a core. These flakes are often termed “Bikolites” by merit of the region where they were first described, although they are clearly Rizalite fragments (or is it Philippinite? Keep reading...) as may be found elsewhere than the Bikol Peninsula.

One story leads to another. H. Otley Beyer, the patriarch of Philippine tektite studies, proposed the term “Rizalite” in 1928 in allusion to the Rizal Province of Luzon where all but one of the initially recognized Philippine tektites were found. As finding localities were extended into other provinces, the Philippinite name became more meaningful and largely replaced the overly-restrictive Rizalite terminology. As a further complication, it has now become quite common for cannon-balls, soccer-balls, and big amagorphians* (see figure 2) to be grouped morphologically as “rizalite-type”, while the smaller ornate spallation flakes get the “bikolite-type” label. “Philippinite” is now the preferred umbrella term for Philippine tektites in general.

Since the days of H. Otley Beyer, strange zoomorphic monsters have been celebrated. I won’t offer any scientific insights as I would certainly reveal my ignorance. They’re just cool and sometimes very large. Please send creation stories. I could use some help here. Beyer had two odd monstrisities he named “The Monster” and “the Animal”. These were acquired by the late Darryl Futrell and were subsequently sold to a new Canadian Impact museum.

Figure 2: Beyer simply called these “Irregulars”, but I prefer “Amagorphians”*. Clockwise from upper left: 389.0, 184.5, 167.7, 200.4g
Regardless of size, most Philippinites are spherical, sub-spherical, or lenticular (like those on the left of figure 3), as if derived from a shower of glass balls. In their molten stage within the impact fireball, they were oscillating low viscosity molten orbs.

Apparently the ejecta ray that was pointed towards the Philippines was loaded with materials that were blasted high into the deep cold and relative void of space before much systematic aerodynamic deformation took place. However, there are also rare dumbbells, teardrops, ovals and other splashform morphologies, all typically deeply corroded with meandering grooves. These would have assumed their primary geometries during the turbulence of the impact event and were incorporated, fully formed, into the ejecta ray. During their descent into the Philippines and surrounding regions there was no reversion to a molten state even as a thin surface melt layer. The principal changes are corrosional. I imagine fingers of sun-hot plasma buzzing over the surface of the stone, carving grooves like a welding torch, as the stone plummets deep in the atmosphere.

Philippinite skin ornamentation is a long story for another day. It was the key to the initial recognition of Philippine tektites. Billitonites (see my Meteorite Times column of 3/2016) had previously been recognized as “true tektites”. An acquaintance of Beyer’s introduced him to a small Billitonite specimen (and, I believe), to the whole subject of tektites. In Beyer’s own words “...he had solved our problem.” The black glass with its characteristic pits and gutters was virtually identical. That is the point where Beyer recognized that, although they were technically the same, he could not appropriately call his stones “Billitonites” or “Australites”. The Philippine specimens recovered to that time (except for one that winked knowingly of the future), were all from the Rizal Province of Luzon. In conformity with the naming practice of the time, “Rizalites” were introduced to the world.
There is another crowning mystery in Philippine tektites. Most famously, on the Anda Peninsula, “Anda” tektites are part of the sacred lore. I still don’t claim to know their story, but they look like a block of black cheese that has been nibbled all over by mice!

This rodent-gnawed appearance is occasionally seen in southeast Asian and Chinese tektites as well, but it reaches its unchallenged supreme form in the Anda Penninsula region of the Philippines. Great Andas are highly prized (and priced). They are also another semantic battleground. Real Anda tektites MUST come from the Anda Penninsula. There are and can be no Anda tektites from Thailand or China or anywhere but Anda. Beware of fallacious claims on internet auction sites. However, permission is freely granted for use of “Anda-type...”.

Reduced to the bare minimum, we were able to simplify the impact-proximal Indochinites into only 3 basic forms (spheroid/patty, dumbell, & teardrop). It has been a degree more complex with Philippinites and there is still much we don’t fully understand. Why must you go a thousand miles downrend to find tektites weighing over a kilo? Are the meandering channels related to plasma-jet corrosion? And importantly, just what sort of mice live on the Anda Penninsula?

Next edition the series moves another thousand miles downstream for a look at the Aussie tektites.

*Somewhere above there is an asterisk sending you here for more information about amagorphians. I once worked with a backcountry bulldozer operator who commonly blamed both “big donakers” and “amagorphians” for his slow progress. I never was sure of the difference, but I’ve always thought that amagorphian should be adopted into the geological lexicon simply for its euphonious qualities. We will see if the scientific world is quick to adopt our pioneering terminology. For the purposes of this article at least, an amagorphian is hereby defined as a large (>150 gm to >500 gm) zoomorphic, anthropomorphic, or cryptomorphic irregular Philippinite mentioned in a Tektite Teaser column.
Thin-section Analysis of the Legendary Longstreet Meteorite at Albion College
Nicolle Zellner / Marci Howdyshell

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Summary
The Longstreet Meteorite, a showcase of Albion College’s rock collection for almost 70 years, has been investigated. Analyses of its exterior and of thin sections of its interior show it to be sedimentary rock and not, as it was originally thought to be, a meteorite. Announcements of this finding were not received well by College alumni or officials.

Background
The Longstreet Meteorite was donated to Albion College by William R. Longstreet in the early 1940s (Figure 1). It was reported that this “heavy, heavy piece of metal…zoomed out of the sky” and fell onto the property of one of Mr. Longstreet’s servants, where it remained for “over a day…the heat from this heavenly body had been so intense that no one dared approach it” (Hollinshead 1955). In a letter from Longstreet to the Alumni Director of the College, written on June 29, 1944, Longstreet refers to the rock as the “Slinery Meteor,” which may refer to the name of the servant who found the rock. Immediately after being donated to the College, it was “eagerly” examined by Professor Clement E. Rood’s astronomy classes. Although Rood had an established reputation as a scientist (e.g., he was a founding member of the Astronomical and Astrophysical Society of America, now the American Astronomical Society, and a fellow of the American Society [sic] for the Advancement of Science [Buck, 1961]), no scientific analyses of the Longstreet Meteorite took place until the present study.

Investigation
Initial observations of the rock indicated its rough and weathered exterior (Figure 2), which is typical of meteorites, but no fusion crust was clearly identified. The fusion crust would have formed as the surface of the meteorite heated and melted during its rapid fall through Earth’s atmosphere (e.g., Hartmann, 1999). With a mass of 14 kg, the Longstreet Meteorite was heavy and had been proposed to be an iron meteorite.
Figure 1. William R. Longstreet graduated from Albion Preparatory School in 1892 and his grandson later attended Albion College. Here, he holds the 14-kg Longstreet Meteorite. Image from Hollinshead (1955).
Thin sections (approximately 47.50 mm × 25.77 mm × 9.94 mm) were prepared and polished in the Albion College Rock Shop and a Leica petrologic microscope with two polarizers was used to analyze them. Thin section analyses clearly indicated that this rock was not a meteorite. No characteristic Widmanstätten pattern, which forms in most iron meteorites, was found. Furthermore, clasts of sedimentary rock and terrestrial minerals, including sand, clay, quartz, and feldspar, were seen (Figures 3a, 3b, and 3c). Additionally, a quartz vein edged with biotite (Figure 3d) and chlorite could also be seen within the thin section.
Figure 3. Thin sections of the Longstreet Meteorite showing (a) brown clay in the matrix, (b) granite clasts in polarized light, (c) twinning ("rippled") feldspar (circled in red), and (d) a quartz vein with biotite (red arrow) along the edges.

Lastly, even if the story behind the arrival of the Longstreet Meteorite is taken to be true, the description of the meteorite provided (Hollinshead 1955) does not agree with what is known to be true about meteorites. A meteorite typically has a fusion crust, an aerodynamic shape, and, even shortly after falling to the ground, is cool to the touch. The Longstreet Meteorite had none of these characteristics.

Conclusion
The announcement that this venerated meteorite is, in fact, terrestrial was not well received, especially by Albion College’s long-time staff members and professors emeriti. The artifact was removed from its showcase in the Observatory; it was taken off of the campus tour; and the Admission Office revised the script for tour guides. The legend has been put to rest, and the rock once known as the Longstreet Meteorite has been moved from the Observatory to a more fitting home on a shelf in the Department of Geological Sciences.

It should be noted that it is not uncommon for rocks to be mistakenly identified as meteorites ("meteor-wrongs"; Korotev 2010), and distinguishing between "true" meteorites and terrestrial rocks can prove difficult. Only by careful inspection, analysis of historical documents, and close examination of the physical makeup of the rock was the true identity of the Longstreet Meteorite determined. From a scientific perspective, the Longstreet Meteorite could serve as a brilliant teaching tool for future generations of astronomy students and geology students alike at Albion College.

Acknowledgements
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References


Hollinshead A (1955) in Eminent and Interesting Albionians (Volume 1), Albion College Alumni Association.

Our Meteorite of the Month is kindly provided by Tucson Meteorites who hosts The Meteorite Picture of the Day.

Estherville contributed by Twink Monrad, IMCA 9454
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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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