**Headline:** Exploring Ancient Understandings of Meteorites in Archaic Societies

By Andrew Califf

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**[Article Body:]**

Five times a day, approximately one-fourth of the world’s population turns toward Mecca to bow their heads in prayer. The Kaaba at the center of this global genuflection has a cornerstone that some [speculate](https://adsabs.harvard.edu/full/1974Metic...9..173D) is a meteor.

Meteoritic artifacts appear as early as the dawn of Egypt’s Early Dynastic Period, approximately 4,500 years ago. Archaeological teams in the 1920s reported that [beads](https://www.sciencedirect.com/science/article/pii/S0305440313002057) from the Gerzeh cemetery in northern Egypt had very high concentrations of nickel, typical of meteoritic iron. These are the earliest analyzed artifacts, and modern [metal testing](https://www.sciencedirect.com/science/article/abs/pii/S0305440317301322) technologies mean that chemists can now identify and catalog the presence of meteoritic iron in archaeological collections across Eurasia. Since 2013, this has led to many discoveries reframing the prominence of extraterrestrial resources in the archaeological record, including identifying that King Tutankhamun’s dagger was crafted [from a meteor](https://www.history.com/news/researchers-say-king-tuts-dagger-was-made-from-a-meteorite).

Experts [believe](https://www.astronomy.com/science/a-new-origin-story-for-king-tuts-meteorite-dagger/) this opulent weapon was a gift to the boy king’s grandfather Amenhotep III around 1300 BCE, from the king of the Mitanni region, based on the [Amarna tablets](https://www.metmuseum.org/toah/hd/amlet/hd_amlet.htm). This high-status gift is one of the many ways meteoritic iron was revered by ancient civilizations. One of the earliest [Egyptian hieroglyphics](https://www.geolsoc.org.uk/Geoscientist/Archive/April-2014/Iron-from-the-sky) for iron seems to be derived from a longer phrase translating to: “[iron from the sky](https://journals.sagepub.com/doi/10.1177/0307513319899948).”

This word has cosmological connotations associated with the Egyptian belief that the sky was an [iron pot or tub](https://www.newscientist.com/article/2242507-ancient-egyptians-saw-the-sky-as-crumbling-iron-tub-filled-with-water/) filled with water, and bits of it fell to the Earth in the form of meteorites.

“We have evidence for the idea that the sky was a dome made of iron in a few different civilizations,” explains Victoria Almansa-Villatoro, the Egyptologist who [analyzed](https://www.sapiens.org/archaeology/ancient-egyptians-meteorites-astronomy/) the hieroglyphic for iron (and sky), during an interview. “If all of these civilizations had this idea and they are so spread apart, it is possible that the idea goes way back in time, maybe before writing was invented.”

Almansa-Villatoro emphasizes tracing any common meanings or beliefs linking such cultures is purely speculation. Contemporaneously to the Mitanni, it is believed the Hittites used meteoritic iron by 3,000 to 2,000 BCE as one [iron dagger](https://www.heritagedaily.com/2024/04/the-alaca-hoyuk-meteoric-dagger/151557) excavated in Alaca Höyük in modern-day Turkey was made from a meteor and dated to 2,500 BCE. [Iron pendants](https://www.researchgate.net/figure/Meteorite-alters-Pendant-of-Umm-El-Marra_fig5_276049266) from Umm el-Marra in Syria and an iron axe from Ugarit in Lebanon are other key examples of hammered meteoritic iron.

The process of working with meteoritic iron is much simpler than having to reduce the impurities out of terrestrial iron ore (because meteoritic iron is already a metal). All that needs to be done is hammering the material. This key difference is why meteoritic iron [appears well before](https://www.nationalgeographic.com/premium/article/how-ancient-cultures-discovered-iron-feature) terrestrial iron and even before the beginning of the Bronze Age, which varies by region but is approximately from 3,000 to 1,200 BCE.

The Gerzeh beads and King Tutankhamun’s dagger were hammered cold or hot, similar to early gold and copper processing. Smelting out impurities from terrestrial iron demarcates the start of the Iron Age because Bronze Age furnaces were not hot enough for such a complex process. The dawn of this development is between 1,200 and 600 BCE depending on the region. How early metallurgists started working with iron ore is still being actively explored by experts. Even though the melting of copper is much simpler than iron production, it may have played a role in the development of iron reduction.

“Copper slags have a lot of iron oxide, and if your furnace reduces too much you will get a small amount of iron in your slag,” explains geochemist and metallurgist Albert Jambon, Sorbonne University, during an interview. “Maybe the first people were working with slags, but to go from slag to an ore, I just don’t know.”

Slag is the waste from metal processing, and it is a good and readily available source of data in the archaeological record. Jambon devised a chemical strategy for identifying meteoritic iron by studying the ratios of nickel to iron and copper in artifacts. It seems that all the iron artifacts from the Bronze Age came from outer space, but research published in 2025 identified that [three of 26 iron artifacts](https://www.sciencedirect.com/science/article/pii/S2352409X25000148?dgcid=author) were meteoritic. These artifacts were found in an early Iron Age cemetery of the Lusatian culture in modern-day Poland. Oddly, these artifacts were not found with any wealthy implements in what seemed like graves of “commoners,” a stark contrast to how meteoritic iron was valued during earlier historic periods.

Even though approximately [17,000 meteors weighing more than 50 grams](https://pubs.geoscienceworld.org/gsa/geology/article/48/7/683/584575/The-spatial-flux-of-Earth-s-meteorite-falls-found) hit Earth each year, most are made of stone. Only about 4 percent are composed of iron alloys with abnormal nickel content that people can use. These materials became a rare commodity for ancient people, who began valuing this easy-made iron above gold. [Cuneiform tablets](https://www.researchgate.net/publication/284702709_Metals_according_to_documents_from_ktiltepe-kanish_dating_to_the_old_assyrian_colony_period) found at the Old Assyrian Colonial site of Kültepe-Kanesh in Turkey from approximately 4,000 years ago refer to a “sky metal” that cost as much as 40 times the price of silver. Silver was the most valuable common precious metal in the region at the time.

Assur, the capital of the Old Assyrian city-state, felt that the meteoritic iron needed to be taxed, which makes Jan Gerrit Dercksen of Leiden University think that it was common enough to be included in the system of trade tariffs. In Anatolia, not every merchant could afford to trade meteoritic iron, and it seems that groups of merchants combined their funds to buy this sky metal in bulk according to Dercksen.

There was a smaller source of meteoritic iron coming from the East into Assur, but it is difficult to identify where the trade originated. Jambon has struggled to identify more meteoritic iron artifacts farther East, but it has been difficult to obtain and test artifacts from Turkey. As for Iran, there are very [few iron artifacts](https://www.iranicaonline.org/articles/iron-age) and they don’t appear well into the Iron Age.

This as well as the context in which most Bronze Age meteoritic iron was found suggests that its rarity in part made it a highly valued commodity. This changed with the Iron Age, while meteoritic iron remained rare, terrestrial iron became more common and the early Iron Age cemetery site in Poland is the only identified site where meteoritic iron was found alongside terrestrial iron. It is unclear how much meteoritic iron was used as the number of iron artifacts exploded in the archaeological record.

“There are two possibilities: either there was so little meteoritic iron [artifacts] that it looks like there was no meteoritic iron or the second possibility [is], the price of iron sank so much cheaper than copper,” explains Jambon. “People didn’t care anymore about meteoritic iron because iron was so common it was no longer fashionable.”

**The Sky is Falling**

There is evidence globally that meteors have carried importance across millennia, including the Western Hemisphere. Archaeologists in Arizona found the [Winona meteorite](https://meteoritegallery.com/winona-winonaite/) inset in what was assumed to be a ritual cyst in a pre-Columbian settlement*.* The Clackamas tribe in Oregon have a rich oral tradition and a range of ceremonies surrounding the [Willamette meteor](https://www.amnh.org/exhibitions/permanent/the-universe/planets/planetary-impacts/willamette-meteorite/agreement), the largest meteor found in North America. Just like the ancient Egyptians, the Hopewell tribe made [beads](https://www.sciencedirect.com/science/article/abs/pii/S0305440317300353?via=ihub) out of meteoritic iron brought from more than [400 miles away](https://www.sciencedirect.com/science/article/abs/pii/S0305440317300353) as well as adzes and earspools.

In the 1500s, Indigenous guides brought Spanish soldiers to a field of at least 26 impact craters 500 miles north of Buenos Aires that they called Piguem Nonraltá. The Spanish translated this to [Campo del Cielo—“field of the sky.”](https://adsabs.harvard.edu/full/1996M%26PS...31..433C) The Spanish soldiers claimed they saw a huge slab of iron but couldn’t believe the local stories that it had fallen from the sky.

The meteor shower occurred approximately 4,500 years ago and was recorded by the local cultures as a great [catastrophe](https://fcaglp.fcaglp.unlp.edu.ar/~sixto/arqueo/meteoritos.htm). Spanish records indicate that the Indigenous tribes made weapons from the iron, but none have been preserved or identified. This field is home to some of the world’s largest meteorite fragments including the 30-ton Gancedo fragment found in 2016.

A meteorite currently in the Academy of Sciences of Munich struck Zanzibar in the middle of the 19th century only to be revered by the Wanika tribe until a Maasai cattle raid made them lose respect for it. They promptly sold it to German missionaries.

Prehistoric stone tools also developed a type of lore as good luck charms in different periods and regions due to different cultic traditions largely associated with cosmological concepts.

Tuvan reindeer herders in northern Mongolia continue to collect prehistoric stone tools for good luck and call them “sky stones.” Obsidian and flint tools of the Neolithic and Paleolithic in both classical Greek and Roman periods were called “[lightning stones](https://www.getty.edu/publications/ambers/intro/15/)” because they looked like weapons and were associated with the lightning bolt weapons of Zeus. It was recorded as late as the 20th century in Italy that Neolithic flints were treated as amulets to protect against lightning and natural disasters.

It is speculated that people didn’t associate these tools or lightning stones as man-made from an earlier period. Scholar Christopher A. Faraone [writes](https://journals.openedition.org/kernos/2283) that there is “no evidence that the Greeks or Romans realized that these axe-heads were manufactured by previous stone-age cultures and indeed the inclusion of them in [natural history and geology books] confirms… that they were believed to be ‘natural’ stones which, like amber, jet or coral, had special protective powers.”

The historical depth and meaningful associations people have historically placed on meteoritic iron are more fully illustrated by the tale of a [1,000-year-old Buddha statue](https://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.2012.01409.x), made by the Bon culture in Tibet. A Nazi expedition looted the statue weighing just more than 10 kilograms between 1938 and 1939 not knowing that it was made out of [meteoritic iron](https://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.2012.01409.x).

Indiana Jones wasn’t there to rescue the statue, and it disappeared for decades. The statue reappeared in the hands of a private collector, who collaborated with researchers and determined its extraterrestrial composition and landing spot on Earth. They determined it came from the Chinga meteor which landed 10,000 to 20,000 years ago in southern Siberia, likely traveling thousands of kilometers in its journey to Tibet. While the space-born Buddha is one of the most unique and intricate objects crafted from a meteor, the oldest meteoritic artifacts found east of the Levant are [weapons](https://library.si.edu/digital-library/book/twoearlychinese411971gett) from China’s Shang Dynasty, dating to 1,400 BCE. [A knife and a pole-mounted dagger-axe](https://www.sciencedirect.com/science/article/abs/pii/S1296207417305356) called *ge* from 900-800 BCE were also made from meteoritic iron.

**Baetyls**

Meteors are part of many myths and stories around the globe, but one of the most interesting correlations between meteors and sacred sites is found in southwest Eurasia and the Mediterranean region. Baetyls are an ancient tradition of using sacred stones thought to be meteorites or based on meteorites. The etymological origin of the word translates to “house of god.”

Thought to originally refer to open-air sites of worship from the original Semitic term, depictions across cultures and civilizations, however, all show hewn stones at the center of god’s house that some speculate are meteorites. The word baetyl itself is now used to refer to these revered stones.

In Agia Eirini, Cyprus, more than [2,000 terracotta figurines](https://www.labrujulaverde.com/en/2024/07/the-terracotta-army-of-agia-eirini-the-largest-find-of-late-iron-age-sculptures/) were found surrounding and facing a cultic stone on an altar. This miniature terracotta army was surrounding a round-shaped small boulder that appears contextually to have been treated as a sacred baetyl.

Baetyls [were known to be](https://www.livius.org/articles/religion/baetyl/) in the Phoenician cities of Byblos and Tyre and were adopted by Greek tradition in Delphi at the Temple of Apollo and the Needle of Aphrodite in Paphos. The origin of the baetyl at Tyre may be related to accounts from the Phoenician writer, Sanchuniathon, that the goddess Astarte found a stone fallen from the sky, which she took to Tyre to worship in a shrine.

It is even speculated that the cultic practices around meteors played a role in the founding of Rome. Rome had a sacred black stone and shrine like a baetyl called the [*Lapis Niger*](https://www.researchgate.net/publication/372250475_Rethinking_the_Lapis_Niger), which was believed to have been derived from preexisting cultic worship practices. According to the Roman Grammarian and teacher Marcus Verrius Flaccus, the *Lapis Niger* marks a [spot of ill omen](https://topostext.org/place/419125SNLa) and was intended to be the mythical founder Romulus’s burial spot but was, in fact, not used as such.

Excavations under Giacomo Boni at the Roman Forum in 1899 uncovered what was dubbed the Lapis Niger and the tomb of Romulus. This was something of a misnomer because it is unclear whether he actually found this site or if the accounts were accurate in the first place.

The [archaeological journal volume](https://www.journals.uchicago.edu/doi/pdf/10.2307/496877) about his excavations from 1903 suggested that the polished black stone on the *Lapis Niger* that Flaccus saw could have been a meteorite, but the excavations from 1899 only seemed to have uncovered copies influenced by the *Lapis Niger*. Etruscan [grave markers](https://x.com/OptimoPrincipi/status/1616795075874275329) from a major necropolis in Cerveteri have similar black stones to that of the *Lapis Niger*.

There are several [textual references](https://pubs.geoscienceworld.org/gsl/books/edited-volume/1643/chapter-abstract/107453266/Meteorite-records-in-the-ancient-Greek-and-Latin?redirectedFrom=PDF) to sacred stones from the sky in Greco-Roman sources that experts believe are meteor fragments. The religious historian Mircea Eliade even [asserted](https://press.uchicago.edu/ucp/books/book/chicago/F/bo3643675.html) that important holy sites, including the Palladion of Troy, the Artemis of Ephesus, and the Cone of Elagabalus in Emesa, were actually based on meteorites.

There is no physical evidence supporting the origin stories of these shrines and the historical speculations surrounding them—no excavated or identified baetyl was a meteor. Other descriptions of baetyls are regularly just rock or even simply mounds of earth. The same stands true for the Egyptian Benben stone—a black pyramidal stone thought to either be on top of a pyramid or influence the pyramids in ancient Egypt.

Benben has become a generic term for the top cornerstone of a pyramid or obelisk, but it is derived from a revered one mentioned repeatedly in Egyptian texts. The [original](https://robertbauval.co.uk/articles/articles/DE14.html) was venerated at the “Mansion of the Phoenix” within the Great Sun Temple of Heliopolis but likely predates the sun cult of Ra. It is [linked](https://www.glencairnmuseum.org/newsletter/2021/7/13/ancient-egyptian-creation-myths-from-watery-chaos-to-cosmic-egg#:~:text=Atum%20is%20self%2Dcreated%20and,of%20moisture%20(Figure%2010).) to the creation story of Atum, one of the oldest Egyptian deities. The Benben is either the hill he rises out of the waters from or what he falls out of the sky on (remember the Egyptian sky being an iron tub of water). But Atum is credited with and linked to many cosmological symbols.

Just like the Black Stone of the Kaaba in Mecca, it is still not scientifically conclusive whether or not any revered stones recorded in historical documents are meteors. It is speculated there are cultic, pre-Abrahamic items of worship inside the Kaaba Similarly, any potential meteor worship in the Greco-Roman pantheons could have been derived from earlier traditions, like how Atum’s Benben predated the Sun God Ra.

Although the Black Stone, or *al-Hajar al-Aswad* in Arabic, makes appearances during the lifetime of Abraham and Muhammad, it supposedly fell to Earth when Adam and Eve were expelled from Eden. It landed where they were to build the first temple, and it was placed into the Kaaba by the Prophet Muhammad in 605 CE. According to [tradition](https://islamtalk.medium.com/the-history-and-significance-of-the-kaabas-black-stone-55b76d2d818e), the Black Stone was originally white but turned black as it absorbed the sin of the hajis who touched it at Mecca. Islamic tradition is the only source of information on the origin of *al-Hajar al-Aswad*.

In the oldest known epic poem from Mesopotamia, the titular protagonist Gilgamesh [dreams](https://bardmythologies.com/gilgamesh/) of a meteor landing outside the ancient city of Uruk that he is unable to move. This dream has prophetic meaning for the rest of the epic, putting meteors front and center in one of the oldest pieces of literature.

Philosophers of the Greco-Roman period were some of the first known to record rocks falling from the sky. Aristotle, Plutarch, and Pliny the Elder, to name a few, were the first to record a meteor fall in Turkey around either 467 or 466 BC. Meanwhile, the community of European scientists debated the existence of meteors until the early 19th century; a [meteor shower](https://www.lpi.usra.edu/meteor/metbull.php?code=12434) in France in 1803 ended the debate.

The uncertainty of textual references can hopefully be proved by the archaeological record. Jambon first started using his chemical analysis looking for meteoritic iron in 2010 after purchasing an XRF instrument. Despite the many obstacles in obtaining old artifacts from around Eurasia, he continues to shine a light on ancient metallurgical technologies.