Iron in Egyptian relics came from space

Meteorite impacts thousands of years ago may have helped to inspire ancient religion.

Jo Marchant

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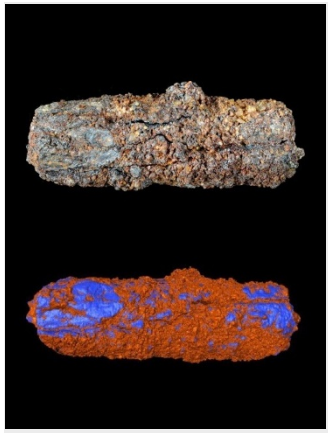

Open Univ./Univ. Manchester

The Gerzeh bead (top) has nickel-rich areas, coloured blue on a virtual model (bottom), that indicate a meteoritic origin.

The 5,000-year-old iron bead might not look like much, but it hides a spectacular past: researchers have found that an ancient Egyptian trinket is made from a meteorite.

The result, published on 20 May in *Meteoritics & Planetary Science*[1], explains how ancient Egyptians obtained iron millennia before the earliest evidence of iron smelting in the region, solving an enduring mystery. It also hints that they regarded meteorites highly as they began to develop their religion.

“The sky was very important to the ancient Egyptians,” says Joyce Tyldesley, an Egyptologist at the University of Manchester, UK, and a co-author of the paper. “Something that falls from the sky is going to be considered as a gift from the gods.”

The tube-shaped bead is one of nine found in 1911 in a cemetery at Gerzeh, around 70 kilometres south of Cairo. The cache dates from about 3,300 bc, making the beads the oldest known iron artefacts from Egypt.

A study in 1928 found that the iron in the beads had a high nickel content — a signature of iron meteorites — and led to the suggestion that it was of celestial origin[2]. But scholars argued in the 1980s that accidental early smelting could have led to nickel-enriched iron[3], and a more recent analysis of oxidized material on the surface of the beads showed low nickel content[4].

To settle the argument, Diane Johnson, a meteorite scientist at the Open University in Milton Keynes, UK, and her colleagues used scanning electron microscopy and computed tomography to analyse one of the beads, which they borrowed from the Manchester Museum.

The researchers were not able to cut the precious artefact open, but they found areas where the weathered surface had fallen away, providing what Johnson describes as "little windows" to the preserved metal beneath.

Microscopy showed that the nickel content of this original metal was high — as much as 30% — suggesting that it did indeed come from a meteorite. Backing up this result, the team observed that the metal had a distinctive crystalline structure called a Widmanstätten pattern. This structure is found only in iron meteorites that cooled extremely slowly inside their parent asteroids as the Solar System was forming.

Using tomography, the researchers built up a three-dimensional model of the bead's internal structure, revealing that the ancient Egyptians had made it by hammering a fragment of iron from the meteorite into a thin plate, then bending it into a tube.

Gifts from the gods

The first evidence for iron smelting in ancient Egypt appears in the archaeological record in the sixth century bc. Only a handful of iron artefacts have been discovered in the region from before then: all come from high-status graves such as that of the pharaoh Tutankhamun. "Iron was very strongly associated with royalty and power," says Johnson.

Objects made of such divine material were believed to guarantee their deceased owner priority passage into the afterlife.

Campbell Price, a curator of Egypt and Sudan at the Manchester Museum who was not a member of the study team, emphasizes that nothing is known for certain about the Egyptians’ religious beliefs before the advent of writing. But he points out that later on, during the time of the pharaohs, the gods were believed to have bones made of iron.

He speculates that meteorites may have inspired this belief, the celestial rocks being interpreted as the physical remains of gods falling to Earth.

Johnson says that she would love to check whether other early Egyptian iron artefacts are of meteoritic origin — if she can get permission to study them.

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References

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