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Comment

El Ali meteorite: From whetstone to fame and to the tragedy of local people's heritage

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Abstract–The El Ali meteorite, a colossal 15.2 t iron meteorite, was discovered in an area characterized by bushy calcareous evaporates (sedimentary distinctive textures, which align with the description of the meteorite's find location) near the town of El Ali in West Hiran, Somalia. This paper delves into the fascinating history of this meteorite, tracing its path from obscurity to international prominence and then to the tragedy of losing a local people's symbol and heritage. For centuries, nomadic local people have used the rusty brown rock as a humble whetstone or honing stone. However, over time it has transformed into a symbol of local heritage and resilience named the "Shiid-birood." In 2022, a pivotal moment occurred when the meteorite was classified and three previously unknown minerals—*elaliite*, *elkinstantonite, and olsenite*—were identified in the meteorite. These findings sparked international media attention to the El Ali meteorite, leading to its official recognition by the Meteoritical Society. Almaas University researchers were the first to interact with the meteorite in Mogadishu, Somalia, and provided initial descriptions, properties, and measurements of the meteorite. Remarkably, the El Ali meteorite ranks as the ninth largest meteorite globally, weighing an impressive 15.2 t. However, secrecy and uncertainty surround its fate. The meteorite has been exported to China, leaving Somalia bereft of its cultural and natural heritage significance. Will it be cut into pieces or preserved intact for exhibitions and future scientific studies? Perhaps, there is still some hope to ensure its return to its rightful place of origin—Somalia.

INTRODUCTION

The El Ali meteorite is a 15.2 t iron meteorite from El Ali town, Somalia. The meteorite was identified as a member of the IAB Complex group of meteorites. This group is known for its broad compositional diversity and the presence of silicate and other mineral inclusions. These features, among others, have led researchers to propose that the IAB iron meteorite, including the El Ali meteorite, formed through partial melting caused by impact heating on a porous, chondritic-rich parent body (Herd et al., 2023, 2024; MacPherson, 2022). Recently, in Somalia, the El Ali meteorite has attracted widespread attention; scientists emphasize its scientific and cultural significance, while the media often highlight it as a precious and remarkable gemstone, all due to recent research that revealed new minerals within the stone (Herd et al., 2023). This paper discusses how the El Ali meteorite reached its current stage of publicity and what was known about its earlier history, in addition to the mystery of its disappearance and final destination.

The El Ali meteorite was physically known to the inhabitants of the region in the past and was considered a significant landmark, but it was just stone

FIGURE 1. The town of El Ali (meaning Ali's borehole) is named after the borehole itself, located 1.5 km to the west of El Ali town.

FIGURE 2. Afeelaha stone photographed while sharpening a knife.

and nothing when it came to the value of the area's cultural history.

Long recognized as "Shiid-birood," a reference to the iron stone, it has long served as a symbol for the community. The surrounding area was eventually given the same name (Hussein, 2023).

Some local legends mention that "the Italians tried to take it during the colonial period, but they failed due to the meteorite's immense weight and the resistance from local residents" (Egeh, 2023; Mahamud, 2023) suggested that this stone was well known in the past.

Two parallel roads enter El Ali town from the west. Both are utilized to bring camels to water at the El Ali well in the town and to carry residents (Figure 1). Two sizable twin stones are used to distinguish the two roads. "Afeelaha" is the name of one, and "Shiid-birood" is the name of the other road (Hussein, 2023).

Situated on the southern road, almost 10 km away from the Shiid-birood, lies the Afeelaha stone (Figure 2). Sharpening is referred to as "afeelaha," and it is done on all cutting instruments, including knives and axes (Hussein, 2023). About 25 km west of El Ali town, on the northern road in the Shiid-birood area, lies the Shiid-birood stone, also known as the El Ali meteorite. The meteorite habitat is characterized by the absence of plant growth for about 10 m around it (Figure 3) and the surrounding black rocks (Figure 4) that resemble burnt stones (Hussein, 2023).

Livestock tend to avoid the stone, which some say takes on an animal-like appearance—resembling a horse —at sunset. People say it resembles a horse. Local children are known to play on it, pretending to ride it like a horse (Hussein, 2023).

DISCOVERY

The Shiid-birood stone (El Ali meteorite) underwent a major transformation in 2022 when a sample was removed so that the meteorite could be classified. During the process of classification and subsequent analysis, it was found to contain three new minerals (elaliite, elkinstantonite, and olsenite) that had never been observed on Earth before (Herd et al., 2023). Following Meteoritical Society naming guidelines, the stone was named the El Ali meteorite, which is now the foremost culturally significant and ninth largest meteorite in the world with significant interest (Gattacceca et al., 2022; MacPherson, 2022). Furthermore, if more samples from the massive El Ali meteorite impact site are collected, there is a chance for learning much more about its cultural prehistory (Gessler, 2023; Gessler et al., 2023).

GEOLOGICALLY

The town of El Ali is located west of Hiran, in the central region of Somalia. This region is dominated by sedimentary rocks, with the most prominent unit being the Main Gypsum Formation, which dates back to the Early Cretaceous period. Gypsum crystals are intercalated

FIGURE 3. The area around the meteorite is devoid of vegetation and tall trees.

FIGURE 4. The black rocks are restricted to the area surrounding the meteorite and appear to be hammerstones, while the light colored rocks are the sedimentary rocks in the area.

between the limestone, calcarenite, sandstone, and shale. The thin variegated gypsum is intercalated with thin dolomite strata. The Main Gypsum Formation lies between the Garbaharre Formation in the west and the Mustahil Formation in the east (Moallim, 1993).

Two different types of basalt are known to exist in the area. One type of basalt is augitic basalt, which is interbedded with sediment in a subaquatic environment and has a typical fluidal structure and desquamation-type surface. Because of the associated sediments, it is thought that this type dates to the late Cretaceous. The other type is referred to as olivine basalt; it emerges on a small scale after intruding into the sequence up to the surface. Due to its stratigraphic location, the second type of age is late tertiary (Moallim, 1993).

Although studies have not yet indicated the exact date and timing at which the El Ali meteorite reached the Earth, on the basis of the age of the Main Gypsum Formation and nearby associated formations, as well as the meteorite's location at the surface, it has been partly buried, indicating that it has fallen for no more than a few thousand years. A radiocarbon analysis of the El Ali meteorite sample "Nightfall" (R4080) indicates a 14C activity of 3.5 $\pm$ 0.1 dpm/kg (disintegrations per minute per kilogram, which suggests a recent age of less than a few thousand years) (Jull, 2024).

FINDING

The advent of smartphones allowed local residents near Shiid-birood to connect with major cities such as the capital, Mogadishu, where they were able to consult with geoscientists who recognized the stone's potential scientific value and recommended further research (Hussein, 2023). This prompted them to send samples to a Chinese company operating in a neighboring country, which confirmed the stone's commercial value without revealing its name (Egeh et al., 2023; Jezow, 2020).

Almaas University was the first to demonstrate that the Shiid-birood stone was a meteorite upon its arrival in Mogadishu and proposed sending a sample for analysis, which led to the discovery of new minerals. It was one of the sources, and the main one, that played a significant role in the recommendations and identification of the Shiid-birood (Hussein, 2020).

Based on information about the stone, the locals were eager to extract the stone from the site for marketing purposes, but could not reach a consensus (Egeh, 2023).

Following intense disputes within the local community concerning the meteorite's disposition, tensions escalated culminating tragically in multiple fatalities. Amidst this unrest, the meteorite was ultimately removed and transported to Buqda-aqable, the principal administrative center of the local governing body (Egeh et al., 2023; Jezow, 2020). In 2020, it was subsequently sold to a consortium of businessmen and relocated toward Mogadishu by vehicle. Upon reaching the outskirts of the capital, Mogadishu, security forces intercepted the vehicle. After several days without any claims, authorities contacted the registered owner of the vehicle, who clarified that the truck had already been sold. Despite this temporary interdiction, the meteorite was shipped out of the country. For the local community, this episode represented not only

the loss of a culturally significant artifact but also the deepening of internal divisions and mistrust (Jezow, 2023).

Although the Shiid-birood stone was out of public view, the name never disappeared and persisted in the region. There is a possibility to collect further information from the stratigraphic context of the big meteorite, despite the site's restricted access due to security concerns (Hussein, 2023).

SUMMARY

In China, El Ali is currently being offered for sale as much as $5,000,000. It is worth has been increased by recent studies that have emphasized its significance as part of our cultural and natural heritage; therefore, its increase in value is not surprising (Gessler et al., 2023; Hussein, 2020).

Furthermore, the El Ali meteorite's future appears unknown, but the most important concern is whether this national treasure will eventually be forgotten or return to its home nation.

The El-Ali meteorite has gone to China and part of Somalia's important heritage has been erased. It is not known whether it will be cut into parts, which is worse, or preserved as a whole for exhibitions and re-examination in a place, which is an opportunity to preserve its heritage value and increase its chance of returning it to its country of origin. Maybe we can still do something to influence the sellers and buyers to keep it intact.

RECOMMENDATION

Although El Ali has gone, there is still a window of opportunity for research and hope after an effort to eventually return it to the country of origin, which was recommended as follows:

- Even though the El Ali meteorite has gone, there is hope that it can be brought back, which begins with awareness of its importance to those who have power, such as the relevant authorities in the government.
- Collaborating and taking part in the effort to return it back by organizations such as UNESCO which support heritage, culture, science, and research.
- Efforts should be made to prevent it from being cut into pieces and preserve it as a whole for research purposes and its scientific and cultural value.
- This paper marks the start of tracing and opens the door for search and rescue operations for the El Ali Meteorite, enabling it to be returned to our nation.
- Further research on the main mass, location, impact site, and fragments of the El-Ali meteorite is needed.

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Data Availability Statement—The anonymised data collected are available as open data via the Duke University online data at the link: https://people.duke.edu/~ng46/El-Ali/.

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