A Micrometeor Impact – Lake Wilson, Kansas?

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ABSTRACT

Much ado about 'nothing' was raised when a suspect 'object' hit near Lake Wilson, Kansas on August 10, 2006. After a field investigation, a magnetometer survey, thin section analysis, shotgun field tests, and neutron activation analyses (NAA), no 100% conclusive physical evidence exists as to what caused the impact. However, enough NAA chemical evidence was found to suggest a micro-meteor was what created an 18" wide and 12" deep 'crater' at the site.

INTRODUCTION

Throughout geologic history Earth has been bombarded by meteors, comets, and asteroids leaving craters (astroblemes), as well as impacts on Earth's moon and the planets and their moons within our solar system. These impacts have often led to catastrophic conditions including the demise of the dinosaurs but they have also created spectacular night sky shows like the Perseids, Geminids, and Leonids. Geologist know that such impacts leave other evidences such as tektites, coesite (shocked quartz), shatter cones, pseudotachylites, the KT boundary iridium layer, and elements common to space materials such as Iridium, Indium, and Scandium.

LOCATION AND SITE DESCRIPTION

The study site was located at the east end of Lake Wilson, Kansas and about 15 feet between a camper trailer and the Lake Wilson Marina (figure 1). A phone call from the Lake Wilson Park Service prompted a visit to a suspect 'hole' in the ground near Lake Wilson, Kansas. On first view, a few plant rootlets in the hole were given off wisps of smoke (figure 2).

Figure 1. Google Earth birds-eye view of suspect impact locale (arrow). Inset: East side of Lake Wilson, Kansas near marina.

Figure 2. Left to right: 'crater' hole with geologists rock hammer handle for scale. "The Day After" locals, Brad and Chris Nemnich along with Don and Debbie Lang, enjoy a brew while the surveys commenced.

METHODOLOGY

On September 9, 2006 a field investigation and a small 1-meter square survey was conducted at the site using a Geometrics G-858 cesium vapor magnetometer (figure 3). The one meter square area was excavated at 3-inch intervals from the surface to bedrock located at a depth of 12 inches. Vertical photos were taken at 3, 6, 9, and 12 inch intervals; and field samples were submitted for NAA analyses. Two field oriented bedrock samples of quartz sandstone were collected and thin sections were made for photomicrographic imaging. Magnetic data was downloaded and contoured in MagMapper 2000 (Geometrics Software) and interpreted using Breiner's (1973) method. Also, a hand magnet was swept over the pit at all intervals.

Figure 3. Left two: Magnetometer survey near marina and excavation. Right two: Vertical views at 3" depth and at 12" depth (note Dakota Sandstone bedrock).

FIELD OBSERVATIONS

No *in situ* evidence of meteorite impact-induced features such as tektites, shatter cones, pseudotachylites, nor lightning induced fulgarites were found within the excavated sediment nor in the sandstone bedrock such as those seen in figure 4 which are from other known impact sites in North America.

Figure 4. Left to right: tektites, shatter cones, pseudotachylites; and fulgarites.

MAGNETIC SURVEY, FIELD MAGNET, AND THIN SECTION RESULTS

The cesium vapor magnetic data provided the least information. Unfortunately, due to electrical interference and other fixed iron-bearing features (campers) within the marina campground, no anomalies were visible (figure 5). No magnetic minerals were picked up by a field hand magnet. Lastly, thin section analyses of 50-quartz grains in two different Dakota Sandstone samples did not exhibit shocked quartz.

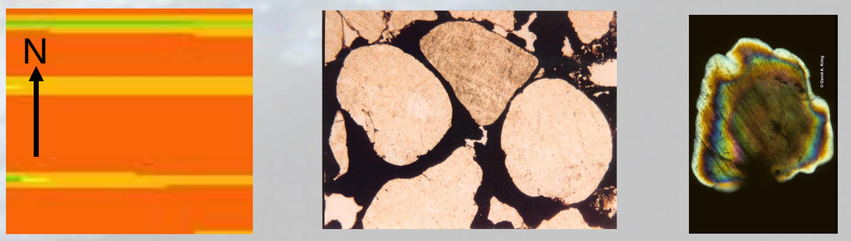

Figure 5. Left: MagMapper 2000 (Geometrics) anomaly map of the 1-meter square suspect area. The horizontal patterns were caused by buried and above ground electrical lines in the campground. Middle: photomicrograph of Dakota Sandstone bedrock thin section devoid of shocked quartz. Right: Image of real shocked quartz (Kring and Boynton, 1992) at the Chicxulub impact site is included for comparison.

NEUTRON ACTIVATION RESULTS

Neutron Activation Analysis (NAA) is a high-resolution gamma-ray spectrometer method used to detect "delayed" gamma ray 'counts' from artificially induced radioactivity in samples (figure 6). Bedrock and soil samples were sent to and analyzed by Dr. Akira Tokuhiro: Kansas State University, and then by Dr. Brian Porter at the University of Missouri (Rolla). Tokuhiro and Porter (Per. Comm.) indicated that Indium (In49), Scandium (Sc46), and Iridium (Ir77) spectra (8-day delayed counts with two different 'count windows') are possible but they are not 100% conclusive because of short half-lives and possible masking by other more common elements in the samples (Figure 7). Porter however indicated that Scandium is the most likely rare element. The NAA spectra did not indicate the presence of gun powder.

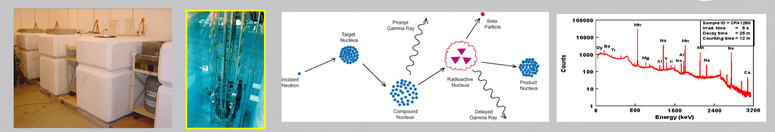

Figure 6 UMR NAA instruments with graphic of process and example spectrograph (Porter: Personal Communication).

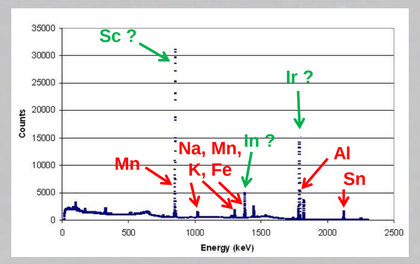

Figure 7 NAA Spectral Graph from Lake Wilson site:

OTHER RELATED INFORMATION

No gun shots were reported by campers or park officials.
Sky was clear and no lightning was heard or observed.
Local fisherman reported 'falling stars' the night before.
Most Perseid shower particles are sand-grain to pea size, most burn up in the atmosphere, and travel at speeds of 133,200 mph (https://www.amsmeteors.org/fireballs/faqf/

CONCLUSIONS

Based on personal communication with locals, field data, and from the NAA analyses, the 'feature' at Lake Wilson was not caused by a gun blast, was not caused from a large impact fragment, and was not caused by a lightning strike, but rather a small, sand-grain sized particle, traveling near 130,000 mph, during a Perseid meteor shower event, which vaporized on impact. Based on a symmetrical, circular, shallow depth 'crater', that the angle of impact was near vertical than at a low-angle (figure 8).

Figure 8. Kris Neuhauser making a 'field guestimate' of the on impact angle.

CLOSING COMMENT

Had any of the Nemnich's or Lang's family members been standing where the 'crater' was located (ground zero), they most likely would have experienced a hair-raising moment or probably would not be around to tell their story!

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