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**IS UPHEAVAL DOME'S CONTROVERSY OVER?**

FOR IMMEDIATE RELEASE  
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A.T. Dowd Research, Savannah, GA

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**Serendipity May End Utah's Geological Controversy**

Canyonlands NP, Moab UT -- "It's the first time I have appreciated what altitude sickness can do for someone." Said James Byous, archaeologist for A.T. Dowd Research in Savannah, Georgia. "I had to sit down to recuperate from its effects and literally sat on what I was looking for."

What he found in May of this year might help end a decades old controversy concerning Upheaval Dome in Canyonlands National Park near Moab. The dome is a bulls-eye shaped circle of sandstone cliffs twenty miles east of Moab Utah.

Byous studies Hertzian fractures - cone shaped cracks that form below dings in glass windshields, ceramics and many other similar materials. Upheaval Dome has many of the same features. The fractures are also seen in the grooves that make up the edges and points of primitive arrowheads and spear points.

Byous says that a slight bout with altitude sickness prevented his descent into the canyon below the structure. But when he joined a team member for a break under a small pinyon pine they discovered that the rock they were reclining against contained several small shatter cones along cracks and joints.

The small inverted "V" shaped features are found in meteor impacts and are one of two accepted indicators to identify an impact crater or structure.

Though the main trail is less than twenty feet away from the features, the typical angle of sunlight at the location and the size of the cones make them difficult for hikers to see. "We did not see them when we first walked past," Byous said.

"I thought we might find these features at the bottom of the long slope. But, I knew that I needed to take a break so we sat down.

"Serendipitous," he said. "I guess that would describe the find."

Upheaval Dome has a history of opinion and debate on the origin of the three-mile-wide structure.

In the early 20<sup>th</sup> century geologists believed it to have been created by a cryptovolcanic (hidden-volcanic) explosion. Later it was suspected that rising salt from the Paradox formation buried far below

forced the rock layers up into a dome shaped bulge in the landscape. Afterward erosional forces leveled the structure to its present profile.

Then, in the 1980s and '90s, geologists Eugene Shoemaker and Ken Herkenhoff studied the crater finding shatter cones in the crater along with planar fractures in quartz grains. Both features are only found in nuclear blasts and meteor impacts.

Shoemaker's report stated, "Reexamination of Upheaval Dome... shows that the structure of this remarkable feature conforms with that expected of a deeply eroded astrobleme." Astroblemes are remnants of impact craters.

Later, geologist Bryan Kriens released papers with Herkenhoff and Shoemaker after mapping and studying the dome.

Shoemaker, who died in 1997, was a founder of the field of planetary science and is known for his role in the discovery of Shoemaker-Levy 9, a comet that struck Jupiter in July 1994. Herkenhoff is currently known for his work on the robotic study of Mars.

As late as 2015 one geologic paper represented the salt diapir claim. The authors downplayed the findings of Shoemaker and the others describing the evidence as "sparse". Today the National Park Service still presents both hypotheses in information on the structure.

The newly found shatter cones differ from the previous find in that they are slightly more pronounced and are located outside of the crater along the Syncline Loop Trail as it drops over the top southern slope three-quarters of a mile away from the original site.

"Finding these features was paradoxical," said James Byous, Chief Research Associate for A.T. Dowd Research in Savannah, GA. "It was suspected that shatter cones might be in the area from our studies on glass, but we expected that they would be found lower down the slope," he said. "It turned a bad day into a very good day."

Byous added, "In light of evidence that in human history no nuclear blasts have occurred at this location the impact origin of Upheaval Dome seems to be correct."

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For report and image downloads go to: <http://www.dowdresearch.org/Upheaval-Dome-Shatter-Cones.html>.

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## References

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