Electric Discharge - Not an Impact Caused Formation Of Upheaval Dome, Canyonlands National Park, Utah

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ABSTRACT

This paper will provide an argument that Upheaval Dome, Canyonlands National Park, Utah, USA is a product of Electrical Discharge Machining (EDM). Currently two theories remain from a myriad of possible theories for the site's formation, the first being a prehistoric salt diapir, or dome that has completely eroded away; the second theory being that of impact origin from either a meteor or even a comet. This paper will provide evidence for a more plausible theory that electric discharge can provide the temperatures and forces necessary to shock quartz crystals similar to those found in meteorites and other tektites. Experimental evidence will be provided from an individual who uses a low-pressure chamber to form cratering patterns and demonstrates Transient Lunar Phenomenon (TLP), or moon flashes, without impacts. Information will be given on fulgurites, or rocks formed from lightning and are melted into glass. Also, how this vitrification mechanism can be attributed to a new form of the mineral analcime, commonly called the Obsession Stone, which is considered as possible ejecta from the Upheaval Dome site.

Keywords*: Analcime, Crater Geophysics, Impact Craters, Upheaval Dome, Utah, Electric Discharge Machining, Stellar Transformer*

Key Points

1. Upheaval Dome is a geological site having two possible theories of formation. The first being a salt diapir that has eroded away, the second theory an impact site.
2. The second theory currently has most support due to the discovery of specimens containing shocked quartz.
3. Recent discoveries have shown that lightning can shock quartz in simulations. Perhaps a better crater forming mechanism should be considered.

1. INTRODUCTION

Upheaval Dome is an anomalous geological formation inside Canyonlands National Park, Utah, USA. The formation is 5.5 Km across the outer rim and over 500 m to the floor's core. A writer for the Utah Geological Survey, William Case, writes about the site, "Upheaval Dome in Canyonlands National Park, Utah, is a colorful circular 'belly button,' unique among the broad mesas and deep canyons of the Colorado Plateau" [1]. He continues with, "Since the late 1990s, the origin of the Upheaval Dome structure has been considered to be either a pinched-off salt dome or a complex meteorite impact crater; in other words the 'belly button' is either an 'outie' (dome) or 'innie' (crater)" [1]. After visiting Upheaval Dome with Dr. Eugene Shoemaker in 1996, this paper's author was of the mind that "impact" was the better model after Dr. Shoemaker took the time to share some of his findings. However, recently presented information on the subject of electricity forming craters, causing surfaces of materials to become vitrified, and a form of the mineral analcime that is said to "resemble devitrified glass" [2] found just outside of Canyonlands National Park caused this author to research the possibility that Upheaval Dome (Fig. 1) was created by some massive electrical event. This paper will present evidence of a more plausible theory that electric discharges created the temperatures and pressures necessary to form the crater, vitrify material, shock quartz, and then eject the fused clays from the site.

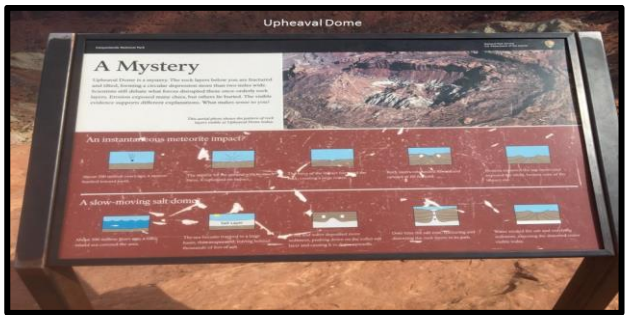

Figure 1: Upheaval Dome in Canyonlands National Park in Utah according to signs has 2 competing theories.

Salt Diapir Theory of Upheaval Dome

According to a geologist from the University of Texas, M. P. A. Jackson, and his team with regards to the pinched off salt dome theory state, "We propose that an overhanging diapir of partly extrusive salt was pinched off from its stem and subsequently eroded. Many features support this inference, especially synsedimentary structures that indicate Jurassic growth of the dome over at least 20 [million years]", [3]. They continue, "We infer that abortive salt glaciers spread from a passive salt stock during Late Triassic and Early Jurassic time. During Middle Jurassic time, the allochthonous salt spread into a pancake-shaped glacier inferred to be 3 km in diameter" [3]. This theory has less support because any evidence for the salt diapir was washed away. Further evidence from Bryan Kriens of Brigham Young University along with Shoemaker (posthumously) give the evidence of, "the top of the underlying salt horizon is at least 500 m below the surface at the center of the dome, and there are no exposures of salt or associated rocks of the Paradox Formation in the dome to support the possibility that a salt diapir has ascended through it" [4]. This shows that the salt dome theory is losing support.

Impact Theory of Upheaval Dome

An impact theory also exists for the formation of the site. Shoemaker writes in his paper that he, "earlier supported the crypto volcanic theory on the basis of deformation observed near the center of the dome and the results of geophysical surveys" [5]. However over two decades, he found the evidence supporting the impact theory to be more "compelling" [5]. Kriens states in his later paper, "planar microstructures in quartz grains, fantailed fractured surfaces (shatter surfaces), and rare

shatter cones are present near the center of the structure" [4]. A visit to Upheaval Dome by this paper's author with Dr. Shoemaker allowed seeing these finding in situ. Shoemaker explained that these shocked quartz grains were the telltale sign for impact material. At the time, this theory seemed to be the most supported; however the unresolved issue of what caused the sample of analcime to be in a vitrified state without solid evidence of being impact material, caused further research for a mechanism that could produce all of these features.

2. ELECTRICAL DISCHARGE HYPOTHESIS

In August 2017, the author was invited to the *Electric Universe: Future Science* conference where he was introduced to several hypotheses of how Electrical Discharge Machining (EDM) affects geological surfaces. At this conference the author was able to discuss with Wallace Thornhill, co-founder of the *Thunderbolts Project*, which hosted the conference, one of these theories [6]. Thornhill discussed with the author possible similarities of how electrical scarring is visibly noticeable on both the surfaces of the American Southwest and the Valles Marineris structure on Mars [6]. Photographer Michael Steinbacher also investigated Upheaval Dome, and seems to be the first investigator to follow up on this electric discharge hypothesis with field investigations of electrical geological processes on Earth's surface [7]. Creation of Upheaval Dome by a vertical arc electrical filament forming a geological crater is only a small part of the larger "Arc Blast" of an interplanetary lightning strike (static electricity or plasma event). When considering the larger concept of EDM applications to interplanetary lightning that strips a planet of crustal material as proposed by Thornhill, the following contrast with Plate Tectonics is proposed for the American Southwest.

One appeal of the interplanetary lightning and EDM concept is that it easily explains some problems in plate tectonics such as: 1.) The power needed to thrust up mountain ranges is difficult to justify with simple mantle convection/upwelling as a driver, but a shorted north-south global mantle circuit (Fig. 2) during an electric discharge should have the necessary power for uplifting north-south mountain chains for example the Andes and Rockies. Experimentalist David Brown demonstrates this uplifting theory in a lab in his video where he applies a current to a wet clay [8].

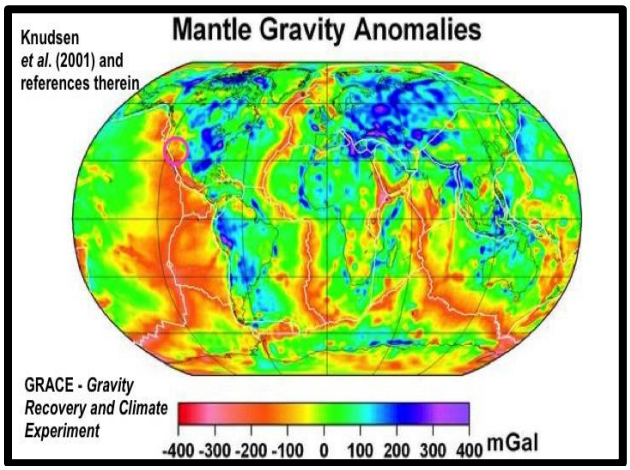

Figure 2: Mantle Gravity signature portrays 4 global north-south polar connected electrical circuits with telltale heat signatures indicated in Fig. 3. The ancient Farallon Volcano in Fig. 4 lies along the East Pacific Rise (EPR) trend (circled pink).

2.) The relatively young age of the seafloor, stated as ~200 million years by plate theory, relative to the ancient age of continents up to 4.5 billion years may be more easily explained by a more recent melting of the lithosphere during electrical carve outs of global ocean seafloors from a series of electrical discharge events which reset the magnetic ages by reaching Curie temperatures, i.e. resetting the magnetic age during recrystallization. 3.) It also could make sense the asteroid belt is remnants of Earths blown out crust and mantle if the earth-sun system is considered as a *Stellar Transformer* [9] with a few blown circuits (Fig. 2 & 3). Color variations contrasted by orange and blue on Mantle Gravity map (Fig. 2) delineates the trend of the "Double Layer" or "Cathode (orange)/Anode (blue) short circuit relationships and delineates a South Pole to North Pole "HOT" mantle circuit along the East Pacific Rise (EPR) in Fig. 3.

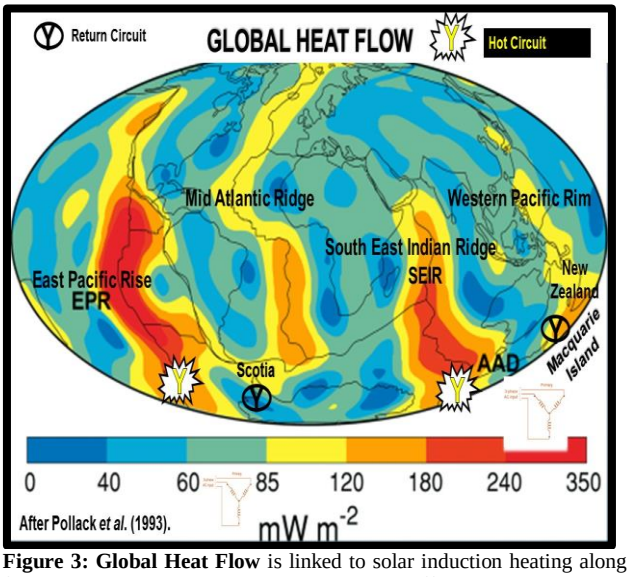

Figure 3: Global Heat Flow is linked to solar induction heating along four main tectonic ridges. Hypothetically this effect alternatively heats the Southeast Indian Ridge (SEIR) when the Interplanetary Magnetic Field (IMF) is positive, and then shifts to the East Pacific Rise when IMF turns negative, modified after (Pollack et. al., 1993).

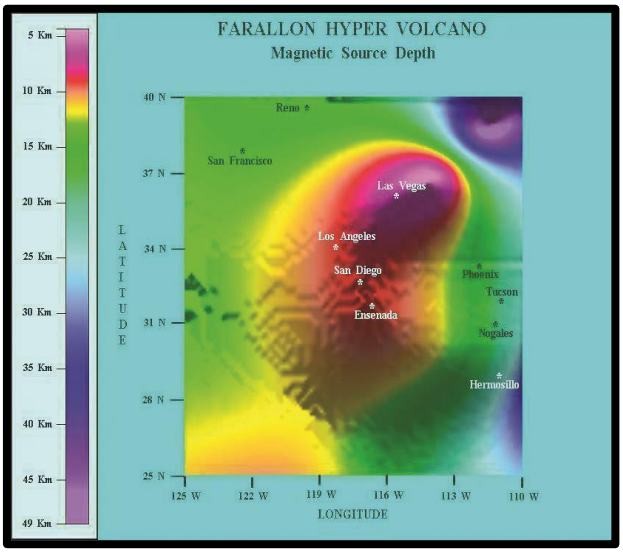

Figure 4: Geomagnetic Source Depth of the ancient Farallon Hyper-Volcano [10, 11] caldera trend is aligned with a series of known mining towns and sits along the north-south electrical polar circuit on the East Pacific Rise trend (See circled pink in Fig 2).

To conceptualize the electric discharge effects on Earth's environment, *"Earth as a Stellar Transformer"* [9] provides a geophysical framework for an interpretation of planetary circuit geometry that fits the electric discharge model. The EPR circuit intersects the southwestern corner of the North American continent where the dendritic Colorado and Green river systems empty into the Gulf of California coincident with the San Andreas Fault system, as an extension of the EPR. The author with the aid of Leybourne hypothesize this is evidence of a more recent electric discharge carve out of the Grand Canyon and related river systems that generally following fault systems related to circuits of the discharge. The cusps of the Grand Canyon in many places seem more related to a blown out excavation than erosion, as evidenced by cusps with no stream flowing into them and sharp jagged fragments littering the environment indicating lack of normal erosional components at work that slowly break down the rock into smoothed rounded surfaces. The magnetic anomaly in Fig. 4, the Farallon Hyper-Volcano [11] directly underlies the Grand Canyon, is proposed to have blown out as the result of electrical discharge after the manner of Mt. Sakurajima [12]. A statement from a 2016 paper on volcanic lightning suggests, "Volcanic lightning occurs in eruptive plumes as a result of the electrification of ash. Evidence is mounting that electrification is a common process in explosive eruptions in the form of a growing number of volcanic lightning reports from recent eruptions" [12]. Farallon is called a hyper volcano because it is an order of magnitude larger than the Yellowstone Super Volcano. A detailed look at Fig. 4, annotates various cities along the shallower trends of the Farallon volcano rim. Starting near Las Vegas the magnetic anomaly is 1 Km to 2 Km deep. The Base of the Farallon volcano is approximately 12 Km Deep. Thus, the height of the volcano from its base to its rim is approximately 10 Km, the diameter of the volcano's rim is approximately 555 Km in the north-south direction. The diameter of its base in the north-south direction is about 1200 Km, the eastern portion of this volcano appears to have been blown away during an eruption, or possibly was involved in a landslide. This proposed volcano caldera is not yet dated. However, given the geologic history of the southwest United States and North-western Mexico, suggests this volcano erupted during the Laramide Era 65 Ma +/- 15Ma [9].

Subsequent arc blast excavating the Grand Canyon likely occurred much later during the 12,900 year ago North American Mega-faunal extinction event [13]. Peter H Schultz, a planetary geologist from Brown University stated in a paper he participated in, "We now report substantial additional data from multiple well dated stratigraphic sections across North America supporting a major ET airburst or collision near 12.9 ka. Directly beneath the black mat, where present, we found a thin, sedimentary layer (usually <5 cm) containing high concentrations of magnetic microspherules and grains, nanodiamonds, Iridium (Ir) at above background levels, and fullerenes containing ET helium. These indicators are associated with charcoal, soot, carbon spherules, and glass-like carbon" [14]. Upheaval Dome could simply be a blister on Earth's surface caused by an electric arc filament separated from the main arc current, which goes vertically to ground. The remnant sandstone arches within Arches National Park could also have been formed electrically. Although the electrical discharge explanation is speculative and the scale is very different, the underlying logic appeals to a common-sense approach [11].

3. MATERIALS AND METHODS

Fulgurites

Robin Andrews writes in *Forbes*, "Lightning is ludicrously energetic, with the average lightning strike estimated to involve one billion joules of energy . . . with that kind of energy and with temperatures exceeding 2500^{o} C, you'd expect that it can do some damage to pretty much whatever it ends up striking" [15]. Andrews later adds, "Despite the sudden temperature spike, the targets do cool off relatively rapidly, which means that the melted minerals don't have much time to rearrange themselves. This normally means that the texture of these once-melted segments is often amorphous and glassy. These deposits, dear readers, are what we call fulgurites" [15]. In Kimberly Genareau's open-access paper for *Geology*, her team proposes, "for the first time, a mechanism for the generation of glass spherules in geologic deposits through the occurrence of volcanic lightning. The existence of fulgurites… provides direct evidence that geologic materials can be melted via natural lightning occurrence" [16].

The Obsession Stone

In 1996, discoverer James "Wes" Hill of Moab, Utah and marketer Robert Hawthorne, Sr. presented a strange rock (Fig. 5) to local geologists for identification. They believed the stone was connected with the Upheaval Dome site in Canyonlands National Park, but wanted more information to assure its value. After contacting scientists from Brigham Young University and University of Utah, they were unable to identify the rock. Hawthorne Sr. sought out some of the nation's leading scholars on meteors.

Figure 5: Polished Sample of Obsession Stone used in X-ray Diffraction [2].

He caught the attention of Dr. William Cassidy of the University of Pittsburgh. Cassidy had never seen anything like this rock before. After examining a specimen he writes in his letter, "Preliminary observations are that it consists primarily of irregular shaped, colorless grains of isotropic material, accompanied by rare rounded isotropic grains. Both the irregular and rounded isotropic grains are probably glass" (Fig. 6) [17]. Sometime after that, Cassidy was still unsatisfied with the previous attempts to identify the rock after three visits to the Smithsonian Institute. He referred Hawthorne Sr. to Mike Zolensky, curator of NASA's cosmic dust collection. An x-ray diffraction test [2] (Tables 1, 2, 3 and Figs. 5 and 7) was conducted and compared to the numerous standards available. The results came back that the sample was a mineral known as analcime ($NaAlSi_2O_6$ * H_2O), with traces of calcite [2].

Figure 6: 10x Magnification showing "rounded" grains of glass and filaments in the top right corner.

Cassidy wrote at the end of his letter [17] on his results after examining the analcime sample from Upheaval Dome, "the specimen is different from other impact glasses, such as those associated with [other] craters. Therefore, while it seems possible that this material is of impact origin, one would have to suggest the likelihood that it has undergone some type of secondary processing and sorting to remove associated nickel-iron inclusions before lithification. Pending further chemical analyse of individual grains, we cannot commit ourselves further to its possible impact origin" [17]. Zolensky concludes in his letter [2] in a similar unresolved fashion, "These secondary minerals have completely replaced the original mineralogy of the samples, so there is just no telling what they originally were. The gross petrography does resemble devitrified glass, but this could have been a volcanic glass" [2]. An International Geo Sample Number (IGSN IERFH0001) was registered in 2019.

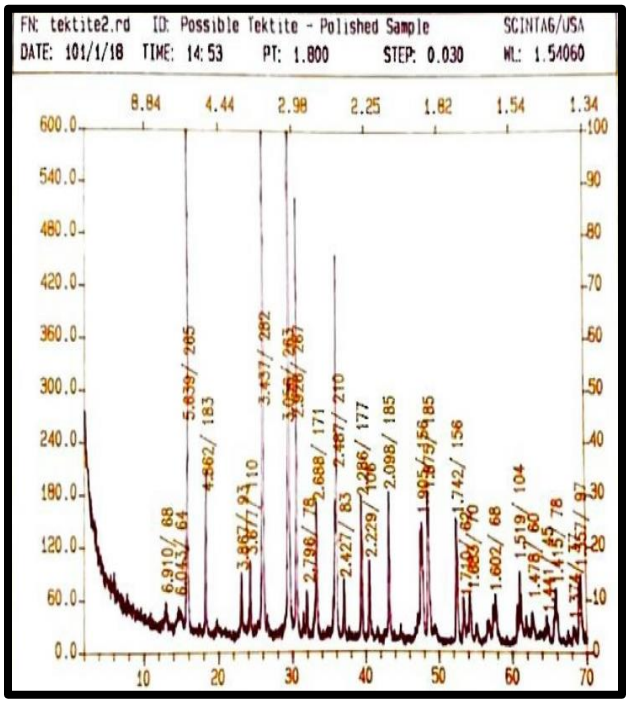

Table 1: X-ray diffraction results of polished sample (Fig. 5) [2].

PEAKFINDER RESULTS FOR SAMPLE :
Possible Tektite - Polished Sample
ON FILES : TEKTITE2
WAVELENGTH IN USE : 1.54060

#	2TH-COR	D-COR	CPM	FWHM	PK-INT	H	K	L	2TH-OBS	DEL-2TH
1.	15.791	5.6075	35636	.120	4094.	0	0	0	15.791	.000
2.	18.261	4.8543	6926	.180	1060.	0	0	0	18.261	.000
3.	23.058	3.8542	2695	.180	412.	0	0	0	23.058	.000
4.	24.245	3.6681	3214	.180	369.	0	0	0	24.245	.000
5.	25.944	3.4315	60617	.120	9285.	0	0	0	25.944	.000
6.	29.441	3.0315	125368	.090	14403.	0	0	0	29.441	.000
7.	29.659	3.0096	3637	.120	696.	0	0	0	29.659	.000
8.	30.529	2.9258	22342	.090	3422.	0	0	0	30.529	.000
9.	31.919	2.8015	2223	.180	340.	0	0	0	31.919	.000
10.	33.258	2.6917	7130	.120	1092.	0	0	0	33.258	.000
11.	35.810	2.5055	6913	.090	1588.	0	0	0	35.810	.000
12.	35.998	2.4929	20235	.120	2325.	0	0	0	35.998	.000
13.	37.039	2.4252	2694	.180	412.	0	0	0	37.039	.000
14.	39.438	2.2830	7655	.120	1172.	0	0	0	39.438	.000
15.	40.492	2.2260	4160	.120	637.	0	0	0	40.492	.000
16.	43.198	2.0926	8118	.090	933.	0	0	0	43.198	.000
17.	47.565	1.9102	5787	.120	886.	0	0	0	47.565	.000
18.	47.765	1.9026	3636	.120	1079.	0	0	0	47.765	.000
19.	48.566	1.8731	7914	.150	1515.	0	0	0	48.566	.000
20.	48.740	1.8668	3297	.150	757.	0	0	0	48.740	.000
21.	52.472	1.7425	7291	.120	1396.	0	0	0	52.472	.000
22.	53.388	1.7147	2463	.120	565.	0	0	0	53.388	.000
23.	54.260	1.6892	2658	.210	610.	0	0	0	54.260	.000
24.	57.462	1.6025	1639	.150	492.	0	0	0	57.462	.000
25.	57.764	1.5948	2654	.150	508.	0	0	0	57.764	.000
26.	60.724	1.5240	1958	.240	299.	0	0	0	60.724	.000
27.	61.101	1.5155	3759	.090	576.	0	0	0	61.101	.000
28.	65.935	1.4156	2786	.150	640.	0	0	0	65.935	.000
29.	69.083	1.3585	3423	.150	1049.	0	0	0	69.083	.000
30.	69.290	1.3550	2419	.120	463.	0	0	0	69.290	.000

#	2THETA	D	I
6.	29.441	3.0315	100
5.	25.944	3.4315	48
1.	15.791	5.6075	28
8.	30.529	2.9258	18
12.	35.998	2.4929	16
16.	43.198	2.0926	6
19.	48.566	1.8731	6
14.	39.438	2.2830	6
21.	52.472	1.7425	6
10.	33.258	2.6917	6
2.	18.261	4.8543	5
11.	35.810	2.5055	5
17.	47.565	1.9102	5
18.	47.765	1.9026	4
15.	40.492	2.2260	3
27.	61.101	1.5155	3
7.	29.659	3.0096	3
29.	69.083	1.3585	3
20.	48.740	1.8668	3
4.	24.245	3.6681	3
28.	65.935	1.4156	2
3.	23.058	3.8542	2

Table 2: X-ray diffraction results of polished sample (Fig. 5) [2].

13.	37.039	2.4252	2
23.	54.260	1.6892	2
25.	57.764	1.5948	2
22.	53.388	1.7147	2
30.	69.290	1.3550	2
9.	31.919	2.8015	2
26.	60.724	1.5240	2
24.	57.462	1.6025	1

Table 2 (continued)

PEAKFINDER RESULTS FOR SAMPLE :
TEKTITE SAMPLE??? - ROUND
ON FILES : TEKTITE
WAVELENGTH IN USE : 1.54060

#	2TH-COR	D-COR	CPM	FWHM	PK-INT	H	K	L	2TH-OBS	DEL-2TH
1.	15.879	5.5766	26596	.120	3055.	0	0	0	15.879	.000
2.	18.349	4.8312	4999	.120	765.	0	0	0	18.349	.000
3.	23.213	3.8287	3516	.120	538.	0	0	0	23.213	.000
4.	24.326	3.6560	2375	.120	272.	0	0	0	24.326	.000
5.	26.031	3.4203	44102	.120	6755.	0	0	0	26.031	.000
6.	29.627	3.0128	91611	.090	14033.	0	0	0	29.627	.000
7.	30.618	2.9175	19087	.090	2924.	0	0	0	30.618	.000
8.	32.005	2.7942	2148	.150	329.	0	0	0	32.005	.000
9.	33.352	2.6844	5875	.120	899.	0	0	0	33.352	.000
10.	35.907	2.4990	5221	.180	799.	0	0	0	35.907	.000
11.	36.171	2.4813	4528	.180	1040.	0	0	0	36.171	.000
12.	37.110	2.4207	2278	.210	348.	0	0	0	37.110	.000
13.	39.646	2.2715	5618	.120	1290.	0	0	0	39.646	.000
14.	40.587	2.2210	2885	.210	441.	0	0	0	40.587	.000
15.	43.415	2.0826	7188	.120	1926.	0	0	0	43.415	.000
16.	47.845	1.8996	9033	.120	2421.	0	0	0	47.845	.000
17.	48.812	1.8642	8819	.120	2364.	0	0	0	48.812	.000
18.	52.554	1.7400	6502	.120	956.	0	0	0	52.554	.000
19.	53.456	1.7127	2179	.120	333.	0	0	0	53.456	.000
20.	54.346	1.6867	2250	.210	344.	0	0	0	54.346	.000
21.	57.728	1.5957	2785	.120	746.	0	0	0	57.728	.000
22.	57.792	1.5941	2805	.120	751.	0	0	0	57.792	.000
23.	62.828	1.4779	1482	.150	227.	0	0	0	62.828	.000
24.	66.034	1.4137	3048	.210	584.	0	0	0	66.034	.000
25.	69.159	1.3572	2989	.210	572.	0	0	0	69.159	.000

#	2THETA	D	I
6.	29.627	3.0128	100
5.	26.031	3.4203	48
1.	15.879	5.5766	29
7.	30.618	2.9175	21
16.	47.845	1.8996	10
17.	48.812	1.8642	10
15.	43.415	2.0826	8
18.	52.554	1.7400	7
9.	33.352	2.6844	6
13.	39.646	2.2715	6
10.	35.907	2.4990	6
2.	18.349	4.8312	5
11.	36.171	2.4813	5
3.	23.213	3.8287	4
24.	66.034	1.4137	3
25.	69.159	1.3572	3
14.	40.587	2.2210	3
22.	57.792	1.5941	3
21.	57.728	1.5957	3
4.	24.326	3.6560	3
12.	37.110	2.4207	2
20.	54.346	1.6867	2
19.	53.456	1.7127	2
8.	32.005	2.7942	2
23.	62.828	1.4779	2

Table 3: X-ray diffraction results of round sample (Fig. 14) [2].

Figure 7: Round Sample of Obsession Stone used in X-ray Diffraction [2].

Filaments

A strange feature that has been observed in a few specimens are what appears to be glassy filaments woven through the isotropic spheres, a seen in the top right corner of Figure 6. Another sample was found with seems to be a blue colored filament or string (Figs. 8, 9, and 10). In the opinion of the author the possibility of an impact fusing material into this peculiar form of analcime is a rare chance in itself. To have such fragile and tiny filamentary structures within the material, especially when extremely high temperatures and pressures would have been present, would be extremely rare. In such conditions the possibility of the material fusing together into perhaps more isotropic grains should have occured.

Figure 8: Image of Filament in analcime sample 2x magnification.

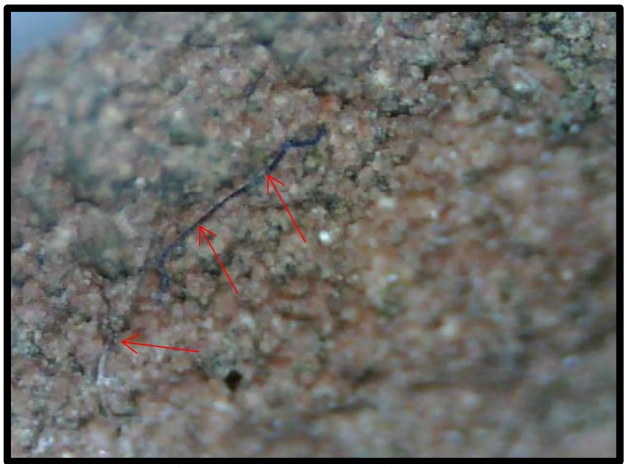

Figure 9: Image of Filament at 4x magnification. Here one starts to see how the filament is woven into the isotropic grains. Another filament appears on the bottom of pic or could be the same one.

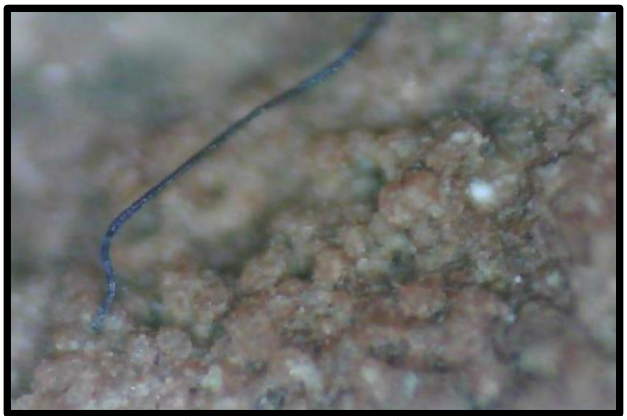

Figure 10: Image of Filament at 10x magnification.

Electrical Cratering

Electrical discharge in the form of lightning has been documented to form craters. In Fort Worth, Texas, Fire Department officials reported in its's Twitter account on October 30, 2019 that lightning left a crater inside the parking lot of a gasoline station. Department Spokesperson Mike Drivdahl stated, "When it's 15-by-15 (ft.), and concrete 6 inches thick, that's a pretty massive explosion" [18]. In another example, Clay Thompson writes, "according to *Scientific American*, a lightning bolt in 1856 near Kensington, N.H., made a crater about a foot wide and 30 feet deep" [19]. He continues with another incident reportedly "8 inches in diameter and 15 feet deep" [19]. These examples have shown that lightning can burrow deep, but can it form wide craters as well? The author sought to investigate this question. An experimentalist named Jacob Gable, in a YouTube video interview the author co-produced called *The Electric View*, demonstrates cratering formed in the pictures below (Figs. 11 & 12) by electrical discharge in a small low pressure chamber partially filled with dirt and sand from outside his house. He uses a cathode at the top and an anode being a nail inserted in the bottom [See: YouTube video 20]. His experiments, in the opinion of the author, have formed craters similar to those on the moon, where craters appear inside on the rims of other craters (Fig. 11) and has even demonstrated Transient Lunar Phenomenon (TLP's), or moon flashes, which have been observed yet are attributed to impacts (Fig. 12) [20].

Figure 11: Screenshot of Electrical Rim within rim cratering [20].

Figure 12: Gable Screenshot resembling moon flashes [20].

Another experimentalist, David Brown from the *YouTube* channel *ElectricUniverse Eyes*, demonstrates electrical cratering on terra cotta samples shaped into spheres or slabs [21]. Unlike Gable's work however, Brown's are not enclosed in a low pressure chamber. He uses a neodynium magnet wrapped in copper wire. A 3000 V power source generates a current which is passed through the magnet into the clay ball (Figs. 13 and 14), the clay material is heated and then etched leaving a crater in the material [21].

Figure 13: Screenshot of Brown initiating EDM experiment on clay ball [21].

Figure 14: Screenshot of Brown's experiment demonstrating EDM cratering [21].

The results of these experiments in the opinion of this author provide sufficient support that electrical discharge can form craters. These experiments also show that EDM can form craters in atmospheric conditions as well as in low pressure. Given the numerous craters on the moon and other celestial bodies, perhaps EDM should be considered as a mechanism for creating such features.

4. SHOCKED QUARTZ IMPACT VS. ELECTRICITY

In 2008, a paper written by Buchner and Kenkmann states, "we document, for the first time, shocked quartz grains from this crater in sandstones of the Jurassic Kayenta Formation. The investigated grains contain multiple sets of decorated planar deformation features. Transmission Electron Microscopy (TEM) reveals that the amorphous lamellae are annealed and exhibit dense tangles of dislocations as well as trails of fluid inclusions. The shocked quartz grains were found in the periphery of the central uplift in the northeastern sector of the crater, which most likely represents the cross range crater sector" [22]. However, geologists have discovered in 2015 that lightning impacts form shattered quartz, tektite-like rock and other features previously thought only caused by meteor impact. Reto Giere, a mineralogist from the University of Pennsylvania, and his team ran simulations where "a moderately strong bolt of cyber lightning struck the virtual rock, it created pressure waves that peaked at about 70,000 atmospheres, well into the range needed to produce shocked quartz" [23]. Matthew Pasek, a geochemist at the University of South Florida in Tampa who was not involved in the study was quoted, "The result could cast further doubt on claims of asteroid impacts in Argentina and Australia that relied on observations of shocked quartz. The analysis should serve as a warning to geologists not to rely only on that line of evidence…This definitely shows that geologists need to consider the geological context of their samples", in Sid Perkin's article [24]. To further elaborate on the similar anomalies in Argentina and Australia, H. J. Melosh writes, "More enigmatic occurrences include the Edeowie glasses in Australia, which are attributed to an impact [25], but for which no evidence of a crater exists, and glasses from the Argentine

Pampas [26] that, if taken at face value, would imply impact rates vastly higher on the Pampas than anywhere else on Earth [27]. Could these latter two reports really be reflecting lightning strikes, rather than meteorite impacts?

5. RESULTS

Scanning Electron Microscopy (SEM)

The previously shown images of Brown and Gable illustrate that electrical discharge machining could have worked on multiple layers of strata in the dome simultaneously and could have accounted for the secondary processing mentioned in the NASA letter [2]. According to the evidence presented, electrical discharge, perhaps in the form of lightning, is the only mechanism that can account for all of these phenomena. The author was given the opportunity to use the scaning electron microscope at Salt Lake Community College's Microscopy lab, in Salt Lake City, Utah. Two samples were taken similar to the specimens described in the x-ray diffraction test performed by NASA (Figs. 5 and 7). The samples were prepared for analysis (Fig. 15), one similar in color to the polished sample (Fig. 5) and another that is brown in color and similar to the rounded sample (Fig. 7). Many scanned images were taken, some of the most interesting images though are provided (Figs. 16 – 21) and (Tables 4 and 5). The author felt these were most interesting because there has been no evidence found explaining the impurities found in the samples. Two full samples are provided with analysis, one analysis of the brown analcime sample while the other is an analysis of the purple sample. The first image of each sample was taken at 1000x magnification and gives a general topography of the sample. The second image is an Energy Dispersive X-ray Spectroscopy (EDS) table of the composition of the material. Here the spectral lines of the elements which compose this material are measured and recorded. The third image shows the composition of the material at the surface. The fourth and final image is the distribution of each specific element throughout the surface of the analyzed surface.

Figure 15: Analcime Scanning Electron Microscopy (SEM) samples. Purple analcime (left) and brown analcime (right).

Brown Analcime Sample Results

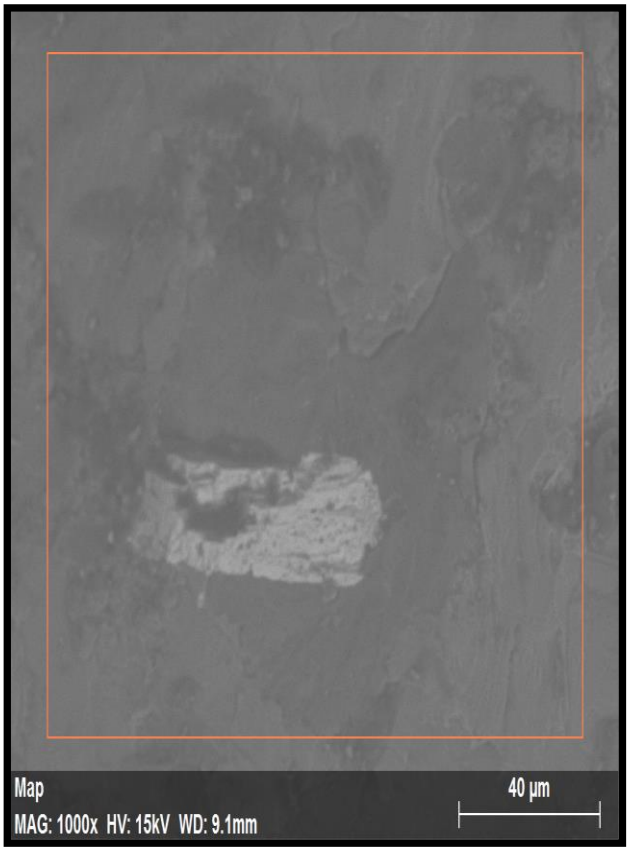

Figure 16: SEM image of brown analcime sample.

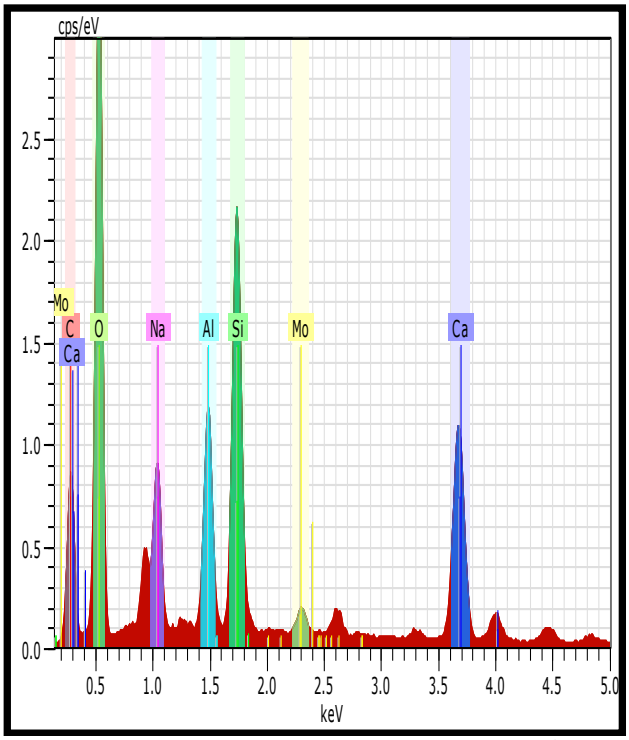

Table 4: Electron Dispersive X-ray Spectroscopy (EDS) of brown analcime sample.

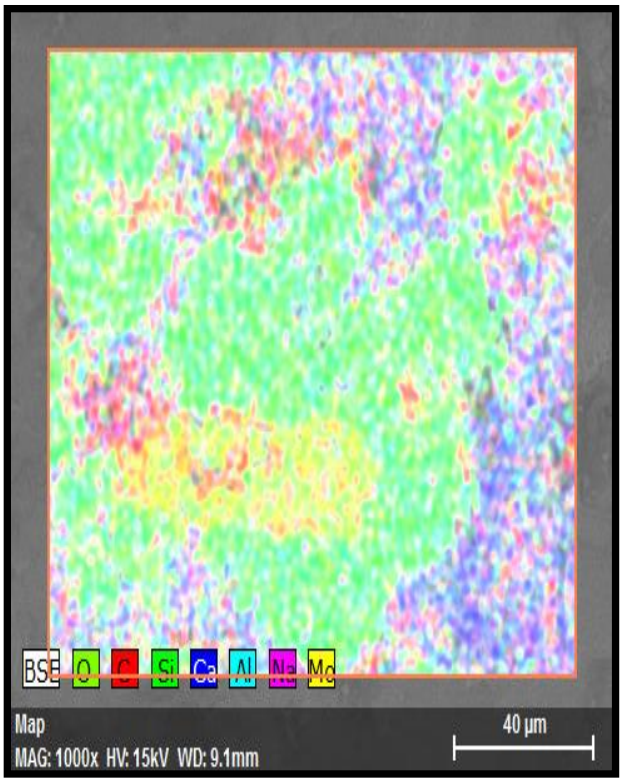

Figure 17: SEM composition brown analcime sample.

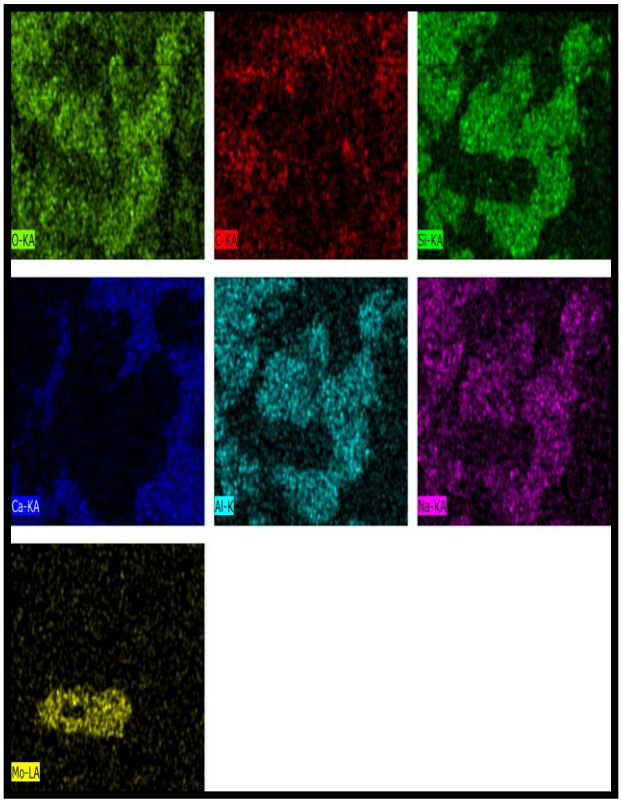

Figure 18: SEM composition of brown analcime sample.

Purple Analcime Sample Results

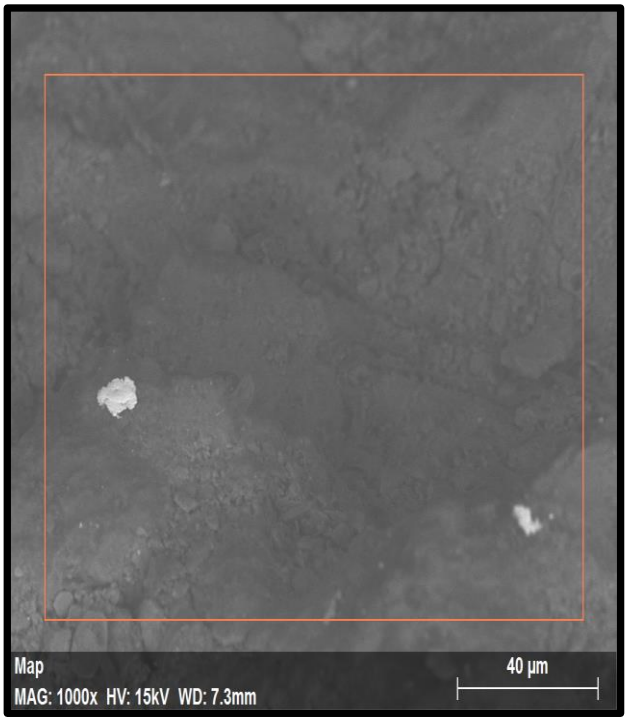

Figure 19: SEM image of purple analcime sample.

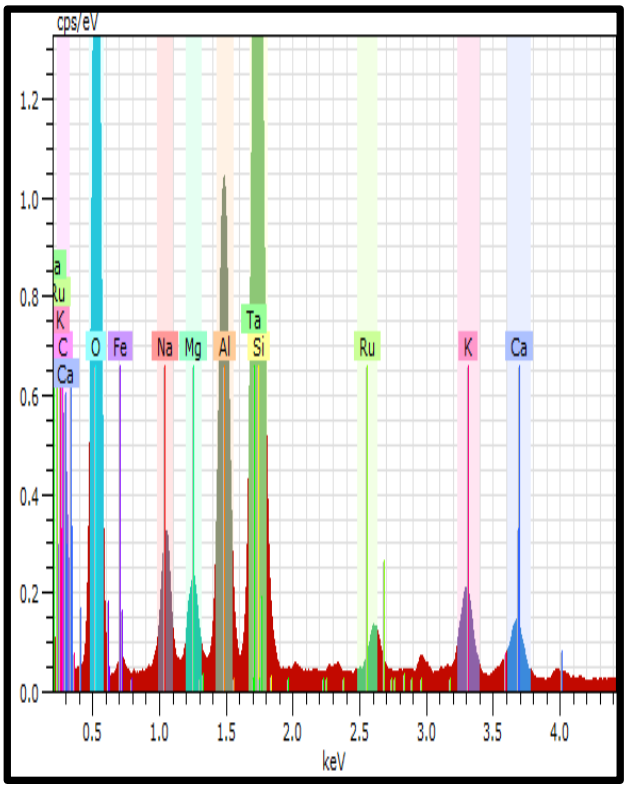

Table 5: Electron Dispersive X-ray Spectroscopy (EDS) of purple analcime sample.

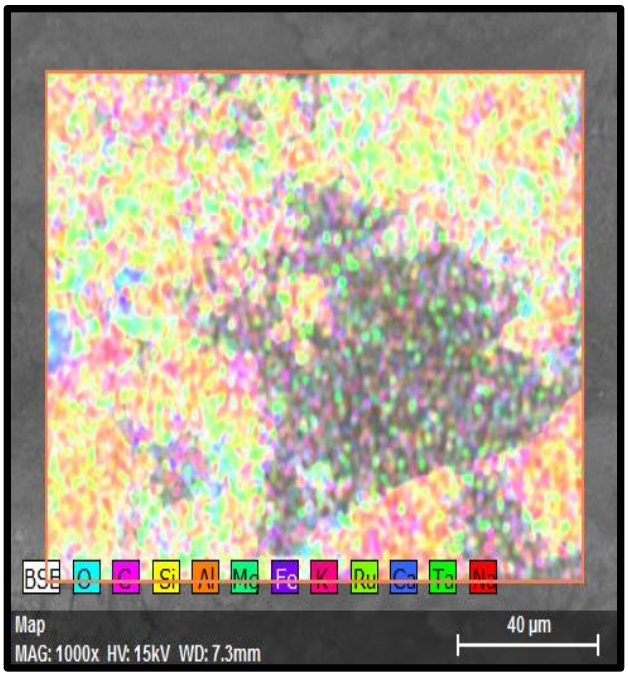

Figure 20: SEM composition purple analcime sample.

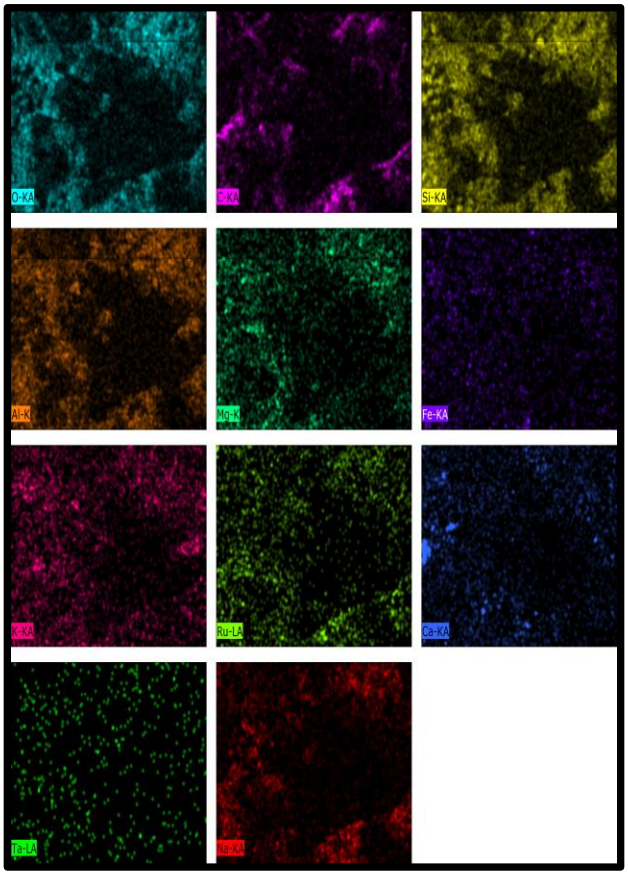

Figure 21: SEM composition of purple analcime sample.

6. CONCLUSIONS

Scientists have established through consensus that only impacts can create the necessary temperatures and pressure needed to form craters and shock quartz. Upheaval Dome has recently been accepted as an impact crater due to findings of shocked quartz in specimens in the center of the dome [4] and its perimeter [5]. However, observed simulations from the University of Pennsylvania have shown that lightning can also produce the temperatures and pressures required to shock quartz [23]. Geochemist Matthew Pasek of the University of South Florida was quoted, "The analysis should serve as a warning to geologists not to rely only on that line of evidence" [24]. Evidence has been provided through Jacob Gable's experiments that electrical discharge can form craters [20]. These craters formed in his lab strikingly resemble craters formed on the moon and transient lunar phenomenon. This paper has provided information on a glass like stone of the mineral analcime discovered just outside of Upheaval Dome, yet could not be verified as impact material [17]. This sample of analcime is possibly made of volcanic glass [2]. This paper provided information on how volcanic lightning has been shown to form glass out of the ashes [16]. All of the scientists involved agree the stone is unique, but they could not identify what caused this mineral to take its peculiar glassy form. Perhaps the controversy behind the formation of Upheaval Dome should be reconsidered for a theory that electric discharge machined the crater and left evidence in the form of samples containing shocked quartz, and other vitrified material in the surrounding area that originated as aluminum-silicate clays currently within Upheaval Dome. In other words analcime was ejected from an electrical filament strike creating the crater.

7. ACKNOWLEDGEMENTS

- The author would first like to disclose a financial conflict of interest as the author has invested time and money into selling the Obsession Stone for its rarity and beauty. An acceptable story as to how this mineral was formed would aid in those sales.

- The author would like to thank the following for their contributions to this paper. First my wife, Jackie Hawthorne, for all her patience and support. Second, thanks go to my father, Robert Sr., Bruce Leybourne, founder of the *IASCC*, and Andrew Hall, contributor to the *Thunderbolts Project* (Thunderbolts.info) and writer on *Daily Plasma* (DailyPlasma.org), for their contributions in electric geology theory. Thanks with proofreading this paper go to Shifu Ramon Careaga, Buddy Dougherty, David Johnson, and Gareth Samuel.

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Bob Hawthorne 2-16-01

Dear Mr. Hawthorne:

I enclose all of your samples, I think, that you sent to me, along with the results of an X-ray diffraction study of two of the samples, which cane out with identical results. The samples are a combination of analcime and calcite, I am afraid that these secondary minerals have completely replaced the original mineralogy of the samples, so there is just no telling what they originally were. The gross petrography does resembles devitrified glass, but this could have been a volcanic glass. I am afraid that I can do no more with the samples, because they have been so altered from the original mineralogy.

I suggest you consult Chris Koeberl, who might be able to tell you more. He is at Christian.koeberl@univie.ac.at

Sorry I could not be of mire help.

Mike Zolensky

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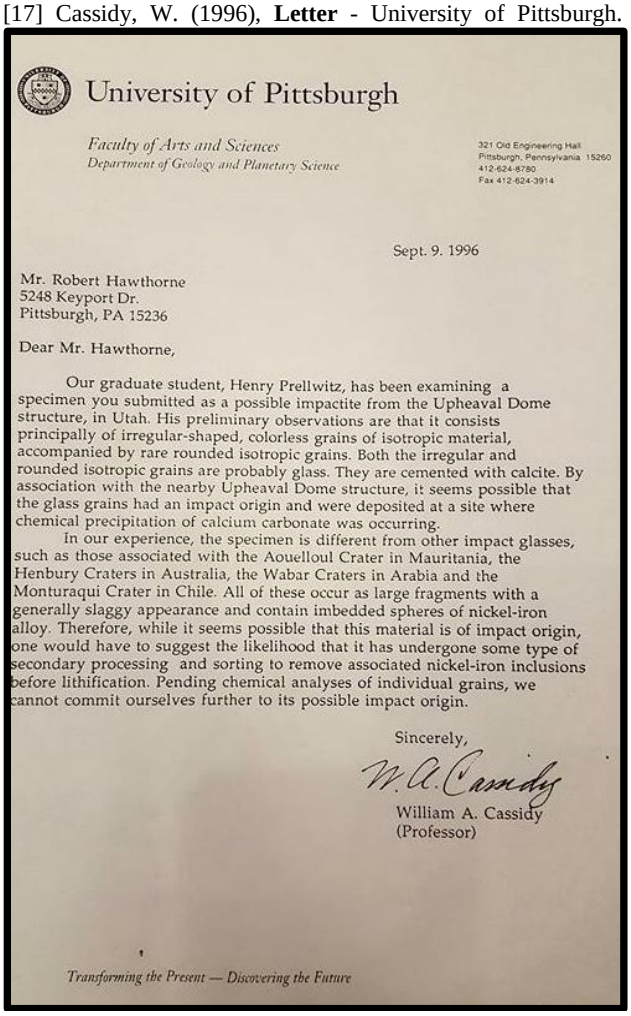

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Sept. 9. 1996

Mr. Robert Hawthorne
5248 Keyport Dr.
Pittsburgh, PA 15236

Dear Mr. Hawthorne,

Our graduate student, Henry Prellwitz, has been examining a specimen you submitted as a possible impactite from the Upheaval Dome structure, in Utah. His preliminary observations are that it consists principally of irregular-shaped, colorless grains of isotropic material, accompanied by rare rounded isotropic grains. Both the irregular and rounded isotropic grains are probably glass. They are cemented with calcite. By association with the nearby Upheaval Dome structure, it seems possible that the glass grains had an impact origin and were deposited at a site where chemical precipitation of calcium carbonate was occurring.

In our experience, the specimen is different from other impact glasses, such as those associated with the Aouelloul Crater in Mauritania, the Henbury Craters in Australia, the Wabar Craters in Arabia and the Monturaqui Crater in Chile. All of these occur as large fragments with a generally slaggy appearance and contain imbedded spheres of nickel-iron alloy. Therefore, while it seems possible that this material is of impact origin, one would have to suggest the likelihood that it has undergone some type of secondary processing and sorting to remove associated nickel-iron inclusions before lithification. Pending chemical analyses of individual grains, we cannot commit ourselves further to its possible impact origin.

Sincerely,

W. A. Cassidy

William A. Cassidy
(Professor)

Transforming the Present — Discovering the Future

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