Evidence of Microscopic Ball Lightning in Cold Fusion Experiments

E. H. LEWIS

P. O. Box 2013, Champaign, IL 61825
www.scientificrevolutions.com
E-mail: elewis@intenex.net

There is evidence of microscopic ball lightning in several methods of cold fusion and transmutation. Thus far the experiments of Matsumoto, Miley, Shoulders, Savvatimova, and Urutskoev et. al have shown evidence of these objects that range in size from sub-atomic to about 1 milimeter in diameter. This article presents pictures and evidence collected by these groups, summarizes the evidence found by other groups, and discusses the significance of microscopic ball lightnings. The implications for atomic physics and physics in general are discussed.

1 Introduction

During the last 13 years, the evidence for microscopic ball lightning in CF experiments has been building. Little objects that behave like natural ball lightning in many ways leave characteristic markings. Such markings have been found in Matsumoto's experiments since about 1991, Miley's experiments about 1996, Shoulders experiments about 1996, Savvatimova's experiments about 2000 and Urutskoev's experiments about 2001. I am not sure on the exact dates these markings were found. The markings are characteristically about 1 micrometer to 1 millimeter in diameter, and are usually either spots or long trail-like markings as though the ball lightning moved along the surface of something. Sometimes they are groves or bore holes. Similar markings produced by plasmoids and EVs have been studied for decades, sometimes for fusion research, and through his experimental observations, Shoulders showed that the plasmoids studied by Bostick, Nardi, and other researchers are composed or EVs or are EVs. The significance of these objects for the field of cold fusion and transmutation in general is that these are a cause of transmutation and cold fusion reactions, but on a deeper level they point to out the plasmodal identity of atoms. In this article, the very similar markings found by these groups who did somewhat dissimilar experiments independently are discussed, compared and contrasted, and the general meaning of these objects to physics is discussed.

Such markings are seen clearest in Matsumoto's Acrylite plastic sheets and in the clean targets used by Ken Shoulders. It seems that the X-ray films used by Savvatimova and the CR-39 sheets used by Urutskoev don't yield as clear markings. The trails may sometimes be millimeters long. In his early articles on cold fusion and transmutation, as part of the regular method of research on nuclear reactions, Matsumoto set up Acrylite plastic sheets coated with an emulsion that allowed him to capture the tracks of reaction products. He found strange and large markings and began to explain them by a theory called the Nattoh model, which is a type of Japanese rice pudding. However, he focused his experimental research on these objects creating the strange traces, especially after he learned about the idea of microscopic ball lightning, and published about 6 articles in *Fusion Technology* from 1991 to 1995 about photographs of these markings and their meaning. However, he was generally ignored and ridiculed, even by cold fusion researchers, and felt that he couldn't even get a hearing at cold fusion conferences. In 1993, he accepted the idea of microscopic ball lightning and started research on this idea specifically, but didn't get his ball lighting articles published. In 1996, after an earthquake in Hokkaido where he lives, he noticed that microscopic tracks were left on plastic sheets and perhaps discovered naturally produced microscopic ball lightning. Here are two pictures of his tracks from his experiments.

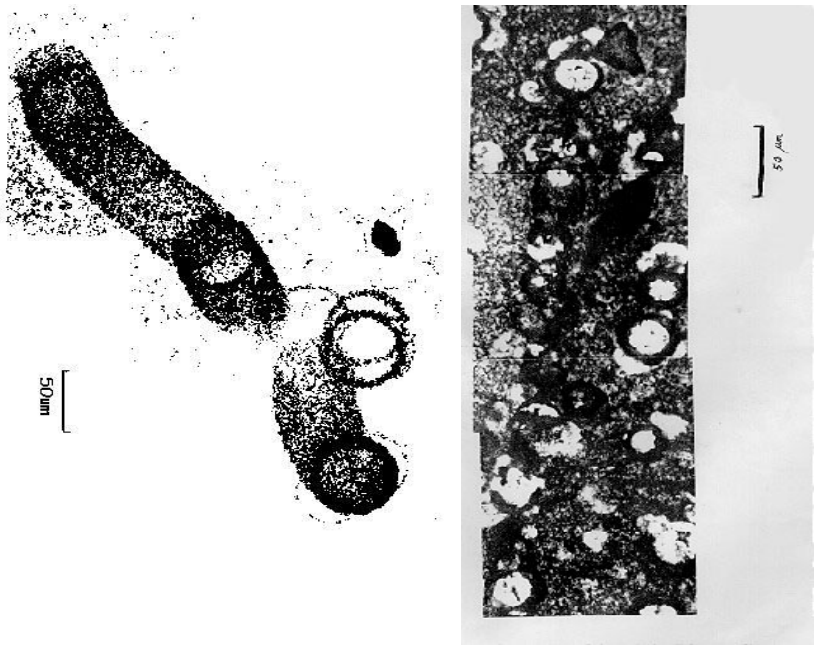
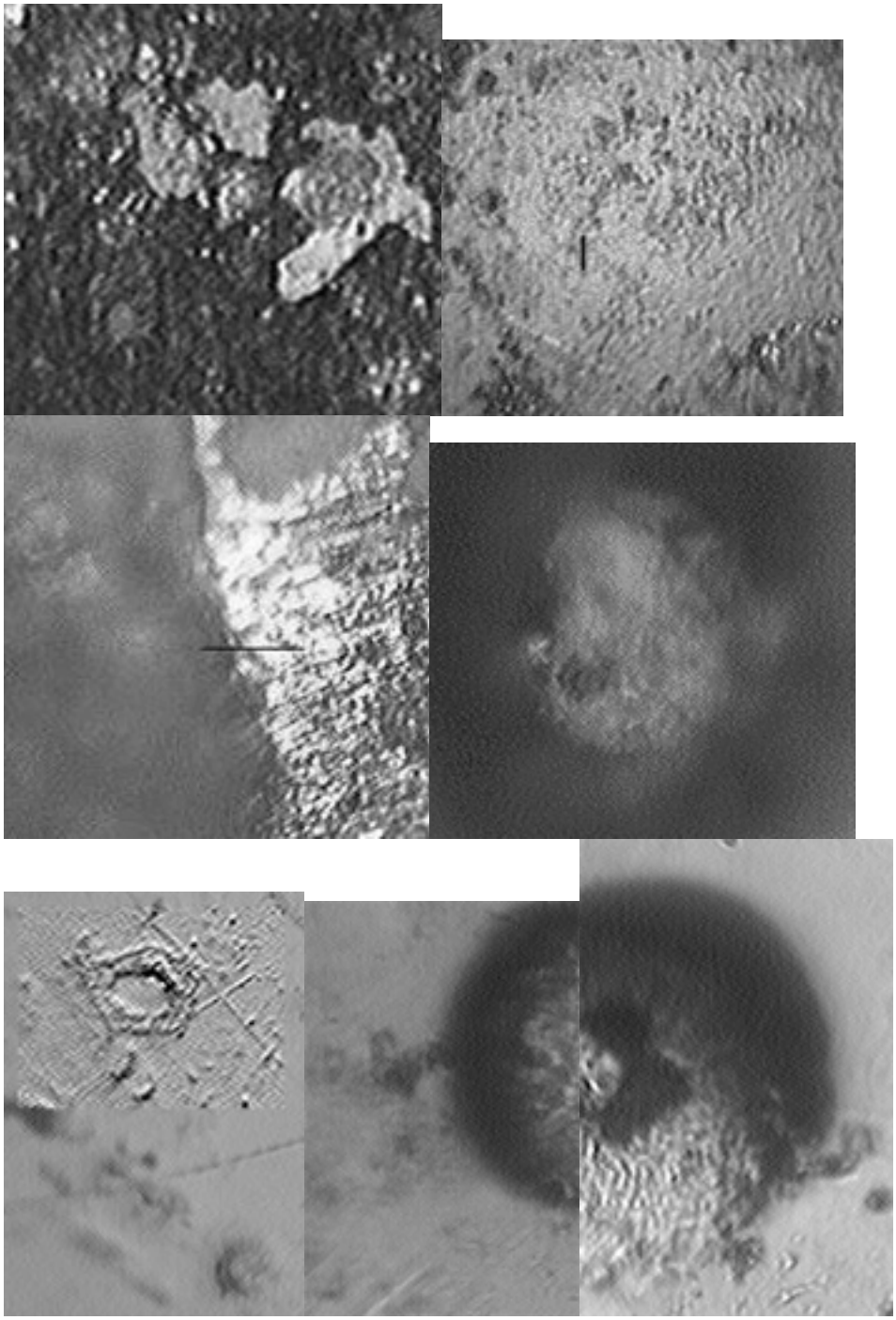


Figure 1[1]. **Ring and Track Markings Left on a Sheet of Acrylite Plastic.** It is evident that at least one toroidal object about 50 micrometers wide slid and jumped around. If there were one than one such object, it was remarkably similar in size. Acrylite sheets were outside of a discharge container filled with water. The sheets of plastic were about 100 micrometers wide by 50mm by 50mm, and this sheet was one of a set of such sheets set in parallel with about a 3mm gap in between each sheet. These emulsions were set outside a cylindrical glass cell which had an Acrylite bottom 1 mm thick. They were set outside this plastic bottom. This suggests that the plasmoid phenomena traveled through the Acrylite or the glass. One of the anomalous abilities of ball lightning is the ability to travel through glass and other insulators. This evidence points to the identity of these objects as microscopic ball lightning. It is possible that the object responsible for these markings on one side of one sheet of plastic also left similar markings close in size on the backside of the preceeding sheet. Tornadoes hop in a similar manner. The object was 50 micrometers wide. Figure 2[2]. **Ring and Pit Markings Left on an Electrode after Discharge.** These markings are very similar to the markings shown previously by Nardi and Bostick of plasmoids. The markings are less than 50 micrometers wide. Matsumoto preformed electric discharging in ordinary and heavy water. The anode was a platinum pin and the cathode was a copper plate.

In 1996, a researcher working in Miley's lab investigated the microsphere experiments. In these experiments, little beads coated with thin layers of nickel or other elements about 650 angstroms thick via a special, patented electrode sputtering technique. These pictures are from Nickel on plastic Run #8 This cell and the anomalous appearance of a wide range of novel elements has been described by Prof. George Miley in several articles[34]. In Miley's ICCF10 lecture, he said that it was this Run #8 exhibited by far the most excess heat than the many others he studied. The electrolysis was performed in his laboratory at the U of I. The pictures were taken by using a digital camera that was attached to a good optical microscope.



These seven photographs are at a magnification of 200x or 400x and are of markings on the two Lexan casings, two microspheres, and the Ti anode and cathode of Run #8. Figures 3 and 4 are of the post-run microspheres. **3)** shows 2 ring marks in the metal. The marks looks like two rings of ball lightnings, like beads in a necklace, left little pits in the metal. These are much like most of Shoulder's ring markings. **4)** shows 1 faint ring mark in the plastic bead where the metal had flaked off. Figures 5and 6 are photographs of the titanium plate cathode and the titanium plate anode of the cell. These plates enclosed the microspheres in a Lexan plastic casing.
5) shows a very faint mark pointed out by the black line. It is about 18 micrometers wide, and is clearer in the original photographs. **6)** shows a round ring mark in a pit that formed in the anode. The pits were interesting and deep. The pit itself is about 200 micrometers wide at the surface of the anode, but narrowed down to the white area that is about 100 micrometers in diameter. The ring mark is about 20 or 30 micrometers wide. Grooves and strings of little dots are visible as well. Ball lightning-like plasmoids often form little

strings and rings. Tornadoes and ball lightning also form such lines or circles. See for example this link: http://www.ernmphotography.com/Pages/Ball_Lightning/OtherBLPages/fbparks/BL_Triple_Waterspout.html Figures 7, 8, and 9 show ring marks on the casings. Two different casings were used for this run. **7)** Ring mark in the plastic casing, in a photograph that was computer processed to make the edges more apparent. **8)** Lexan Plastic Casing #2 of Ni/Plastic Run #8. Magnification 200x. Shows a group of small rings. The markings are seen from the outside of an intact casing. The picture shows the convex impression left by a microsphere that was in contact with the inside of the casing. The bead developed both ridges and ditch markings. To the left of the bead impression are the faint marks of rings that are about 20 micrometers wide. **9)** Lexan Plastic Casing #2 of Ni/Plastic Run #8. Magnification x200. Shows a ring mark to the right of the bead impression. The picture shows the convex impression left by a microsphere that was in contact with the inside of the casing. The bead developed both ridges and ditch markings. A BL may have left a trail mark in the plastic or bored through. The ring mark is about 25 micrometers in diameter. Details about the experiment and the markings are discussed in other articles. The photographs shown here were taken by E. Lewis of various components of Ni-Plastic Run #8 in the Laboratory of Professor G. H. Miley at the University of Illinois at Urbana-Champaign in 1996. His cooperation in allowing this work is gratefully acknowledged.

The photographs in the next figure were taken by Savvatimova[5] of markings that were both inside and outside her discharge device. She used x-ray film.

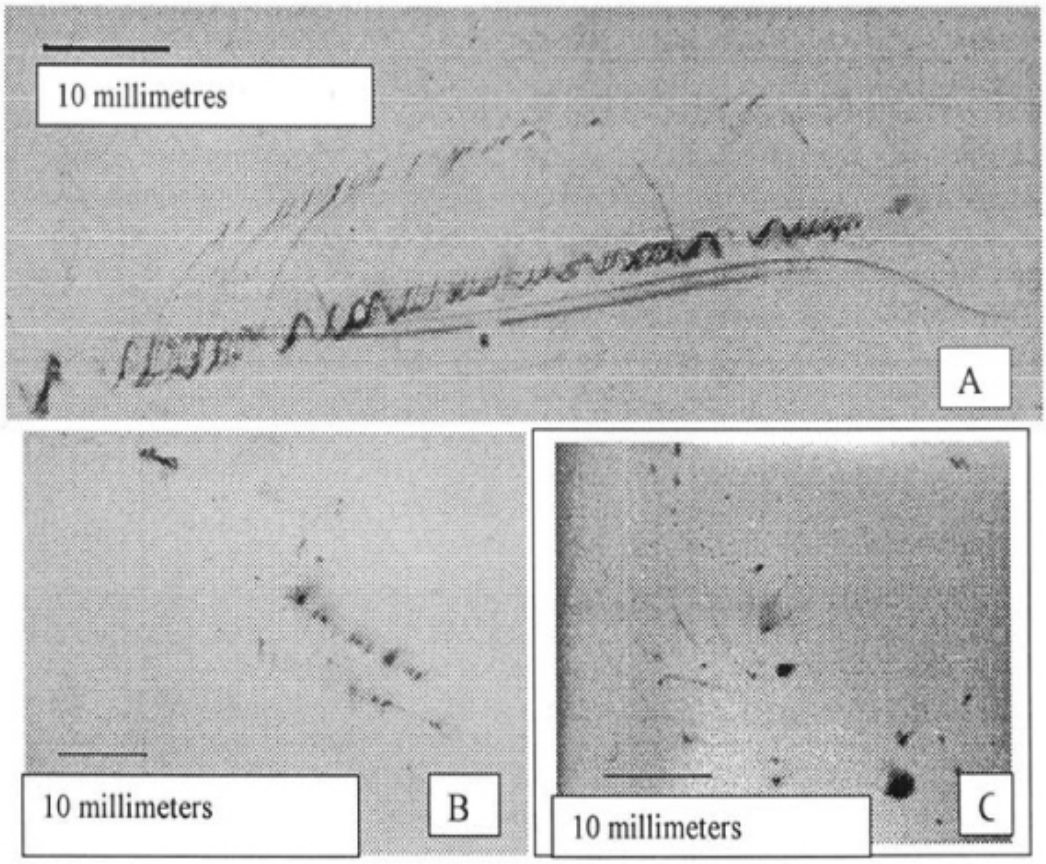


Figure 10. X-ray Film Outside (A, B) and Inside the Vacuum Chamber after Deuteron Irradiation in Glow Discharge.

The objects in Shoulders' experiments that he calls EVs behave in ways similar to BL. They are a type of BL. Their special characteristics such as very fast travel may be due to the method of their production with the type of electrodes he uses. His method of getting the tracks shown here produces clear markings of the ball lightnings and their effects. He uses flat, clean materials, and sometimes coats his "witness plates" as they are called in this field with temperature sensitive material like wax in order to see how warm these objects are. Like many ball lightnings, the objects that left the markings in Figure 12 might not have been warm at all, because in other similar tests with aluminum oxide coated with wax, here was apparently no melting of the wax at all, although it is obvious the underlying material, aluminum oxide[6], moved as if there was a splash. Similar effects are seen around ball lightning and in lightning strikes sometimes, and in other electrical discharges experiments, and also happen during transmutation. What all this points to is a state of matter that needs to be understood. In this plasmoid state, the atoms act like ball

lightning. In the next photograph, Figure 13, a chemical analysis was performed at the site of this type of atomic sloshing (motion), and a wide range of chemical elements are discerned, as is shown in Figure 14.

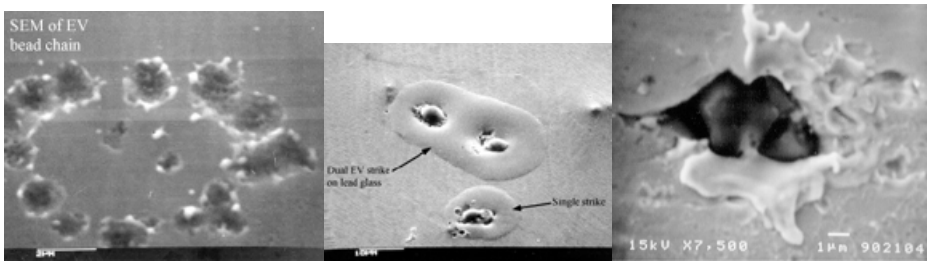


Figure 11 from Ref. 6. Ring Mark in Witness Plate. This is a typical type of ring marking. Figure 12 from Ref 6. Strike Marks on Lead Glass. These marks show the heatless motion of atoms. Both figures 11 and 12 are from the same article. Shoulders reports that there is no evidence of heat. This figure shows the effects of several ball lightnings hitting this lead glass surface. Figure 13 from Ref. 6. Impact Site on palladium foil loaded with deuterium Shoulders reports that chemical analysis of this spot showed many transmuted elements.

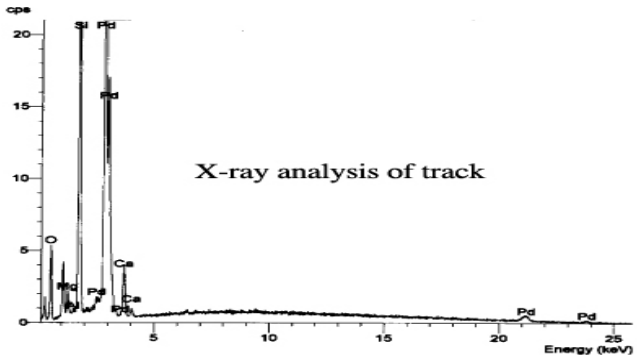
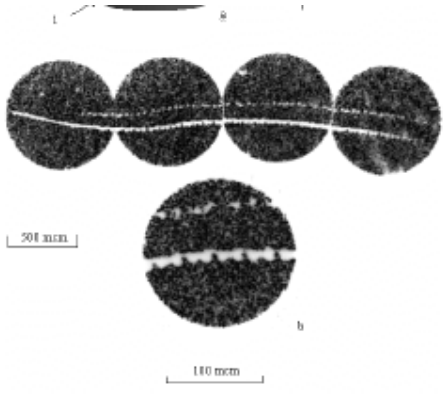


Figure 14 from Ref. 6. Impact Site X-ray analysis of the ball lightning strike shown in Fig. 13. Shoulders reports that chemical analysis of this spot showed many transmuted elements.

Recently, Urutskoev has published pictures similar to these. In picture 15 of his article published in 2002, "Observation of Transformation of Chemical Elements during Electric Discharge[7]," the marking looks much like the bottom two wispy lines in Savvatimova's picture in Fig. 10a. They look like some of the long trail tracks in Matsumoto's article as well.



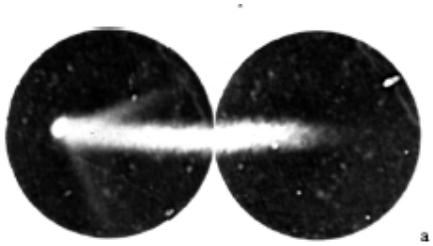


Figure 15. Trails like those shown by Matsumoto and Savvatimova. Figure 16. A comet like trail. They wrote that markings like these had a very high energy. These may be like the type of BL markings that Matsumoto called "white holes." The white marking is about 1000 mcm long, and remind me of some of Shoulders pictures of fast moving EVs. The authors attribute a nuclear-reaction origin to the object.

These pictures show similar markings. Rings or trails or combinations of rings and trails or blotches or pits. This is because the microscopic ball lightning objects may move on surfaces, as does ball lightning in nature. Or they may impact surfaces, leaving the pits. Sometimes as in nature, they leave deposits. Sometimes tornadoes and ball lightning leave groves in the ground or in materials. In their article from 2002, Urutskoev mentioned finding markings like scratches. Dash has also written about and shown a picture of a scratch-like mark in an electrode. And Shoulders has shown pictures of such groves. In nature, ball lightning sometimes bore tunnels in walls, and Egely[8] has published descriptions of these.

The existence of these objects presents cold fusion researchers and physicists in general both a cause and an effect of atomic reactions. They are a newly discovered type of particle. At a deeper level, they call into question the assumptions of nuclear physics and the Q.M. paradigm atomic model. These objects are anomalous to Q.M. theory in that this type of matter is energy. It points to the idea that atoms are structured like them. Research is needed to determine the effect of these ball lightning objects on time, gravity, magnetism, electricity, and atomic reactions. We need accurate determinations of the physical relationships in order for theory to develop further.

In conclusion, thus far 5 groups working on three continents and half a hemisphere have published the markings of tracks like that of microscopic ball lightning that were associated with successful transmutation and cold fusion experiments that exhibited unusually high transmutation and excess energy. In fact, Savvatimova especially emphasized that there was a correlation between the amount of transmutation in a reaction run and the number of markings produced, and I think that Miley's, Matsumoto's, Shoulders and Urutskoev's experiments also bear witness to such a correlation. I would like to thank all these researchers for their permission to reproduce these photographs. I think that people working in other continents and the other hemisphere will find such products and similar correlations. Some experiments may not produce these larger types of BL objects. But in all experiments anomalous to Q.M, the atoms themselves transform to a state like ball lightning.

References

[1] T. Matsumoto, "Observation of Tiny Ball Lightning During Electrical Discharge in Water," manuscript article, 1994.

[2] T. Matsumoto, "Experiments of One-Point Cold Fusion," manuscript article.

[3] G. H. Miley and James A. Patterson, "Nuclear Transmutations in Thin-Film Nickel Coatings Undergoing Electrolysis," **2nd International Conference on Low Energy Nuclear Reactions, College Station, Texas (September 13-14, 1996)**.

[4] G. H. Miley et al., "Quantitative Observation of Transmutation Products Occurring in Thin-Film Coated Microspheres During Electrolysis," **Proceedings of the ICCF-6, Hokkaido, Japan, (October 14-17)**.

[5] I. Savvatimova, "Reproducibility of Experiments in Glow Discharge and Processes Accompanying Deuterium Ions Bombardment," **ICCF-8, Lerici, Italy, (May 21-26, 2000)**.
[6] K. Shoulders, "Charged Clusters in Action," manuscript article, 1999.
[7] L.I. Urutskoev, V.I. Liksonov, and V.G. Tsinoev, "Observation of Transformation of Chemical Elements During Electric Discharge," *Annales Fondation Louis de Broglie*, **27**, no. 4 701 (2002).
[8] G. Egely, *Hungarian Ball Lighting Observations*, Center Research Institute of Physics, Hungarian Academy of Sciences, 1987.