**Frontier Analysis, Ltd.**

**TECHNICAL SERVICE RESPONSE NO.: UT009**

**Subject:** Identification of a White Material Purportedly Related to a Rotating Ball of Light in Hoeven, Holland (August 2, 1997)

**Date:** January 8, 2001

**Requested By:** Nancy Talbott
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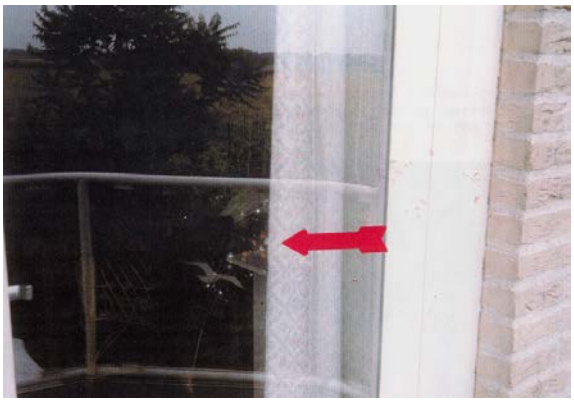
**Background/Objective:** A large (10 – 12' diameter) very bright, rotating ball of light was observed at about 10 p.m. on August 2, 1997 by Robbert (age 16) and sister Madelon (age 10). It was immediately outside the balcony windows off a bedroom of their home in Hoeven, The Netherlands. They observed the light from this bedroom. A white powder was found lying on the floor outside the balcony doors and adhering to the glass door after the ball of light was seen. Following are photographs of the material as found[1].

[1] Photographs courtesy of BLT Research and taken by Rudi Klijnstra.



## Conclusions:

The white material is identified as basic magnesium carbonate with the following approximate chemical structure: $(MgCO_3)_4 \bullet Mg(OH)_2 \bullet 5H_2O$. A very small amount of calcium carbonate may also be present. It is unknown why this material appeared after the UFO event. Known uses for basic magnesium carbonate follow[2]: magnesium salts; fireproofing; heat insulation and refractory; rubber reinforcing agent; inks; glass; pharmaceuticals, dentifrices and cosmetics; free-running table salts; antacid; making magnesium citrate; filtering medium. It's used in foods as a drying agent, color retention agent, anticaking agent carrier.

## Procedure:

Sample: KS-04-32 A white powder wrapped in paper.

An infrared spectrum was obtained of the sample using the Harrick SplitPea® cell on the Nicolet Avatar 360 spectrometer. Microscope photographs were obtained using the Leika

[2] G. Hawley, "The Condensed Chemical Dictionary", Tenth Edition, Van Nostrand Reinhold Company Inc., New York (1981); "The Merck Index", Tenth Edition, Published by Merck & Co., Inc, (1983)

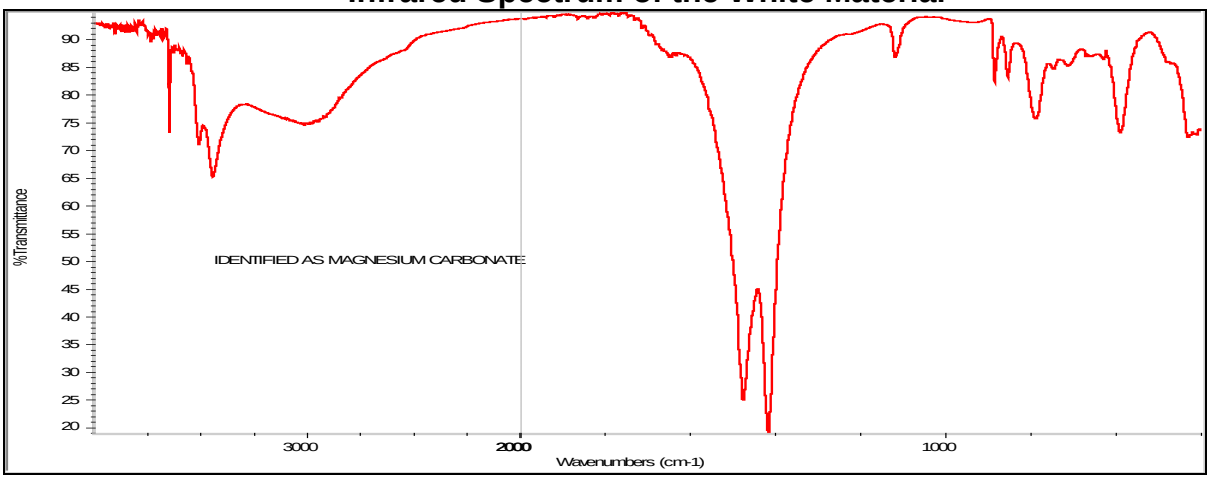
GZ6 stereomicroscope interfaced to a Kodak Digital Science MDS 120 camera. EDX data were obtained from another laboratory by BLT Research. It is included in this report.

## Results:

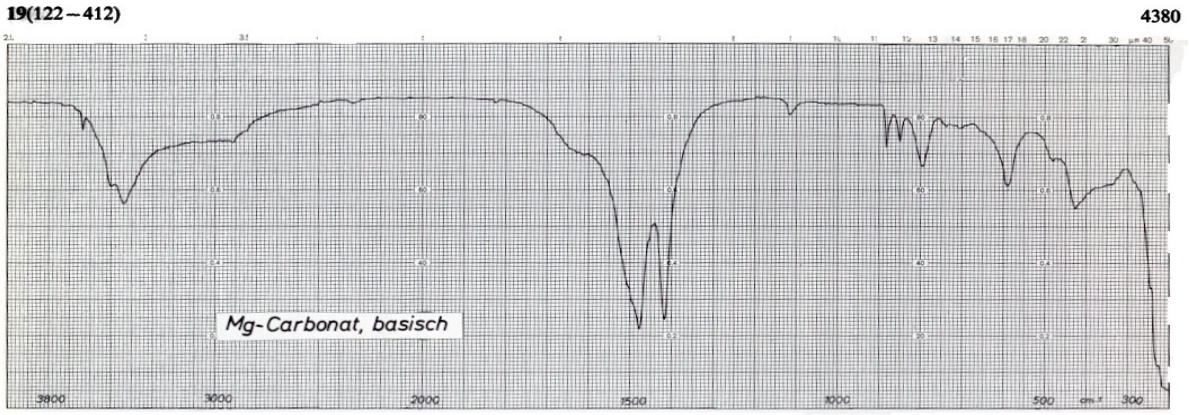
The results of the individual tests done on the sample follows. These results are summarized in the conclusions section on the first page of this report.

The infrared spectrum of the material clearly identifies the white powder as magnesium carbonate which specifically appears to be in a basic form. The chemical structure is approximately $(MgCO_3)_4 \bullet Mg(OH)_2 \bullet 5H_2O$. The spectrum matches references of this material[3]. Following is the spectrum of the material and a commercial reference of basic magnesium carbonate for comparison.

**Infrared Spectrum of the White Material**




**Infrared Reference Spectrum of Magnesium Carbonate**

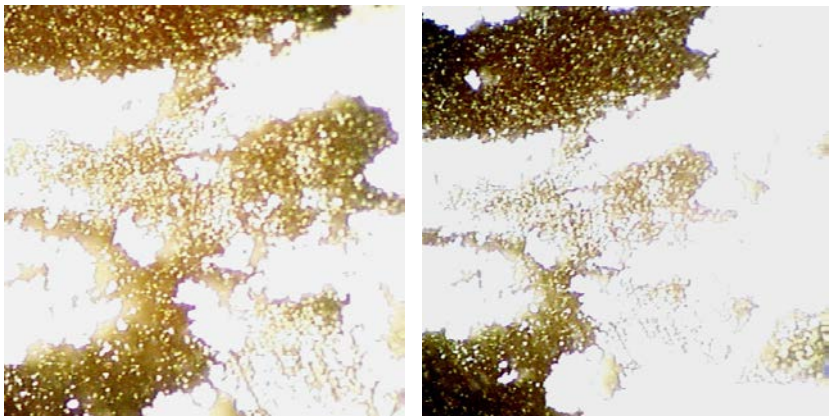



(1) Magnesiumcarbonat, Magnesia alba
(2) Sammlung Ingrid Schnell, BASF Farben + Fasern AG, Münster
(3) x $MgCO_3 \cdot Mg(OH)_2 \cdot x\ H_2O$; x = 3…5
(4) weißes, in Wasser schwer lösliches Pulver
(5) Füllmittel für Farben, Papier, Kautschuk
(6) KBr
(7) PE 283; Absorption jenseits 300 $cm^{-1}$: KBr

(1) Magnesium carbonate, magnesia alba
(4) white powder, scarcely soluble in water
(5) filler for inks, paper, rubber
(6) KBr
(7) PE 283; absorption beyond 300 $cm^{-1}$: KBr

[3] Prof. Dr. Dieter O. Hummel, Atlas of Polymer and Plastics Analysis, "Inorganics Section", Verlag Chemie GmbH, Df-6940 Weinheim, 1984, Part a/II, Ref. 4380.

Microscope photos of the white material follow. These are taken at approximately 60x magnification. They reveal a very fine white powdery substance, which fits the description of this material in the literature[4], i.e. a white, odorless, bulky powder."



EDX data detects predominant amounts of magnesium and oxygen, some carbon and trace amount of calcium. This supports the infrared identification of basic magnesium carbonate. The low level of calcium probably suggests a very small amount of calcium carbonate is also present.

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Distribution:

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[4] Ref. 2