

## **Meteoritic Material in a Minnesota Crop Formation 1994-1995**

Laboratory Code: KS-02-104

Material: mature corn ears (*See maps*)

Formation: 47 ft. dia. circle in a corn field near Blaine, MN -  
found in Oct. 1994 by a pilot flying over area.

Sampled: Mr. R. Schultz, 2119 Violet Lane, New Brighton, MN 55112.  
1) corn samples taken Oct. 28-30, 1994  
2) magnetic drags Nov. 2, 1994, with a repeat of the same areas on  
Aug. 22, 1995 (under the direction of Mr. Schultz)

### DETAILS RELATED TO CROP FORMATION SITE

In addition to the above samples of plant material, there were some unusual materials collected from this crop formation site. Although the analyses of our findings are not complete, it was felt that those genuinely interested in learning of our research efforts should be informed of this event. We have not reported heretofore since there is an apparent association with meteoritic material having the same characteristics as discussed in our published paper, "Semi-Molten Meteoritic Iron Associated with a Crop Formation", J. Scientific Exploration, 9, pp. 191-199, 1995. Early release of this information would probably guarantee that the "UK vandals" would claim to have spread iron filings over the entire state of Minnesota and, as ridiculous as it may sound, insist they produced this very complex and intriguing crop formation.

The land owners and Bob Schultz were very cooperative and furnished detailed information plant materials, as well as specimens of unusual materials deposited near the epicenter of the circle formation. One type of deposit consisted of "white granules" spread over the ground and on plants. Mixed in with the white substance and soil particles were what was described as "yellow crystals". And just to make things more interesting the white granules and yellow crystals were in proximity with a triangular pattern of holes in the soil. The description and spatial arrangements of these materials can be more readily appreciated by referring to Bob Schultz's diagram in Fig. 1, attached. [The solid, horizontal lines in Fig. 1 represent corn rows remaining after harvest. This section was intentionally left unharvested so that Bob Schultz could conduct a thorough study of this area.]

During the 1994 investigation Bob located a very high-field-strength magnet (out of a klystron tube) and performed thorough field drags in and around the crop formation. These drags, conducted after the Perseid meteor showers in August, 1994, produced a plethora of magnetic particles which, as will be shown in the following sections, had characteristics very similar to the meteoritic material found in the 1993, UK formation. After the 1994 samples were collected, the remainder of the field was then

harvested and plowed in the spring of 1995. This means that magnetic particles on the soil surface in 1994, were now 6" to 8" underground.

Corn was again planted in this field in 1995 and, although no crop formation occurred, a magnetic drag was conducted in late August 1995 after the Perseid meteor showers. The rationale for this 1995 magnetic survey being, if this area is particularly conducive to ion plasma formation, one might find an association with the atmospheric materials even though the level of the vortex energy was not sufficient or organized sufficiently at ground level to produce a crop formation in the very tough corn plants.

Again in 1995 the magnetic drags collected several grams of material at each sample area. At the specific location of the 1994 epicenter, the 1995 magnetic material was observed to possess the characteristics of the magnetic-glaze material discussed in our paper (previous reference). As in the UK event the Minnesota sampling indicates a kinetic interactive process taking place between the vortex energies and meteoritic particles. Since the discovery of the magnetic-glaze material in 1993, over 30 crop formations have been subjected to a magnetic drag and this Minnesota site is the only formation to yield any significant magnetic material to-date.

SEED GERMINATION RESULTS- The diagram in Fig. 2 shows the corn ear sampling locations in the 1994 formation. Inserted on this diagram are the summarized growth data from the 7-day seedling development in tests conducted with our normal growth chamber method. These data are expressed as a percent change relative to the average growth in the two controls (samples #5 and #6). From a statistical analysis of these growth data the #4 sample, taken near the edge of the formation, gave significantly higher growth than the controls. This growth stimulation effect has been observed in seeds taken from other crop formations in corn and other species of plants. Details of this effect as well as a suggested explanation are presented in "Anatomical anomalies in crop formation plants.", *Physiol. Plant.* 92: pp. 356-363, 1994. It is apparent from these growth data that the plants were subjected to organized, transient energies with characteristics similar to those occurring in formations previously sampled in other regions of the USA, Canada and England.

WHITE GRANULES- In addition to finding the white substance on small plants and on the soil, it was also observed to be located between the kernel rows underneath the outer husks. It was very sparsely distributed in the sample #2 kernels and, to a heavier extent, on the sample #4 kernels (both samples from within the formation). It should be noted that the seeds used in the germination tests did not have any of the white material on them. Microscopic examination revealed that the white material was not typical of a mold or fungal growth.

While examining at around 100X magnification, water was added under the cover glass. Very rapid dissolution took place with pronounced bubble formation (probably trapped air between the

grains). The slide was re-examined several hours later after the water had begun to evaporate from under the cover glass. Very fine needles of re-growth crystals appeared to be nucleated at a thick, basal growth point. In some cases the thick base grew and produced a wide twisted ribbon appearance. Occasionally one of the needle crystals was observed to have a remarkably uniform helix or corkscrew type of growth pattern. After many unsuccessful attempts to show the details of these crystals the photomicrograph in Fig. 3A was obtained. Note the "uncoiling" effect at the end of the growing crystal, while at the more basal regions the spiral turns were more uniform with very tight, closely-spaced pitch angles.

These spiral growth patterns were also observed at a more macroscopic level (as shown in Fig. 3B) where the large spiral granules are located on the surface of a small plant (possibly a clover leaf). If examined closely one can observe the spiral effect in all of the fragments on the leaf. From the energy dispersive spectral analysis (EDS) in Fig. 4 we can immediately rule out an organic substance since there is no carbon peak. From those elements present, and knowing the high solubility of the grains, we are left with the possibility that this substance is a form of "water glass" - a soluble sodium silicate compound containing sulfur and calcium "impurities" or additives. Over 40 years ago one of us (WCL) worked with water glass type compounds, and as recalled, when crystallized from a saturated aqueous phase very unusual growth patterns are obtained. The tight spiral growth form appears to be a unique feature of this particular composition and indicates the presence of a screw dislocation mechanism operating during the crystal growth phase. About the only present-day use of water glass is as a binder in the manufacture of grinding wheels. The question remains as to why it is present at the epicenter of a crop formation in a corn field?

AMBER "CRYSTALS"- Under a cursory examination the large, clear amber-colored particles associated with the white granules do indeed appear to be a glass or crystalline substance; however, their very soft, brittle properties rule out glass and most inorganic crystals. The EDS curves in Fig. 5 show a very pronounced carbon peak which suggests an organic compound. From these physical properties and appearance, this material is very suggestive of an organic resin such as amber (an aromatic terpene). The minor amounts of sodium and silicon are probably impurities. Sulfur may also be an impurity and quite probably accounts for the amber color. Again it seems very unusual that we have two unique compounds, one inorganic and the other organic, both mixed together near the epicenter of the 1994 formation.

1994 MAGNET DRAGS- The klystron magnet was placed inside a plastic bag and literally dragged over the soil surface using about 12 passes per sample area. The locations are marked [10] and [11] on the Fig. 2 sampling diagram. In sample [10] taken near the epicenter the magnetic particles were very similar to meteoritic magnetite ( $Fe_3O_4$ ); however, in contrast with the UK magnetic-glaze samples, there was very little evidence of the more oxidized,

red-colored hematite ( $\text{Fe}_2\text{O}_3$ ). The EDS curves in Fig. 6 were obtained from spherules in sample [10] and confirm that the particles are indeed pure iron oxide, highly suggestive of a meteoritic origin (see magnetic glaze paper).

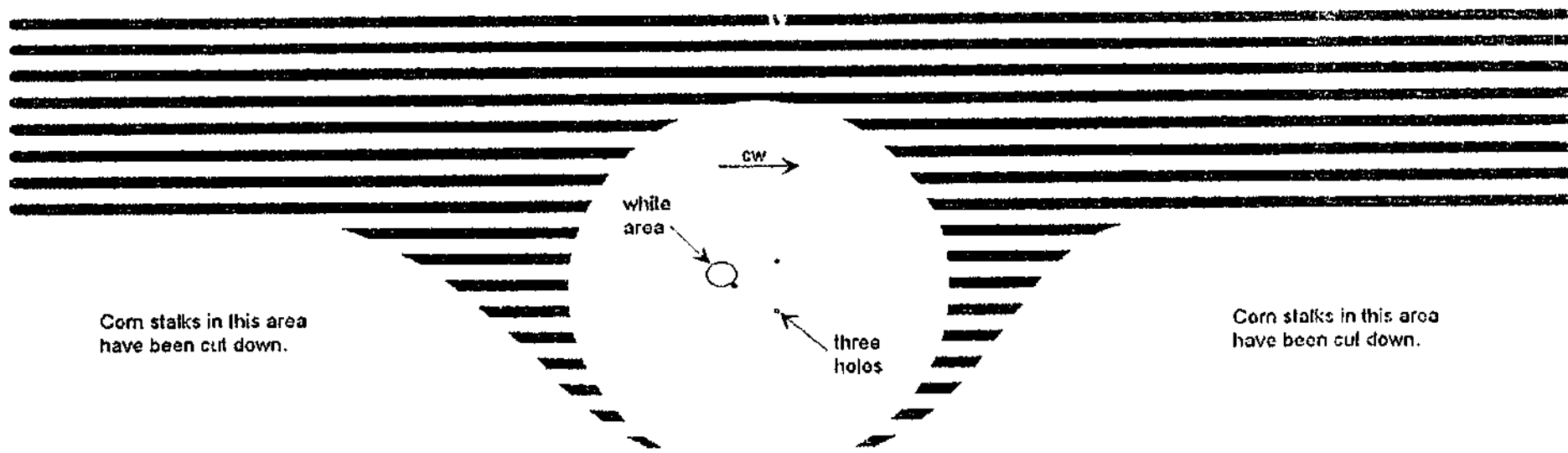
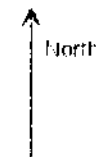
The EDS curves from sample [11] were essentially the same as shown in Fig. 6 and again there was a notable absence of the red oxide form (hematite). The most notable difference between the epicenter material [10] and sample [11] collected outside was the shape of the iron particles. The epicenter sample contained a high concentration of magnetite spheres and tear-drop shaped particles which in some cases were clumped together. The sample taken 40 ft. west of the formation contained particles of a more irregular shape and there was no apparent clumping of particles; furthermore a significant fraction of the particles had a tetrahedral shape, characteristic of magnetite crystal growth. These differences suggest that the sample [10] particles were subjected to a higher temperature during their flight through the atmosphere, as compared to the sample [11] particles from outside the formation. This postulate of differing thermal regimes is compatible with the reheating model as put forth in our magnetic glaze paper.

1995 Magnet Drags- Although no crop formation was apparent in the corn field, magnet drags were conducted in the same regions as those in 1994. Although the magnetite particles were again found, a difference was observed in the ratios of the iron oxides. In the epicenter sample the presence of hematite was far more apparent in the 1995 sample. One large chunk of the mixed oxides (2-3 cm dia.) was found to have magnetite spherules clinging to corners or sharp points on the surface and, as shown in Fig. 7A, formed pillars as a result of their mutual magnetic induction. This effect was not seen in the 1994 samples.

When this large chunk of commingled oxides was broken open with the fingers, the force necessary was similar to what might be expected in a "sintered" material. Inside was a large cavity which appeared to be lined with a reddish glaze of hematite. In Fig. 7B the arrow points to a glazed dome and although it is difficult to observe in this photomicrograph the dome contained very minute cracks identical in appearance with those shown in Fig. 3A in our magnetic glaze paper. The implication here is that the mechanisms causing an involvement of the meteoritic iron with the crop formation vortex were very similar in form and energy content to the energetics within the Cherhill, UK, formation. As a reminder - the UK formation occurred in wheat, whereas the MN samples were in corn, a crop that would take considerably more energy input to produce a plant lay pattern. Hindsight tells us that it was unfortunate that corn plant samples were not taken at the 1995 magnet drag sites.

Fig.1 Minnesota crop formation in corn, 1994 (KS-02-104)

Corn stalks near circle center are flat against the ground and lie radially out from center.  
Corn stalks near circle edge are 20 to 30 degrees above ground and lie clockwise with tops both within as well as outside of circle.  
Velvet leaf cockle burr weed stalks in the circle have been bent over and then righted themselves. They have a scrape mark several inches long on the side of the stalk.  
White granules were found mixed with dirt near the circle center. These granules were only in the top 1/8 inch of soil. One small weed had a leaf that had been covered with the white material. Three yellow crystals were found perhaps 1/2 inch beneath the white layer.  
The largest crystal is shaped like a pebble that is 3/4 inch wide. The smallest is 3/16 inch.  
Three holes were found about 6 inches wide and 6 inches deep. They were spaced 74 inches.  
Other holes similar to these were found outside the circle.



Corn stalks in this area have been cut down.

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The diameter of the circle is 47.0 +/- 0.5ft.

The distance between rows is 38 +/- 2 inches.

CROP CIRCLE  
Blaine, MN 10/24/94  
  
Drawn by R. Schultz  
Revision 11/3/94  
Scale: 1in=20ft

Fig.2 Sampling diagram in 1994 crop formation KS-02-104, showing seed development relative to controls (mean of samp. #5 and #6)

Location of samples: ①,②,③ etc.

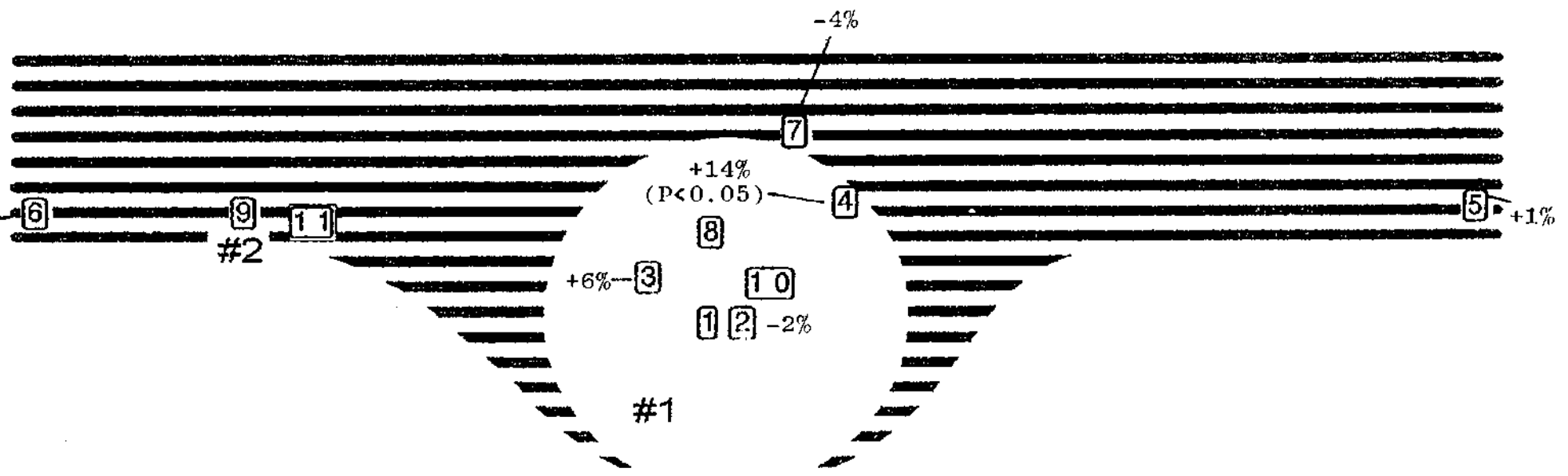
Samples ⑤, ⑥ and ⑦ taken from standing corn stalks.

Samples ⑤ and ⑥ taken 100ft from edge of circle.

Sample ⑨ taken 40ft from edge of circle.

Weed #1 has a scrape mark.

Weed #2 is control taken 40ft from edge of circle.



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Blaino, MN 10/24/94

Drawn by R. Schultz  
Revision 11/3/94  
Scale: 1in=20ft

Samples taken 10/28, 10/30 and 11/2/94.

Fig.3 White granules found in 1994, Minnesota crop formation (KS-02-104),  
Mixed with soil and on plants at epicenter of formation.



A. Re-crystallized needle  
showing "cork screw"  
growth (450X)



B. Large "twisted" granules as found on  
a plant leaf. (40X)

22-Nov-1994 10:37:23

Z: 9 F: 4

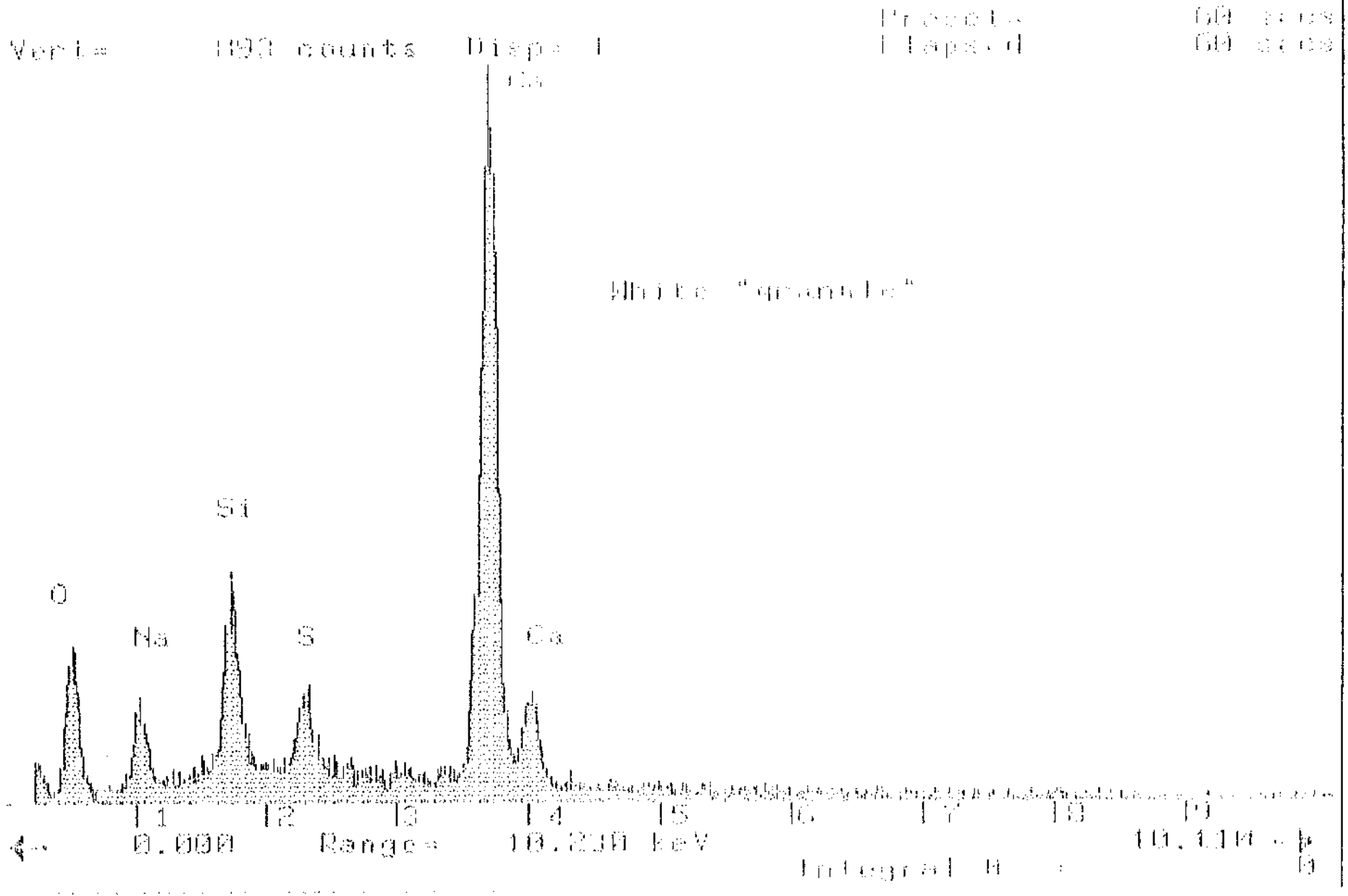


Fig.4 Energy dispersive spectroscopy (EDS) analysis of white granules found at epicenter of a 1994 crop formation in Minnesota (KS-02-104)



Vert = 689 counts Disp = 1 Preset = 64 scans  
Elapsed = 60 scans

Yellow "glass" overall

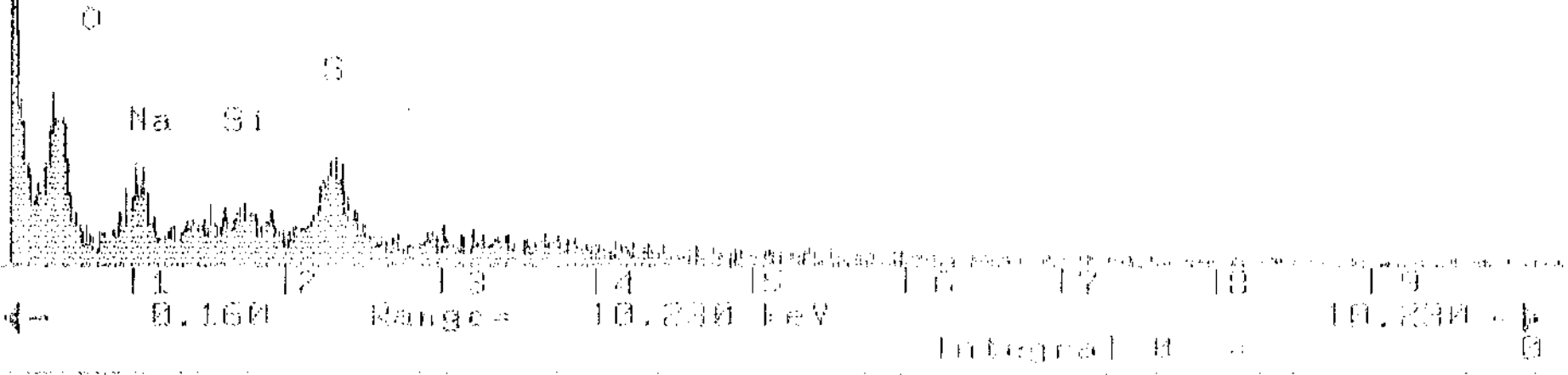


Fig.5 An EDS analysis of amber like substance located at epicenter of a 1994 crop formation in Minnesota (KS-02-104)

Waste 1010 counts Map 1

Proxels 64  
Elapeds 64

KS-02-104  
Sample 10  
Heavy area

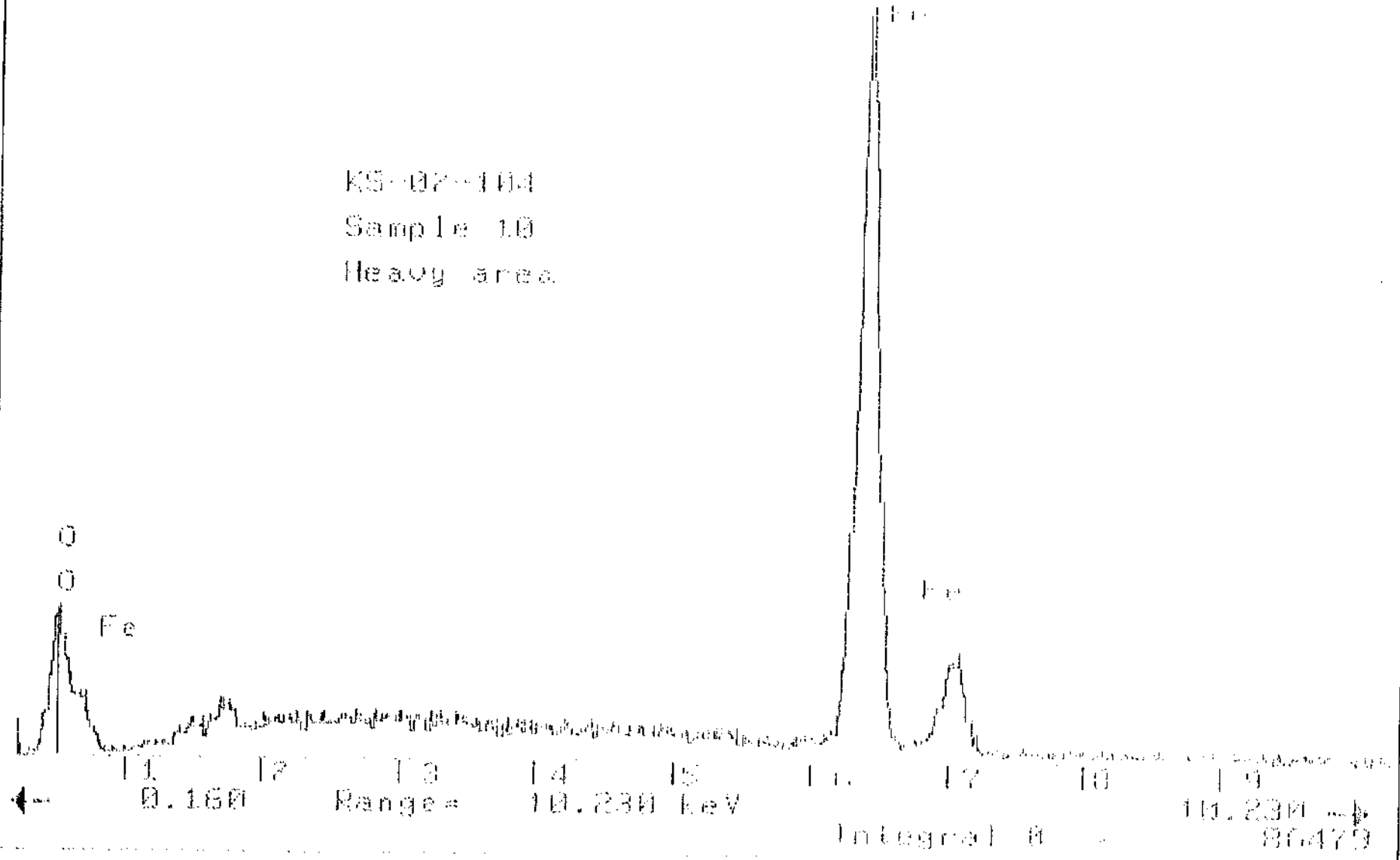


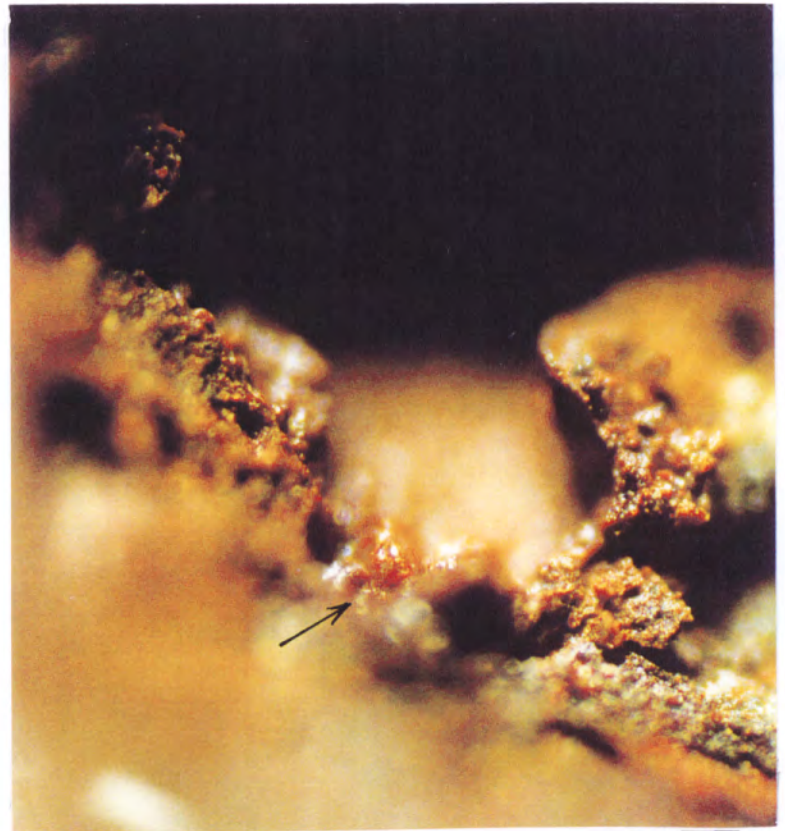
Fig.6 An EDS analysis of magnetic material (spherules) from the epicenter of a 1994, Minnesota crop formation (KS-02-104). Shows presence of pure iron oxide.

Fig.7 Commingled iron oxides found in 1995 magnet drags at the site of a 1994 crop formation in Minnesota - field plowed between the drags. The characteristics of the material suggest a 1995 interaction between the Perseid meteor shower and the crop formation energies.

(KS-02-104)



A. "Pillar" of magentite particles showing mutual magnetic induction (450X)



B. Cavity inside a large chunk of soil-hematite mixture. Arrow indicates a dome of magnetic-glaze containing minute stress cracks. Similar appearance to those found in UK sample in 1993. (100X)