

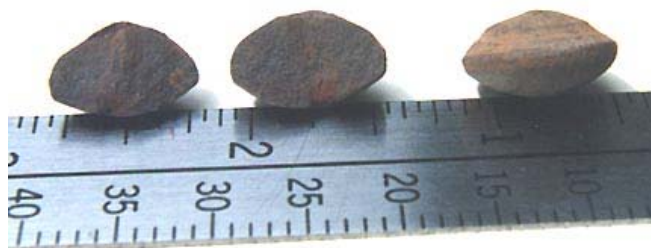


Part 4 - Geologists Run X-Ray Diffractometer on Corguinho, Brazil Stones

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"You have presented us with objects that are well outside the things we have encountered before, outside our experience."

- Art Johnson, Ph.D., Professor of Geology, Univ. of
Pennsylvania



Earthfiles, news category.

Left: The two halves of Stone 2 split by analytical chemist, Phyllis Budinger, for infrared study and EDS plots. **Right:** Stone 1, in profile to show disk-shape. Stone 1 is 16mm in diameter and weighs 3.2051 grams. Stone 2, before being broken in two, was also 16mm in diameter and weighed 3.3068 grams. Both Stone 1 and Stone 2 were collected by Brazil businessman, Felipe Branco, on September 15, 2002 after the "rain of rocks" on the Urandir Oliveira farm in Corguinho, Brazil. Photograph © 2003 by Linda Moulton Howe.



Melted rock sample from shallow crater on Corguinho, Brazil hilltop discovered in October 2000 by local residents who saw a light come down out of the sky toward the hill and rise up again. Photograph © 2003 by Linda Moulton Howe.

June 6, 2003 Philadelphia, Pennsylvania - Biophysicists W. C. Levengood's observations about the titanium and magnetic quality of the Corguinho, Brazil stones were reinforced by the x-ray diffractometry (XRD) work done May 22-23 at the University of Pennsylvania. Prof. Johnson, whose field is soil analysis, had selected nine objects from my rock trays and collection bags. I also gave him two halves of Stone 2 that Phyllis Budinger had split open. During the first XRD run, he was joined by Prof. Gomaa Omar, an eminent rock expert, and another

geologist who specializes in rare earth isotopes. First up was one half of Stone 2, which they called the "button" on the XRD analysis shown below.

Second was a piece of the melted rock that local Corguinho eyewitnesses found in October 2000 after a light came down to the top of a hill and took off again. That rock was arbitrarily labeled "lightening strike" because Dr. Omar said very high temperature had to have been involved.

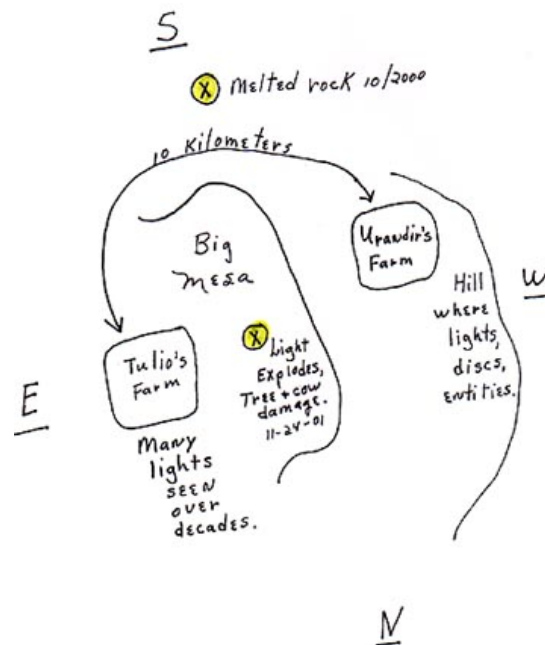
Melted Rock Background



Linda Moulton Howe standing at the crater of melted rock on February 14, 2003, on the hilltop that local eyewitnesses said in October 2000 a light came down from the sky and went back up again. Behind is the large Corguinho, Brazil mesa.
Photograph © 2003 by Felipe Branco.



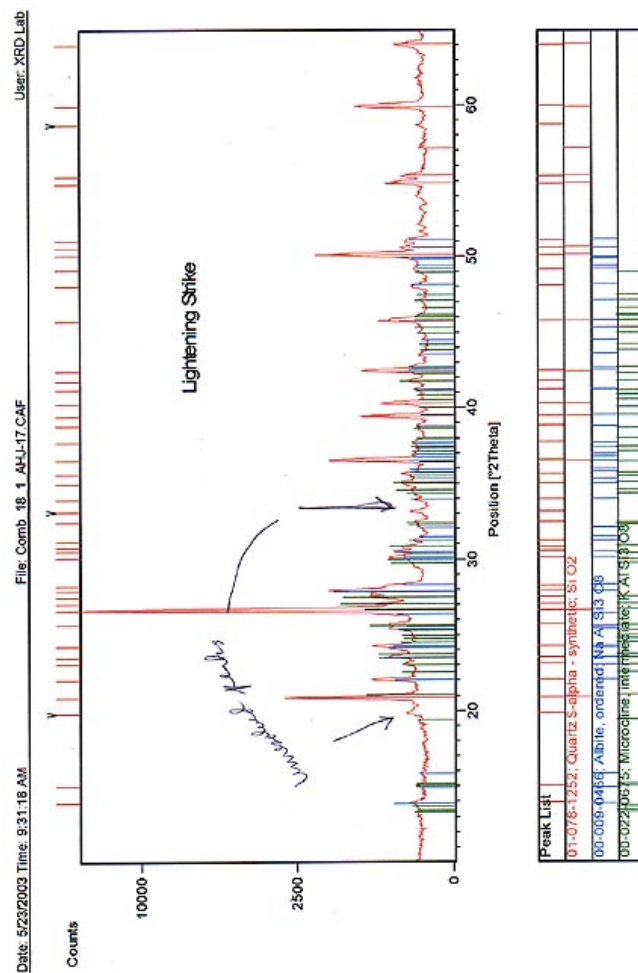
In upper right the pink gouge in the black melted rock is where Urandir Oliveira broke out two pieces of the rock for scientists to investigate.
Photograph © 2003 by Linda Moulton Howe.



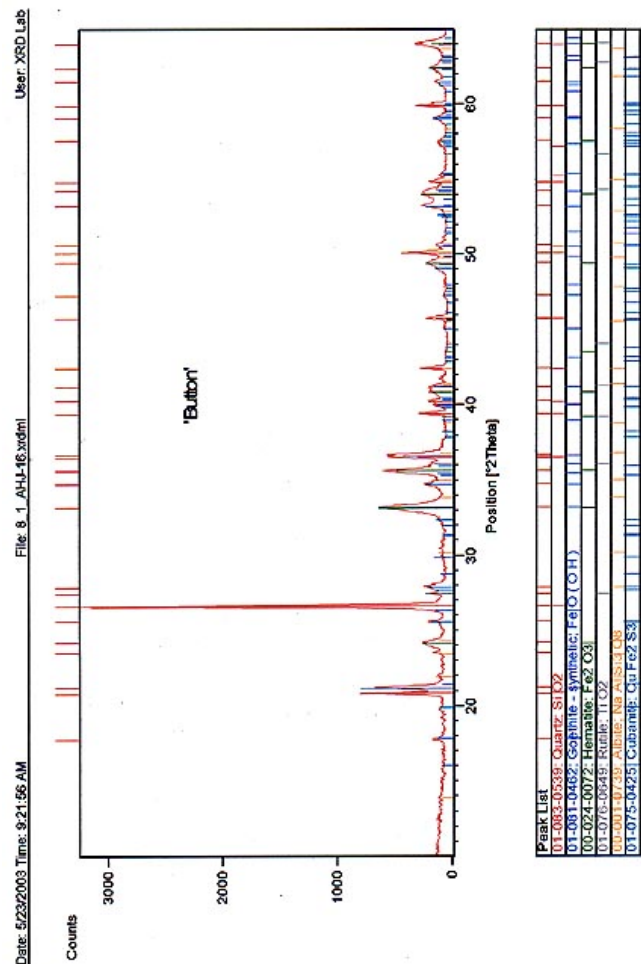
Map hand drawn by Linda in Corguinho, Brazil for orientation about events, dates and locations.

X-Ray Diffractometry

At the University of Pennsylvania, after six minute runs on May 22, 2003, there were two unresolved peaks in the "lightening strike" rock and it was decided to run both Stone 2 and the melted rock all night so the x-rays deflecting off the atomic planes in the mineral crystals of each rock would be able to make more "counts" for better accuracy. The XRD results are shown below with the melted rock on top and Stone 2 afterward. The graphics are on their side in order to accommodate larger size and reading clarity at Earthfiles.com. I apologize that my html software does not allow subscripts for the numbers in the chemical formulas as they should be subscripted.



The melted rock still has two unresolved peaks in addition to the three elements on the Peak List that make up probably 99% of its minerals: Quartz, Albite and Microcline. Rare earth isotope analysis might resolve what the unidentified peaks are and that research is underway. XRDs provided by the University of Pennsylvania Department of Earth and Environmental Science.



XRD was done across the interior of one half of Stone 2. It's Peak List arranged by quantity starts with Quartz, Goethite, Hematite, Rutile (which contains titanium), Albite and Cubanite.

XRD was done across the interior of one half of Stone 2. It's Peak List arranged by quantity starts with Quartz, Goethite, Hematite, Rutile (which contains titanium), Albite and Cubanite. That last name on the Peak List, is Cubanite (CuFe₂S₃ and I apologize my software won't make subscripts of the numbers), a copper-iron sulphide mineral that occurs in copper-zinc deposits and is named after its first discovery in Cuba. Prof. Johnson told me he had never heard of Cubanite before and it was not familiar to the geology group running the XRD. In an article entitled, *Canadian Rockhound Geological Magazine* at canadianrockhound.com, David Joyce and Dirk Schmid wrote, "The mineral (Cubanite) is rare and can be differentiated from chalcopyrite on the basis of magnetism, which is strong in Cubanite. As a crystal, Cubanite forms a 6-pointed star with the points radiating from a common center."



Cubanite, CuFe₂S₃, crystal from the Thompson Mine in Thompson, Manitoba, Canada, a large nickel mine.

Another form of Cubanite, Pyrrhotite, Dolomite (CuFe₂S₃) was found in Brazil

at the Morro Velho mine, Nova Lima, Minas Gerais, Southeast Region, which is the opposite from Corguinho in the state of Mato Grosso do Sul in north central Brazil.



Cubanite, Pyrrhotite, Dolomite (CuFe₂S₃) crystals
found in the Morro Velho mine, Nova Lima, Minas Gerais,
Southeast Region, Brazil. Photograph © 2002 by John H. Betts.

Thus, biophysicist W. C. Levengood is right about the magnetic field he has discovered in the Corguinho, Brazil stones he has been studying in his laboratory. But it is rutile on the XRD Peak List that contains the titanium, not ilmenite.

The geologists are intrigued by current data from both samples and now rare earth isotope and other studies are ongoing. Professor Johnson told me this week, "You have presented us with objects that are well outside the things we have encountered before, outside our experience."

Websites:

<http://www.canadianrockhound.com>

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