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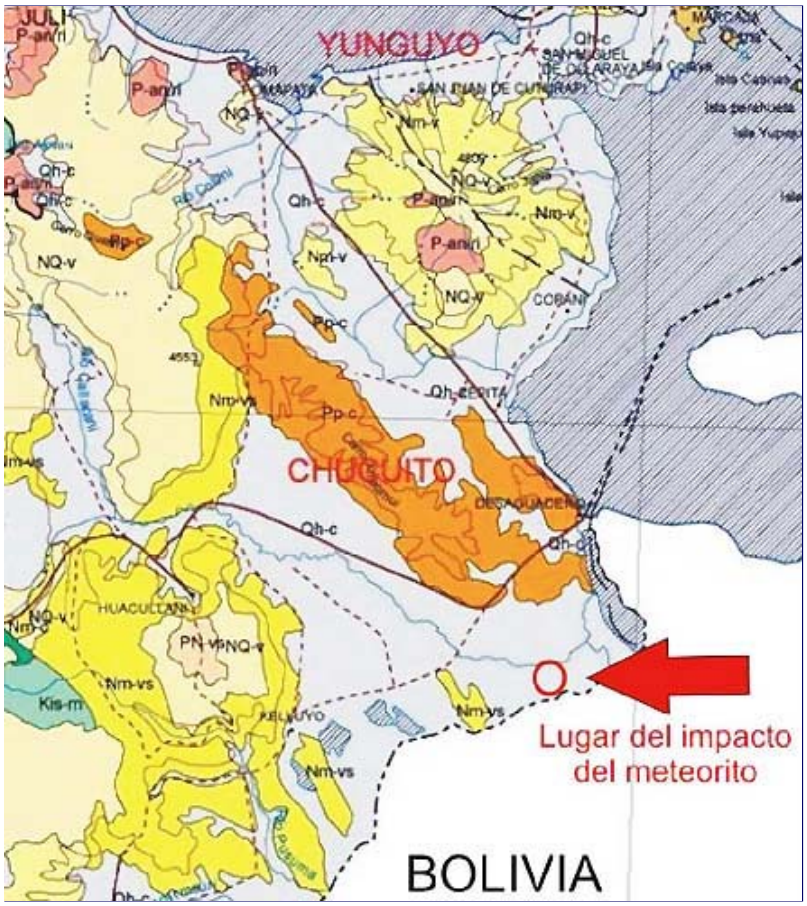
Meteorite Fell in Carancas, Peru - Not Satellite

Not far from Lake Titicaca and Puno in southern Peru, is the small farming town of Carancas on a high Andean plateau near the Bolivian border (pink circle below Desaguadero).

Earthfiles, news category.



Red circle and arrow identify meteorite impact crater site in Carancas, Peru, south of Yunguyo at the southern end of Lake Titicaca.
Map created by Jose Machare, Ingemmet.

Meteorite crater filled with ground water after 11:34 AM impact on September 15, 2007, in Carancas, Peru, south of Lake Titicaca near Bolivian border. Hole diameter measured between 7.4 to 7.8 meters (26 feet). Ring boundary of ejecta around hole measured between 13.3 to 13.8 meters in diameter.
Crater depth to groundwater estimated about 2 meters.

September 26, 2007 Lima, Peru - It was 11:45 AM on Saturday, September 15, 2007,

when alpaca farmer, Justina Limache, heard a “thunderous roar from the sky.” Scared, she grabbed her 8-year-old granddaughter and ran into her house. For the next few minutes, Justina heard rocks raining down on the roof so loudly that she worried her house would collapse. What 74-year-old Justina Limache did not know was that a meteorite had fallen near her Carancas, Peru, home 62 miles (100 kilometers) southeast of Puno and not far from Lake Titicaca. Carancas is a farm community of about 2,000 people who raise cows, alpacas, llamas and other animals on the high Andean plateau near the Bolivian border.

Llama overlooking Machu Picchu, Peru,

Pair of alpacas near Inca burial site in Peru,

According to Jorge Lopez, Director, Puno Health Department, at least two hundred residents suffered headaches, nausea and breathing problems after inhaling "toxic fumes" emitted from the crater hole measured at 26 feet in diameter and several feet deep where ground water seeped in.

On September 24, 2007, I contacted Jose Machare, Science Doctorate and Geological Engineer, Geology, Mining and Metallurgical Institute in Lima. Dr. Machare and his colleague, Luisa Macedo F., have overseen the analysis of the crater water, soil and some meteoritic fragments. Their first preliminary report with images is reproduced below in its entirety.

I asked Dr. Machare if he was able to confirm that a physical meteorite from outer space had slammed into the Carancas, Peru, landscape.

Interview:

Jose Machare, Science Doctorate and Geological Engineer, Ingemmet (Geology, Mining and Metallurgical Institute), Lima, Peru: "We have recovered some pieces of the meteorite.

HOW MUCH METEORITE DID YOU RECOVER?

Just some small pieces of 5 centimeters (2 inches). The fragments were collected first by the local police (from residents who gathered them) and the police gave us some pieces. [See preliminary report below.]

WHERE IS THE REST OF THE METEORITE?

We are not sure. We are trying in the next days to identify if parts of the remaining meteorite are still in the Earth below the small lake that is in the crater. The small crater is about 7.5 meters in diameter with a lake in the center. We cannot see what is inside.

Carancas, Peru, meteorite crater and groundwater.

WHERE DID THE WATER COME FROM?

It is ground water that came out right after the impact. The water table is about one meter below the surface, very high water table. So, ground water was impacted and now it appears within the crater.

Carancas, Peru, meteorite crater and groundwater.

WHAT MADE THE PEOPLE AND ANIMALS SICK?

We don't know exactly because we are still analyzing waters. We have water samples from a couple days ago to see if there is any harmful element. But we don't know exactly was the cause of the illness of people.

AT SPACEWEATHER.COM, IT HAS BEEN REPORTED THAT THE GROUND IS FULL OF ARSENIC AND THAT IT IS ARSENIC THAT MADE THE PEOPLE AND ANIMALS SICK. I AM READING FROM SPACEWEATHER.COM: 'THE CRASH SITE COINCIDES WITH A NATURAL UNDERGROUND DEPOSIT OF ARSENIC.'

No. This is not proven. We have not released this news because we have not performed the water and soil analysis up to now. So that is not correct information. I understand from the first day, there has been anecdotal information about the sickness of people and supposing about arsenic or other components. But nobody has released clear chemical analyses for either the water or remaining dust or fragments of the meteorite. We will have this information in two or three days.

DO YOU THINK ARSENIC IS IN THE SOIL THERE?

Normal composition includes some arsenic, but it's not a main component of the soils.

WHERE DO YOU THINK THAT SPACEWEATHER.COM WOULD RECEIVE THIS INFORMATION AND POST IT AS A HEADLINE TODAY?

Really, I don't know. I have not released information at least to them about these possible contents of arsenic and that arsenic was the cause of the sickness. It was not our information.

YOU WON'T HAVE FINAL RESULTS FOR TWO OR THREE DAYS?

Yes, we will have the information in two or three days (by September 27 or 28).

AS A MINING ENGINEER, WHAT DO YOU THINK WAS IN THE SOIL THAT MADE THE PEOPLE AND ANIMALS SICK?

(laughs) Yes, this is a question I prefer not to answer because really I don't know. I would prefer to have the results first to explain that, yes?

"American Satellite" Hit Carancas,

Claimed Russia's *Pravda*

ONE OTHER CONTROVERSIAL HEADLINE HAS COME FROM RUSSIA. THE *PRAVDA* NEWSPAPER SAYS THAT IT WAS NOT A METEORITE THAT CAME DOWN IN PERU, BUT THAT IT WAS AN AMERICAN SATELLITE.

(laughs) Yes, it was talked about just after the crash, but looking at the samples we are sure now it's a rock, a meteorite.

WHAT WOULD HAVE MADE THE GROUND WATER BOIL WHEN THIS IMPACTED?

We suppose that it boiled only from anecdotal arguments from witnesses. We were not there. If it boiled, I imagine it was because the meteorite was still hot.

VERY HOT. WOULD THE COMPOSITION OF THIS METEORITE, WHICH IS LARGELY SILICATE, WITH SOME IRON AND IRON SULFATE, BE ABLE TO GET VERY HOT?

We don't really know. I don't really know. I don't have an answer for this question."

Carancas Meteorite - Preliminary Report

The Carancas Meteorite Fall, 15 September 2007

Official INGEMMET Initial Report

Released 21 September 2007 (Without Final Lab Test Results)

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Impact location

Country	Peru		
Region	Puno		
Province	Chucuito		
District	Desaguadero		
Community	Carancas		
Coordinates	Lat: 16°39'52"S	Long: 69°02'38"W	Elev: 3 824 m a.s.l.

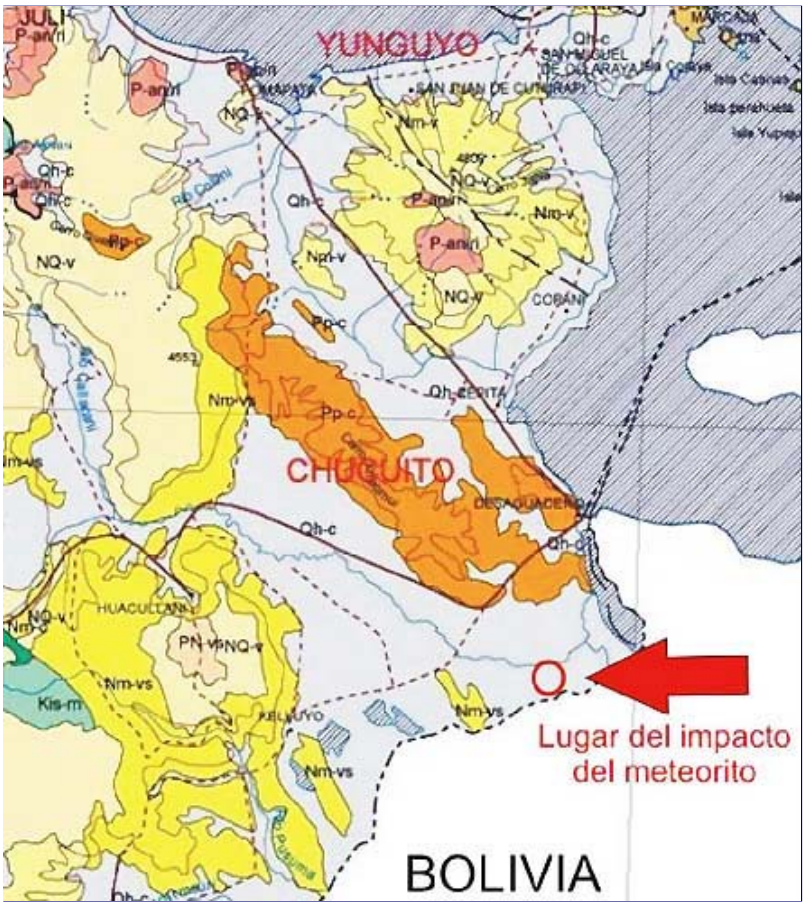

Figure 1.- Location map.

Impact date and time

Day	15 September 2007
Local time:	11:45 h
World time	19:45 h

Geological setting

The impact point is locates in a high plateau (Puna) formed upon a Cenozoic continental sedimentary rocks (molasses or red beds: siltsones, shales and slates) of the Puno Group (Palacios, 1993). The zone displays the development of a few meters thick reddish brown soil.

General description of the phenomenon
***(Only anecdotic information based upon witnesses' declarations*)**

Apparent displacement azimuth of the object: towards N030°E.
The object was observed since it was at about 1 000 m from the earth surface.
The object presented a strongly luminous head (white light) and a white smoky queue.
No other objects were observed to fall after the main body.
There was a strong explosion that was felt up to Desaguadero city 20 km from the impact site. Some window glasses of the Local Health Center (at 1 km from the site) were broken.
The explosion "sound" lasts about 15 minutes (!)
After the impact, boiling water was seen in the crater, and a smoke column was formed that lasts for several minutes. A "sulfurous" smell was reported there.

General description of effects on ground

The impact created a crater when collided with the soft ground (reddish brown soil). The crater is composed by a hole and an ejecta rim. The central hole became a pond, by infill with groundwater that crops out after the impact (figure 2). The following table gives the diameters and other measures of the geoform.

Strike	Pond border (m)	Rim boundary (m)	N
N - S	7.40	13.30	
E - W	7.80	13.80	

The maximum rim height was 1 m above the original soil level, and was seen in the northern border. The photo of figure 2 is looking northward. Dispersal ejecta made by brown soil with grey patina (meteorite powder), up to 5 cm in diameter were found at 200 m from the impact point.

Three days after the fall, water in the pond was 1 m below the original soil level. It presented turbid brown aspect, with pH = 7.8, temperature 17.9°C, conductivity > 4000 milisiems, and total suspended solids > 2000 ppm. (Measurements by Prof. Mario Soto, Univ. of Altiplano, Puno).

Figure 2.- Carancas crater lake and ejecta rim. Looking to the north.

First results of meteorite samples analyzed

Sampling by the INGEMMET scientist has been only partial. When she arrived, 36 hours later than the impact occurred, most major fragments had been taken by villagers.

Naked-eye observations show fine grained, light grey, fragile rocky material with disseminated iron of 1mm diameter (figures 4, 5, and 6).
MORE IMAGES TO BE ADDED.

Thin and polished sections were prepared for petro-mineralogic determinations under optical microscope. They revealed chondritic texture, and a mineral composition including pyroxene, olivine, iron, troilite, and alkali (?) feldspar.

Fig. 5 Natural aspect with iron oxide inclusion.

Thin and polished sections were prepared for petro-mineralogic determinations under optical microscope. The results revealed chondritic texture and a mineral composition including:

Pyroxene 1	40%
Olivine	20%
Feldspar	10%
Pyroxene 2	10%

Opaque minerals total about 20% and include:

Kamacite	15%
Troilite	5%
Cromite	traces
Native Cu	traces

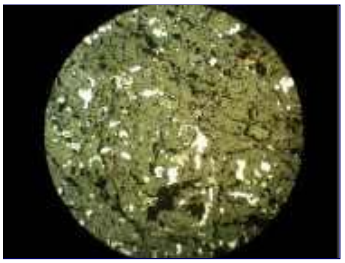

Figure 8.- Polished section of the Carancas meteorite.

Ongoing and proposed further studies

Initial results will be complemented and refined with ICP-MS chemical analysis and SEM-Edax analysis being done in Peru. Results are expected at the beginning of the next week.

Several world scientists have offered to participate with special tests including oxygen isotope analyses to study the origin, ESEM and FESEM studies and determinations of C/N and C/S ratios in any interesting embedded microstructures, and FE ASEM probing to characterize impact microstructures.

Water from the pond as well as soil samples from the impact zone are being analyzed for chemical composition in Peru.

Final considerations

Scientists from the Peruvian Institute of Nuclear Energy have reported that non radioactive material was detected in association with the sampled object.

From our field observations and information given by the Puno Regional Health Director, the initial report about 200 people affected by headache, vomits and stomachache seems exaggerated. Ill people would be around 30, and additional 20 children from the local school are being examined. Causes of illness are still unknown.

Owing to the social issues associated with the impact, new results will continue to reach first the Instituto de Defensa Civil (INDECI) which authorize their public release.

It is recommended to protect the site to preserve the field evidence and allow further research.

Acknowledgements

Instituto Nacional de Defensa Civil
Municipalidad de Desaguadero
Universidad Nacional del Altiplano
Gobierno Regional de Puno

Participants

Field geology: Luisa Macedo
Petro-mineralogy: Teresa Velarde, Cesar Cánepa, Hans-Jürgen Bernhardt, Laura Plascencia.

Geochemistry: Vicentina Cruz
Coordination: José Macharé
Information: Hernando Núñez del Prado, Rosana Ramírez.

To be continued in update about soil and water analyses.

More Information:

For further reports about meteorites, impact craters, comets and planetary geology, please see reports below in the **Earthfiles Archive:**

• 12/15/2006 — Stardust Comet Mission Reports New Kind of Organics
• 12/08/2006 — NASA Wants Permanent Moon Base by 2024
• 12/01/2006 — Deep Impact and Stardust: Are Comets Made of the Same Stuff?
• 08/19/2006 — Red Rain Cells of Kerala, India - Still No Definite DNA
• 09/16/2005 — "Planet X" and the Kuiper Belt's Oddballs, "Santa" and "Easterbunny"
• 08/12/2005 — Deep Impact Spectra: Carbonate, PAHs and Some Amino Precursors in Comet Tempel I
• 07/10/2005 — First Data from Deep Impact Crash Into Comet Tempel I
• 06/29/2005 — July 3-4, 2005: NASA "Deep Impact" Spacecraft to Blast Hole in Comet Temple I
• 04/20/2005 — Outer Space Impact At Serpent Mound, Ohio, 256 Million Years Ago
• 04/01/2005 — What's Killing Off Marine Life Every 62 Million Years?
• 03/20/2005 — Astronaut John Young: "The Moon Can Save Earth's Civilization."
• 01/13/2005 — NASA "Deep Space" Craft Will Hit Comet On July 4, 2005
• 12/17/2004 — Is Our Solar System's Red, Mysterious Sedna An Alien Planetoid?
• 11/17/2004 — European Space Agency's SMART-1 Satellite Begins Moon Orbit
• 09/20/2004 — Part 1: Martian Water Vapor and Methane Overlap in Equatorial Regions
• 06/25/2004 — Wild 2, An Amazing Comet
• 03/31/2004 — Methane on Mars - Biology? Volcanic?
• 03/15/2004 — Most Distant "Icy Planetoid" in Our Solar System Has A Most Baffling Orbit
• 01/09/2004 — Robotic "Geologists" on Mars
• 09/02/2003 — Updated - Astronomers Don't Think Asteroid Will Hit Earth in 2014
• 03/07/2003 — Scientist's Record Sun's Plasma Interaction with Comet NEAT
• 01/05/2003 — What Are the Grooves in the Martian South Pole?
• 10/22/2002 — U. S. DOD Satellites Detected Explosion of Siberian Bolide
• 10/07/2002 — Large Kuiper Belt Planetoid Found Beyond Pluto
• 08/16/2002 — Did CONTOUR Probe Break Apart Or Disappear Into Space?
• 07/25/2002 — Mile and A Half Diameter Asteroid 2002 NT7 Might Impact Earth in 2019
• 07/11/2002 — Hubble Telescope Photographs Seven Objects Traveling In Pairs Beyond Pluto
• 06/01/2002 — Scientists Surprised by Abundance of Water On Mars
• 02/24/2002 — Mysterious Slowing of Pioneer Spacecraft 7 Billion Miles from Earth
• 01/26/2002 — Something Is Perturbing Comet Orbits in the Oort Cloud Surrounding Our Solar System
• 12/01/2001 — 1200 B. C. - What Caused Earthquake Storms, Global Drought and End of Bronze Age?
• 11/19/2001 — Update on Underwater Megalithic Structures near Western Cuba
• 11/10/2001 — The Orion Constellation and the Pyramids of Giza
• 04/21/2001 — April 1986: After Chernobyl Melt Down, What Flew Over Mannheim, Germany?
• 01/14/2001 — An Australian Zircon Crystal is 4.4 Billion Years Old
• 01/07/2001 — Dinosaur-Killing Asteroid Punched 22 Miles Through Earth's Entire Crust
• 12/24/2000 — Martian Bacteria?
• 12/03/2000 — Bacteria from Outer Space?
• 10/01/2000 — A Search for Earth's First Life
• 06/26/2000 — 250 Photographs of Mars Show Signs of Water
• 03/11/2000 — Is 433 Eros Asteroid Younger Than Expected?
• 02/16/2000 — 433 Eros, Orbiting An Asteroid Up Close
• 12/02/1999 — Is There Water - And Life - On Mars?
• 10/25/1999 — A Mysterious "Perturber" at the Edges of Our Solar System
• 08/28/1999 — Oddball Quasar and Salt Water Inside Meteorite
• 06/27/1999 — Microbes Two Miles Below Earth Surface in South Africa
• 06/15/1999 — Current Brightest Binocular Comet and Upcoming Solar Eclipse
• 02/01/1999 — Astronomy Updates with Brian Marsden and John Huchra, Harvard

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Website:

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