

It came from Outer Space?

By Colin Johnston, Science Communicator

Here's a story which could be taken from recent news reports. A meteor falls from space on a remote rural area, blasting a massive crater. The first scientific investigators on the scene are baffled for they cannot find any fragments of meteoric material. Meanwhile, a mysterious something emanates from the crater site, animals sicken and die, then people start to feel ill...something alien and terrible has fallen to Earth.

This is the start of the classic 1927 horror story 'The Colour out of Space' by Howard Philips Lovecraft (1890-1937). In the story a series of increasingly bizarre and terrifying events follow; it's still a good story for a Halloween night. (Lovecraft originally wanted to be a professional astronomer and his knowledge informs this and his other stories. In his youth, he edited, circulated and largely wrote an astronomy newsletter. I wonder if any copies of this publication have survived, knowing the dense, lurid prose Lovecraft affected it may have been an unusual read.) Coming up to date, reality seemed to be imitating fiction on 15 September 2007, when something fell from the sky near the hitherto little-known village of Carancas, Peru, leaving a huge crater- yet no meteorite was found. Noxious fumes from the impact site caused a range of unpleasant symptoms in about six hundred local people. Worse still, animals, including a bull llama (sic) and a sheep, died from the fallen object's malign influence. This event was strange in many other ways; the crater looks unusual and witnesses reported that it rapidly filled with boiling water.

This last point is particularly strange. Naively it seems reasonable that a hot meteorite, incandescent from its atmospheric entry, might embed itself in the earth and heat up any groundwater.

This is unlikely to be the case. Contrary to their Hollywood portrayal; freshly fallen meteorites may actually be cold. After all, they have drifted through chilly interplanetary space for aeons; during their entrance to the atmosphere the meteor's outside will be white hot, but the interior will scarcely feel this. Furthermore, atmospheric drag will substantially slow down the average meteor from its interplanetary velocity of about 10 km/s to a few tens of metres per second by the end of its descent. The meteorite may actually be cooled as it falls through the air. There are some reliable reports of freshly fallen meteorites being covered in frost!

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What about the foul, possibly toxic gases released by the impact? The usually reliable Bad Astronomer (Dr Phil Plait) had a startling theory: his website reported the suggestion that what fell on Carancas was not extra-terrestrial, but instead a Scud-type ballistic missile belonging to the Peruvian army. Missiles of this family use as propellants the extremely unwholesome chemicals red fuming nitric acid and unsymmetrical dimethylhydrazine (“a devil's brew” according to rocket pioneer Sergei Korolev). Perhaps a test flight had gone wrong and deposited an unarmed missile on the village, and fumes from residual propellants were responsible for the symptoms and animal fatalities.

While interesting, this theory has little to commend it; no missile components were found and as far as is known Peru has no Scuds, nor do any of the neighbouring countries. It does indeed



Image Credit: www.amazon.co.uk

Cosmic Horror Story Thankfully the people of Carancas have not met with the same awful fate as the luckless Gardner family from the story.

seem that Carancas had received a visitation from space. Weeks later, it is possible to piece together what really happened.

Witnesses in the city of Desaguadero (20 kilometres north of Carancas) saw the meteor flash over head at 1145 local time. It thudded into water-saturated soil, the impact breaking windows up to a kilometre away. The resulting crater measured 13.3 by 13.8 m and filled with water, which witnesses reported to be hot and steaming. This is the most mysterious element of the whole story. Clark Chapman of the Southwest Research Institute in the US was quoted as saying "It makes no sense that the water was actually boiling". Lionel Jackson, of the Geological



Image Credit: Mike Farmer via www.meteorhunter.com

The Hole Truth This photo shows the right side of the crater, and meteorite hunter Mike Farmer with local policemen who accompanied him to the site.

Survey of Canada, disagrees and suggests that the meteorite's kinetic energy would be enough to heat up the water. Possible seismic records of the impact could be used to determine the meteorite's speed (and therefore energy) and settle the issue.

“What fell on Carancas was indeed a stony meteorite”

After several days, scientists from the Peruvian Institute for Geology, Mining and Metallurgy proved that the crater was formed by an object from outer space. They found “fine-grained, light grey, fragile rocky material, with disseminated iron [particles] of one-millimetre diameter”. Tiny silicate spheres characteristic of meteorites were discovered in thin sections through this debris. What fell on Carancas was indeed a stony meteorite, possibly just one part of a larger body which fragmented at high altitude. The fragments recovered are chondrites - like about 85 percent of the meteorites found on Earth. A chondrite cut open and polished is revealed to be made of a myriad of millimetre-sized objects that were originally free-floating droplets of stone drifting through the early Solar System before accreting together.

By the end of September, Mike Farmer (owner of www.meteorhunter.com) had traveled to the scene. He recovered more fragments of chondrites and purchased some from local people. Farmer has expressed concern that the bulk of the meteorite, which he estimated weighs ten tonnes or so, is steadily deteriorating as it lies in the still water-filled crater. By the time he left the area, the community was planning to excavate the meteorite.

The early claims of hundreds of people struck ill after by the impact are now known to be exaggerated. Only about thirty complaints of headaches and nausea and similar ailments were reported, and no common cause was found, possibly the shock of receiving an actual bolt from the blue unsettled the villagers, prompting what specialists call a Mass Sociogenic Illness. Presumably those afflicted have recovered and eventually stories of “the Day of the Meteorite” will be passed down to thrill children in the village for generations to come. The true fates of

the reportedly deceased llama and sheep have yet to be confirmed.

There yet may be more excitement in the future for Carancas. Porfirio Aguilar, the local director of tourism has announced that he would get together with businessmen and local government to promote meteorite-themed tourism in the area!



Image Credit: Mike Farmer via www.meteorhunter.com

Meteorite fragments These are the largest pieces of this meteorite that Mike Farmer managed to acquire. The meteorite seems to be very fragile, whether naturally or from the pressure of the impact with planet Earth.