

GEOMYTHOLOGY AND METEORITES

GEOMYTHOLOGY AND COSMIC IMPACTS IN AUSTRALIA

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“A star bin fall down. It was a small star, not so big. It fell straight down and hit the ground. It fell straight down and made that hole round, a very deep hole. The earth shook when that star fell down.”

– *Jaru elder Jack Jugarie explaining the formation of the Wolfe Creek Crater (from Reeves-Sanday, 2007: 26).*

Myths and legends are taught as an important component of cultural history and heritage, but are viewed by many as little more than fairy tales. Rife with supernatural deities, unphysical acts of strength and prowess, and fictional creatures, the very concept of examining them for scientific content is frowned upon, if not rejected outright. And with anti-science creationists pushing for teaching mythology-as-science, this is not unexpected.

But researchers are finding out something oral cultures have always known – myths and legends (or to use the preferred term, ‘oral traditions’) contain information about nature, survival, cultural practices, and social structure for the peoples that developed them. This information actually does include a scientific component – explanations of the natural world that were used for navigation, calendars, food economics, and agricultural practices. The rising of the Pleiades at dawn may signal the arrival of winter. The behavior of some animals may predict the onset of bad weather. Certain plants may be used to treat ailments and disease. But these oral traditions can also contain information about past geological and astronomical events.

The study of geological events in oral tradition is known as ‘geom mythology’, a term coined by University of Indiana geologist Dorothy Vitaliano (1968). The basis of the discipline is that geological events, such as earthquakes, tsunamis, volcanic eruptions, and meteorite impacts, have been incorporated into myth and legend by the peoples that experienced them.

In 2004, a tsunami on Boxing Day swept across the Indian Ocean, killing thousands. One of the areas hit hard was the Andaman Islands, stretching south from Bangladesh, between India and Myanmar. Scientists visited the islands, fearing the indigenous islanders would have suffered heavy casualties, as they had no warning of the impending wave. To their surprise, all but one of the indigenous communities survived

with minimal casualties. When probed further as to the reason for this, the islanders told them of a legend in their culture that told them if the ocean rapidly receded, they needed to get to high ground so they would not succumb to the huge waves that would ‘eat men’. Their adherence to this legend saved their lives. The one community that suffered heavy casualties had been converted to Christianity and many of their oral traditions were lost (Hamacher & Norris, 2009).

It is hard to stand on the rim of one of Australia’s numerous meteorite craters and not be struck with a sense of awe. It’s also easy to wonder what Aboriginal people thought of these structures. Did they have stories about them? Did these stories involve falling stars or a second sun? While most impact craters are too large to notice with the naked eye and too old to have been witnessed by humans, some are rather small and young, begging the question: if this occurred when humans were in Australia, do any stories of this event survive today?

These are the questions that prompted me to search for answers. And these answers might surprise you.

Impact Craters in Australia

Of the 26 confirmed craters that pockmark the Australian landscape, few are obvious to the naked (and non-geophysically trained) eye. Even fewer would have been formed when people walked this land. But to our excitement, we found that some of these structures do have Aboriginal legends about them – and some indicate a fiery, astronomical origin.

In a recent paper in the *Journal of Astronomical History and Heritage*, my colleague John Goldsmith at Curtin University and I uncovered Aboriginal oral traditions about five impact craters: Henbury, Liverpool, and Gosse’s Bluff craters in the Northern Territory, and Wolfe Creek crater in Western Australia (Hamacher & Goldsmith, 2013). Three of these craters have legends that describe the crater forming from a falling object from the sky.

Gosse’s Bluff Crater

Gosse’s Bluff crater was formed approximately 142 million years ago when a comet struck the Central

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Desert ~130 km west of Alice Springs, creating a crater 22 km in diameter. After millions of years of erosion, what we see today is the central uplift of the complex crater, forming a ring-shaped mountain range 5 km across and 150 m high (Figure 1).



Figure 1: The author at Tnorala (Gosse's Bluff Crater) in 2012.

To the local Arrernte people, this is a sacred place called Tnorala. Arrernte elder Mavis Malbunka explains that in the Dreamtime, a group of eight women were dancing as stars in the Milky Way. One of the women carrying a child placed her baby in a turna (wooden basket) and placed him on the Milky Way so she could dance in the corroboree with the other women. The

baby fell off the Milky Way and plunged to the Earth. The baby hit the ground and was covered by the turna. This action drove the rocks upward to form the circular mountain range we see today. The baby's parents, the morning and evening stars, continue to search for their baby to this day. If you look up at the sky at night, you can see the turna falling from the Milky Way as the stars in Corona Australis – the Southern Crown.

Liverpool Crater

The 1.6 km wide Liverpool crater in western Arnhem Land was formed 150 million years ago. Today it has the distinction of being the only known crater in the world infested with crocodiles. In 1996, Carolyn and Eugene Shoemaker visited Liverpool crater, and were accompanied by an Aboriginal family of the local Kurulk clan. While Eugene conducted a geological survey, the Aboriginal men explained to Carolyn that Liverpool was called Yingundji in their language and that it was the nest of a giant catfish. Numerous rock paintings of catfish filled the walls of the crater, attesting to this tradition.

Wolfe Creek Crater

Near the town of Hall's Creek in northeastern WA lies the second largest rimmed crater in the world: Wolfe Creek crater. Formed from the impact of a nickel-iron

meteorite some 300 000 years ago, Wolfe Creek is 850 m wide and rich in Aboriginal traditions. Called Kandimalal by the local Jaru people, it is evident that many different stories of the crater exist, and some of them have incorporated modern scientific research into the crater. Some elders claim the crater was formed when the Rainbow Serpent emerged from the Earth, forming the crater and the nearby Sturt Creek (Figure 2). Another story tells that it was formed by an 'old fellow' digging for yams in the Dreamtime. But many of the stories claim the crater was formed when the Rainbow Serpent, visible as a bright star, fell from the sky, striking the



Figure 2: Wolfe Creek Crater: The Clancy Family (Frank, May, and children). From <http://www.sas.upenn.edu/%7Eepsanday/Aboriginal/serpent6.html>

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Earth. Across the northern half of Australia, meteors were often seen as the fiery eyes of the Rainbow Serpent, flying across the night sky (Hamacher & Norris, 2010).

Henbury Crater and other stories

The only impact site with associated oral traditions that is known to have formed when humans inhabited Australia is the Henbury crater field. The field consists of 13 craters that were formed when a nickel-iron impactor broke apart as it entered the Earth's atmosphere some 4700 years ago (Figure 3). At such a relatively young age, are there any records that this event survived in oral tradition?



Figure 3: The larger craters of the Henbury field. Photo by the author (2012).

When some of the early researchers took an Aboriginal guide near the site, the men refused to go near them, claiming that their people were forbidden from taking water that collected in the bottoms of some of the craters, fearing that the fire-devil, who came from the sun, would fill them with iron. Another account was nearly identical: 'Schindo waroo chinka yabbo shinna kadicha cooka', meaning 'a fiery devil ran down from the Sun and made his home in the Earth. He will burn and eat any bad blackfellows.' The words are from the Luritja language, one of the three major language groups that cover the area. The Arrernte people call the craters Tatyeye Kepmwere and describe the largest crater as a place where a Mulumura lizard woman sat, throwing handfuls of soil from her camp, forming the crater and the ejecta rays that have since been destroyed by prospecting.

Other stories

It is peculiar that we find no oral traditions regarding the other geologically young craters, such as Boxhole (NT), Dalgara (WA) and Veevers (WA), all of which probably formed during human habitation of Australia. It is certainly possible that traditions may exist that have either been lost or simply not recorded.

However, a significant number of impact events were recorded in Aboriginal oral traditions that do not correspond to a known impact site. These stories describe fiery objects, some as bright as the sun, falling from the sky and striking the ground, creating a deafening roar and brilliant flash (Hamacher & Norris, 2009). This tells us that Aboriginal people have been observing meteors, fireballs, and impact events and recording these events into their oral traditions for a very long time. It also means that there are probably many more impact sites that remain to be discovered. The search continues.

References

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