

Meteors in Australian Aboriginal Dreamings

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We present a comprehensive analysis of Australian Aboriginal accounts of meteors. The data used were taken from anthropological and ethnographic literature describing oral traditions, ceremonies, and Dreamings of 97 Aboriginal groups representing all states of modern Australia. This revealed common themes in the way meteors were viewed between Aboriginal groups, focusing on supernatural events, death, omens, and war. The presence of such themes around Australia was probably due to the unpredictable nature of meteors in an otherwise well-ordered cosmos.

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*Going straight through the middle of Poojoorroona Gap
Tjidara is alight
Flashing like a meteor*^a

^a A poem about *Tjidara*, a long legged goanna that became a star, who played an important role in the Dreamings of the Aboriginal people of Uaroo Station, Western Australia (Von Brandenstein & Thomas 1974, p. 3).

1 Introduction

The history of meteoritics as a scientific discipline has been studied extensively (e.g. McCall et al, 2006), and has incorporated the observations and records of meteoritic phenomena by various cultures around the world (e.g. Burke, 1986; Zanda & Rotaru, 2001). These phenomena have been studied more extensively recently as researchers have gained a better understanding of the frequency and potentially hazardous effects of cosmic impacts (e.g. Melosh, 1989; Gehrels, 1994; Lewis, 1999). While this attention has served to funnel more research into the scientific study of meteoritics, it has focused little on the cultural and anthropological study of meteoritics.

We define Cultural Meteoritics as the study of the influence of meteoritic phenomena and material (including comets, meteors, meteorites, tektites, and cosmic impacts) on society. This includes human interaction with such meteoritic materials, and the role of meteoritic phenomena in art, religion, music, ritual, and mythology. While some researchers have addressed this topic (e.g. Brown, 1975; Bevan & Bindon, 1996; Hughes, 1989; Bobrowsky & Rickman, 2007), the Meteor Beliefs Project (MBP), sponsored by IMO, is the first large-scale study of Cultural Meteoritics.

A majority of the MBP to date has focused on European views of meteors. In order to fill a gap in the literature, we present the first comprehensive study of the perceptions and descriptions of meteors by Aboriginal Australians. Previously, Baker (1957) and Edwards (1966) detailed the use of australites (Australian tektites) in Aboriginal cultures, while Bevan & Bindon (1996) were the first to address the Aboriginal use and

transport of meteorites. Papers on Aboriginal views of comets, and meteorite falls and cosmic impacts, can be found respectively in Hamacher & Norris (2010a & 2010b). Norris & Hamacher (2009) reviewed the wider astronomical themes of Australian Aboriginal cultures.

Within the context of this paper, the term ‘mythology’ is used to refer to a body of stories owned by a particular culture, often invoking the supernatural to explain the nature of the universe and humanity. Such usage does not imply that the beliefs are untrue.

While we use data from many Aboriginal groups across Australia, we do not include data from the Torres Strait Islanders, who are of Melanesian extraction and are distinctly different from Aboriginal Australians (cf. Davis, 2004). Torres Strait Islander views of meteors will be the subject of a future paper.

We note for Aboriginal readers that this paper gives the names of, or references to, Aboriginal people that have passed away, and to information that may be considered sacred to some groups. It also contains information published in “Nomads of the Australian Desert” by Charles P. Mountford (1976), which was banned from sale in the Northern Territory in 1976 as it contained sacred/secret knowledge of the Pitjantjatjara (cf. Brown, 2004, pp. 33–35). No information about the Pitjantjatjara from Mountford’s book is presented in this paper.

2 Meteoric Terminology

In general, we use the standard definitions for words such as ‘meteor’, ‘fireball’ and ‘meteorite’ in the following (those needing more information should see for instance Rendtel & Arlt (2008)). However, we also use the term ‘bolide’, which has no official IAU definition, and which has various meanings in the literature, to refer to an exploding or audible meteor. By ‘audible’, we mean both acoustic (delayed) and electrophonic (simultaneous) meteor sounds, both of which have been noted by different Aboriginal groups. These sounds are often an important component of the story or account, and bolides are so significant that some Aboriginal groups have separate words for them, including the Djaru *gungurru* (Goldsmith, 2000, p. 32) and Mycoolon *goonbor* (Palmer, 1884, p. 294).

We must also note that, as with some cultures discussed in earlier MBP papers, comets and meteors can be conflated. In some Australian Aboriginal languages, the words for ‘comet’ and ‘meteor’ are reported to be the same, such as *nilgoolerburda*, in the Bindel lan-

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guage of northern Queensland (Morrill, 1864, p. 61) and *binnar* in a Western Australian language (Moore, 1842, pp. 126 & 145). In some cases, the description of one may indicate the other. For example, the Yolngu word for meteor, *ngarrpiya*, is also the word for octopus (Lowe, 2004, p. 116). An octopus moving through the water at speed could resemble a meteor (bulbous head leading, trailing tentacles streamlined like a meteor's tail), while some brilliant, usually fragmenting, fireballs can show a multi-tailed nature, sometimes looking briefly quite like a comet, but the simile could equally have indicated a comparison with a multi-tailed comet. It may also have resulted from the linguist or anthropologist confusing the two phenomena. Tindale (1983, p. 376) categorized comets and fireballs together, for example, despite them being different phenomena, though he only discussed the former. Haynes (2000, p. 86) described comets as flaming spears hurled across the heavens by a celestial Pitjantjatjara being named *Wurluru*, something that seems far more meteoric than cometary. To some Arrernte clans, a comet was a sign that a person in a neighboring community had died, with the tail pointing in the direction of the deceased (Spencer & Gillen, 1899, p. 549). A nearly identical description is given by Piddington (1932, p. 394) about the Karadjeri of coastal Western Australia, but attributed to the trajectory of meteors instead of the tails of comets.

We provide 59 Aboriginal words for meteors in Table 1, representing 50 Aboriginal groups from all states of Australia (some groups have more than one word for meteors).

3 Aboriginal Cultures

From approximately 70 000 to 15 000 years before present (BP), the sea level was much lower than it is today (Voris, 2000). During this period, Tasmania, Australia, and New Guinea were a single landmass, called Sahul. While archaeological evidence indicates that humans migrated to Sahul in multiple waves from South East Asia, genetic evidence reveals that current Aboriginal Australians share a common genetic thread with people from southern India, as opposed to Indonesia or Malaysia (Redd & Stoneking, 1999). The exact date of human arrival to Sahul is uncertain, but archaeological evidence indicates that Australia has been inhabited for at least the last 40 000 years (O'Connell & Allen, 2004). Claims for an arrival date before 50 000 years BP are based on uncertain, often disputed, evidence, but because they have survived into the present, even the 40 000 years' BP date makes Australian Aboriginal cultures the oldest continuous cultures in the world (cf. McNiven & Russell 2005, pp. 205–208).

Before the European colonization of Australia, between 350 and 750 distinct Aboriginal groups have been estimated as extant (Walsh, 1991), each with its own distinct language, customs, laws, religious practices and mythology. While adjacent groups often had a similar language and culture, others were very different. Each language group then, as now, was further divided into dialects, clans and smaller units. Laws and traditions

varied, and still vary, between Aboriginal communities, even those of the same language group. For this reason, it is not possible to ask for the 'Aboriginal name of a meteor' or to describe the 'Aboriginal story of a falling star'. While some common themes exist across many Aboriginal groups, such as the concept of the Dreaming, each community sees them differently. For this reason, each reference to a particular Aboriginal story, ethnography, or word in this paper includes the name and location of the Aboriginal group from which it was reported.

'The Dreaming', an English term coined by Francis Gillen in 1896, was adopted by Spencer & Gillen (1899) to refer to a period in the religious mythologies of the Northern Arunta people in the Northern Territory (Dean, 1996). This term is frequently misinterpreted, as it has nothing to do with dreaming in the context of sleep. According to Dean (1996), the Dreaming is viewed by some Aboriginal groups (e.g. the Tiwi and Wuradjeri) as the period during the creation of the world when totemic ancestors came into being, representing a past reality. For other groups, it represents a past, current and future reality, either concurrently parallel to our own reality (e.g. the Ooldea and Warrabri), or within our own reality (e.g. the Murinbata and Mardudjara). In some cases, such as during ritual ceremonies, the past can become the present, so the term 'Dreamtime' used in an all-encompassing sense is not accurate, as it denotes a linear timeline, separating past, present, and future. While oral traditions are a component of the Dreaming, they cannot be thought of purely as mythology. In a general sense, the 'Dreaming' is the embodiment of Aboriginal culture, which includes the songs, stories, and oral traditions, dance, art and ceremonial practices, laws and traditions, magical practices and religion, and a complex social structure. Traditional knowledge is handed down primarily through oral tradition and typically involves a moral charter. Much of this knowledge is considered sacred and secret and is not shared with non-Aboriginal people. Even within the community, some information is secret to men, some is secret to women, and some is secret only to initiated individuals. This is all part of a complex social structure that has been an integral aspect of Aboriginal cultures for tens of thousands of years (cf. Ross, 1986).

As part of the community, people are born into particular 'totems'. A totem may be represented by almost any physical object, for example, an animal, a geographic feature or a celestial phenomenon. In some communities, the totem can be the 'star' or 'falling star', and we have drawn attention to a few specific cases where such Aboriginal totems seem to have meteoric relevance.

4 Methods and Data Collection

We have reviewed the available literature for any references meteoritic phenomena (including 'falling' or 'shooting' stars) in the Aboriginal cultures. These sources included ethnographic and historical data, Dreaming stories and songs, anecdotes, and archaeolog-

Table 1 – Aboriginal terms for ‘meteor’, alphabetized by group name. The state abbreviations are: NSW = New South Wales, NT = Northern Territory, QLD = Queensland, SA = South Australia, TAS = Tasmania, VIC = Victoria, WA = Western Australia.

Group or [area]	State	Word	Reference
Arunta	NT	ulthana	Spencer & Gillen (1927, pp. 415–417)
Awabakal	NSW	Puttikan	Gunson (1974, p. 50)
Badaya/Gurudara	NT	Nyimibili	Berndt & Berndt (1989, pp. 25–27)
Bayungu	WA	gurilyanu	Burgman (2007, p. 39)
Boorong	VIC	Porkelongtoute	Stanbridge (1857, p. 140)
Bundjalung	NSW	yuaroom	Ryan (1963, p. 46)
Burarra-Gun-Nartpa	NT	an-marlpa, nomarrarta	Glasgow (1994, p. 815)
[Cape York]	QLD	titurie udzurra	Moore (1979, p. 156)
Danggali/Barundji	NSW	purli ngaangkalitji	Jones (1989, p. 41)
Dieri	SA	Yaola	Elkin (1937, p. 289)
Djaru	WA	gulungurru	Goldsmith (2000, p. 32)
Djirbalngan	QLD	chiko-binna	Roth (1984, p. 8)
Eora	NSW	duruga	Thieberger & McGregor (1983, p. 4.8)
Gamilaraay	NSW	mirii yanan	Ash et al (2003, p. 202)
Goulburn	NSW	Goorbenee turt	Smyth (1878, p. 116)
Gunditjmarra/Moporrr	VIC	gnummae waar	Dawson (1881, p. 101)
Gumbaynggirr	NSW	gumugan	Morelli (2008, p. 160)
Gunwinggu	NT	jarijaning	Elkin et al (1950/51, p. 258)
Jajowerong	VIC	Yalleenillong	Smyth (1878, p. 162)
Kayardild	QLD	burwaduwwuru	Evans (1992, p. 196)
Kokatha	SA	Wonambi	Harney & Elkin (1949, p. 130)
Kuku-Yalangi	QLD	binyu	Oates (1993, pp. 78–79)
Kuku-Yalangi	QLD	Gi-we	Roth (1984, p. 8)
Kunwinjku	NT	Namorrorddo	Taylor (1996, pp. 189–190)
Lardil	QLD	kuwa thungal	McNight (2005, p. 209)
Lardil	QLD	Thuwathu	Roughsey (1971, p. 26)
Mara	NT	Tjan-wangu-wangu	Spencer & Gillen (1904, pp. 627–628)
Marduthunira	WA	Tjidara	Von Brandenstein & Thomas (1974, pp. 3 & 57)
Martu/Wangka	WA	mayla	Burgman (2005, p. 47)
Mycooloon	QLD	Goonbor (bolide)	Palmer (1884, p. 294)
Mycooloon	QLD	Jinbabora (meteor)	Palmer (1884, p. 294)
Narrunga	SA	wajaga	Black (1920, p. 89)
Ngalia	WA	Walanari	Mountford (1976, p. 457)
Ngarrindjeri	SA	Kulda	Tindale (1983, pp. 374–375)
Plangermairreenner	TAS	Puggareetya	Noonuccal (1990, pp. 115–119)
[Southern Tasmania]	TAS	Pachareah	Milligan (1866, p. 426)
Tanganekald	SA	Kuldalai/Kudai	Tindale (1983, pp. 374–375)
Tiwi	NT	Nimparipari	Berndt & Berndt (1974, p. 81)
Tiwi	NT	Papinjuwari	Mountford (1958, pp. 144–146)
Turrbal (Jagara)	QLD	Kundri	Howitt (1996, p. 429)
Wardaman	NT	Utdjungon	Harney & Elkin (1949, pp. 29–31)
Wardaman	NT	Wuja	Cairns & Harney (2003, p. 65)
Wathi-Wathi	VIC	Tha-tha-puli	Cameron (1885, p. 365)
Weilan	NSW	Gambil Gambil	McKay (2001, pp. 112–114)
Wembawemba	VIC	payika-turt	Thieberger & McGregor (1983, p. 6.8)
[Western Desert]	WA	Wuuna	Tindale (1983, pp. 376–377)
Wik-Mungkan	QLD	Pach-aw (story place)	Hercus et al (2002, p. 77)
Wik-Mungkan	QLD	patja	McConnel (1930/31, p. 205)
Wiradjeri	NSW	girralang buundinya	Thieberger & McGregor (1983, p. 5.8)
Wiradjeri	NSW	kirela	Berndt (1947/48, pp. 78–79)
Wiradjeri	NSW	Kurikuta	Berndt (1974, p. 28)
Worora	WA	mulalai	Blundell & Woolagoodja (2005, p. 4142)
Wotjobaluk	VIC	Yerigauil	Massola (1968, p. 163)
Yarra	VIC	Elalangi	Smyth (1878, p. 103)
Yindjibarndi	WA	garuwarra	Thieberger & McGregor (1983, p. 11.8)
Yolngu	NT	maramara	Lowe (2004, p. 116)
Yolngu	NT	ngarrpiya	Lowe (2004, p. 147)
Yolngu	NT	wulurrk	Lowe (2004, p. 180)
Yupangathi	QLD	cho-i	Roth (1984, p. 8)
[Not Specified]	WA	binnar	Moore (1842, p. 145)

ical data in the form of books, magazine and journal articles, audio and video sources, reputable web-sources, master and doctoral theses. The search produced 229 original references, including 30 references to comets, 150 references to meteors, 28 references to cosmic impacts, and 21 references to known meteorite falls and impact craters. Of the data regarding only meteors, 97 Aboriginal groups were represented. Broken down by state (and using the same abbreviations as in Table 1), the percentage of stories in decreasing order was: NT 26%, QLD 19%, WA 17%, VIC 14%, SA 12%, NSW 9% and TAS 3%.

It should be noted that the accuracy of the data presented here is dominated by the interpretations and views of the authors of the sources used, and does not necessarily represent either contemporary Aboriginal views, or the majority of Aboriginal views. There are often various views found within each Aboriginal group, so statements such as ‘The [Aboriginal group] see meteors as...’ simply denote the Aboriginal community from which the information was taken, and do not necessarily represent the views of that entire community.

Analysis of the data revealed major themes in the perceptions of meteors, the most prominent being an association with death, spirits, or omens. Not all views were negative, however. These are broken down by theme in the following sections.

5 Meteors as Benevolent Spirits

Spirits of the Deceased: The most common association between meteors and death was that they represented spirits, either good or evil. In many cases, meteors represented the benevolent spirits of important individuals, such as with the Worora, Ngarinyin and Wunambal peoples of the Kimberleys (Blundell & Woolagoodja, 2005, p. 41) and the Euahlayi of New South Wales (Parker, 1905, p. 91), while at other times the sight of a meteor simply told the people that “an old blackfella has fallen down there” (Smyth, 1878, p. 309), a reference to the deceased man’s spirit (star) falling from the sky. Meteors signifying someone had died was a view shared by the Aboriginal peoples of the Kimberleys (Kaberry, 1935/36, p. 38; Piddington, 1932, p. 394), Kuku-Yalanji of Queensland (Oates, 1993, p. 79), Dieri of South Australia (Elkin, 1937, p. 289), Kuninjku of Arnhem Land (Taylor, 1996, pp. 189–190), Kurnai of the Gippsland region of Victoria (Massola, 1968, p. 163), Wardaman of the Northern Territory (Harney, 2009) and Wik-Munkan of the Cape York Peninsula (McConnel, 1930/31, p. 183). If a meteor was seen, followed by a large crash, the Euahlayi and Narran of New South Wales believed a great medicine man had died (Parker, 1905, p. 91; Parker, 1978, p. 148). A meteor could signify the action of a spirit, such as with the Aboriginal people near the Pennefather River, Queensland who saw a falling star as the spirit of a woman pouring water over yams to help them grow (Roth, 1984, p. 8). According to the Gunditjmarra near Port Fairy, Victoria, a haunted cave was believed to connect Julia Percy Island with the mainland. When a person died, the body was wrapped in grass and buried. If

grass was found at the mouth of the cave, it was proof that a benevolent spirit, called *Puit puit chepetch*, had removed the body through the cave to the island, and conveyed its spirit to the clouds. If a meteor was seen at the same time, it was believed to be fire taken up with the spirit (Dawson, 1881, pp. 51–52). When a Yerrunthully person (central Queensland) died, they climbed to the sky on a rope. When they reached the top, they dropped the rope, which was seen as a meteor. If the meteor made a booming noise (exploded), it was the sound of the rope hitting the ground (Palmer, 1884, p. 292). An audible meteor could also signify that a person had been dropped as part of a game (Palmer, 1885, p. 174).

Meteors as Flesh: Some groups believed that a deceased person’s flesh could transform into a star or vice-versa. An Aboriginal group on the Lyne River in the Kimberleys believed that when a person died, their flesh became a star (Kaberry, 1935/36, pp. 38–39), while the Andedja and Yeidji peoples believed this only applied to a *Barumannari* (a medicine man or clever man). To the Yijji of the Lyne River, when a female Barumannari died, she took her child into the sky where their flesh became a star (ibid). The Wotjobaluk of Victoria saw a meteor as the falling heart of a man that had been caught by a *Bangal* (medicine man) and deprived of his fat (Howitt, 1996, pp. 368–369). The Yir-Yoront of Cape York Peninsula believed that when a man died, his spirit became a star, with the transformation accompanied by a meteor (Sharp, 1934/35, p. 34). The Karadjeri described the night sky as a dome composed of a hard substance, such as rock or shell, with the stars representing the spirits of the dead (Piddington, 1932, p. 394). One view was that stars were nautilus shells with living fish inside them. A meteor was the dead fish dropping from its shell (ibid). Another view was that meteors represented chunks of flesh falling from a tree where the culture hero Marela was placed when he died (ibid)¹. When a Wardaman person died, their spirit went up and passed through a hole in the sky, which was seen as the star *Garrndarin* (Spica, α Virginis). While in the sky, the spirit appeared as a star and was looked after by the Rock-Cod star *Munin* (Arcturus, α Boötis). The spirit then fell back to Earth as a shooting star, falling into a stream, where the Rock-Cod looked after it again. Eventually the spirit found its mother-to-be, and entered her, to be reincarnated as a baby (Bill Yidumduma Harney, 2009, personal communication).

Spirits Returning Home: To some Aboriginal groups, a meteor signified that the spirit of a person who died far from their home was returning to their home country, such as the Yarralin (aka Walangeri) of the Northern Territory (Rose, 1992, p. 70), Nungubuyu of Arnhem Land (Harney, 1944, pp. 74–75, 79, 163), Yintjingga of Cape York Peninsula (Montagu, 1974, p. 155), Arunta of central Australia, and Kukata and

¹We have a Wajuk account from Perth describing the relationship between meteors and children, but have been unable to contact our informant to obtain permission to share this information.

Narrinyerri of South Australia (Basedow, 1925, p. 296). This view was not confined only to the deceased. The Yolngu of Arnhem Land saw a meteor as a message that a living relative had arrived home safely (Wells, 1964, pp. 42, 59).

6 Meteors as Malevolent Spirits

Many Aboriginal groups associated meteors with evil spirits or magic, such as the Ngarrindjeri of South Australia (Smith, 1970, p. 136). To several groups in the Northern Territory, meteors were the glowing eyes of evil spirit beings (typically serpents) that hunted for the souls of the sick and dying. These beings included the ghoulish *Papinjuwari* from the Tiwi of Bathurst and Melville Islands (Mountford, 1958, pp. 144–146), the clawed *Namorrdodo* from the Kuninjku of Arnhem Land (Taylor, 1996, pp. 189–190 — see also Figure 1 here), the one-eyed *Indada* from the Badaya and Gurudara peoples (Berndt & Berndt, 1989, pp. 25–27), and the serpentine *Thuwathu* from the Lardil of the Wellesley Islands, who called meteors *kuwa thungal*, meaning “eye thing” (McNight, 2005, p. 209). Like Thuwathu, the Luritja and Arrernte of the Central Desert viewed meteors as the fiery eyes of celestial serpents that dropped into deep waterholes (Strehlow, 1907, p. 30). Similarly, the Western and Eastern Aranda compared serpents’ eyes to bright stars (Roheim, 1945, p. 183). According to the Tiwi, when time began, spirits of falling stars (probably the Papinjuwari) searched with blazing eyes for living things to devour. To hide and protect babies from the eyes of evil meteor spirits, an old Tiwi woman named Mudungkala placed the infants in a string bag tied around her neck (Allen, 1975, p. 89).

The Boorong people of northwest Victoria saw a meteor as the evil being, *Porkelongtoute*, who would portend evil to men that had lost a front tooth (initiated men, Stanbridge, 1857, p. 140). This is in contrast to Gunson’s (1974, p. 50) description of the Aboriginal people near Sugarloaf Mountain, outside Newcastle, New South Wales of an evil meteor-being named *Puttikan* that would kill and eat men that did not have a missing front tooth (non-initiated men). The Mara people told of an unfriendly celestial father-son pair called *Minungara*. If a man was sick, the son would come to Earth as a falling star to see how close the man was to death. If he was ‘close-up dead’, the father would come down and suck the blood of the dying man (Spencer & Gillen, 1927, p. 628). An unusual description of a malevolent meteor spirit was found among the Djirbalngan of Eastern Cape York Peninsula. The spirit, called *Jubena*, was associated with cooked eggs burnt on coals (which were seen as falling stars), and would hunt down people and tickle them to death (Dixon, 1964). If a meteor broke apart in the atmosphere, an Aboriginal community in Cape York Peninsula called it *titurie udzurra*, a spirit with lots of ‘young ones’, that caused great fear among those who saw it (Moore, 1979, p. 156).

Two nearly identical stories from opposite ends of the continent told how meteors represented an evil being flying across the skies. These stories came from the Weilan people of northern New South Wales (June

Barker in McKay, 2001, pp. 112–114) and the Ooungyee people of the Kimberleys in Western Australia (Sawtell, 1955). Both stories described people disappearing from an Aboriginal camp near a waterhole. Upon noticing strange tracks, members of the community discovered that the missing people were victims of a shape-shifting monster who lured people to the waterhole with ‘sugarbag’ (honey), then dragged them under the water to their deaths. In the New South Wales story, the monster was female, but in the Western Australia story, it was male. In both stories, a clever man (Wirrigan in New South Wales and Jubertum in Western Australia) made a strong cord using the hair of women from the community. Upon reaching the waterhole, the clever man was offered a leg of kangaroo by the monster. The man told the monster, who appeared in the form of an Aboriginal man, that he wanted to take a nap first. The monster agreed and decided to nap as well. The clever man awoke, tied the cord to the sleeping monster, and jumped on its back. The monster woke and fought to remove the man from its back, diving into the water, turning it into the “hot soda water it is today”. The man repeatedly stabbed the monster with a spear but it would not die. The monster flew into the sky with the man on his back, where they are seen today as meteors. The only difference between the stories is the name of the clever man and the gender of the monster. Additionally, in the New South Wales story, the clever man fell to Earth with a group of falling stars at Girilambone, New South Wales. The rest of the story is exactly the same, suggesting one story originated from the other. The account from the Kimberleys was recorded in the literature 46 years earlier than the New South Wales account, though it is unclear where the story was developed first. The Kimberleys story was published in a magazine ‘for the Aboriginal people of New South Wales’, suggesting it may have been adopted by the Weilan in that state. Given the nearly identical wording and theme of the text, we do not consider these to be independent stories.

7 Meteors and Evil Magic

Mushrooms, Meteors and Magic: According to the Arunta of the Central Desert, falling stars contained an evil magic called *Arungquilta*. Mushrooms and toadstools were believed to be fallen stars endowed with this magic. As such, they were considered taboo and their consumption was forbidden (Spencer & Gillen, 1899, p. 566; 1904, p. 627; 1927, pp. 415–417). Although this taboo was not shared by other Aboriginal groups of the Central Desert (Kalotas, 1996, p. 1), it may have stemmed from bad experiences resulting from the consumption of poisonous or hallucinogenic mushrooms common to the area, such as *Amanita phalloide*, *Paxillus involutus*, or *Psilocybe subaeruginosa*. The association of mushrooms with fallen stars is not unique to the Arunta, but is found across the globe (see Beech, 1986).²

²See also *WGN* 21:4 (1993), pp. 200–202; 21:4 (1993), p. 225; 22:2 (1994), p. 28; & 35:1 (2007), pp. 23–28 for other non-Australian examples — Project Coordinators.



Figure 1 – Namorrorddo was a malevolent spirit that manifested itself as a fiery meteor. His long claws were used to grab the souls of people and hearts of children, after which he sped across the sky as a meteor. Bark painting ‘Figure with long fingers’ (1960) by Arnheim Land artist Samuel Manggudja (1909–1983). Reproduced with permission, courtesy of Anthony Wallis. ©Aboriginal Artists Agency, 2009.

Protection from Evil Magic: Aboriginal peoples employed various methods to protect themselves against the evil of meteors, including throwing firesticks in the direction of the meteor’s trajectory (Stanbridge, 1857, p. 140), or chanting and causing noise (Roth, 1984, p. 8). When a group of children from the Ooldea Region of western South Australia saw a meteor (which they called a *devil-devil*) they chanted *Kandanga darurarungu manangga gilbanga*, which roughly translates as ‘star falling at night-time go back’ (Harney & Elkin, 1949, p. 130; Berndt & Berndt, 1943/44, p. 53). A spirit called *Munpani* lived in the bush and was constantly watching over the Mara people, protecting them from the evil *Minungara* (Spencer & Gillen, 1927, p. 628). To prevent Namorrorddo from stealing the hearts of babies, they slept on their stomachs or sides when in the bush (Lewis, 2007, p. 2). If a Worora, Ngarinyin or Wunambal person saw a meteor while holding a baby, the person would kiss the baby on the forehead so the meteor-spirit would not see the infant as it flew overhead (Blundell & Woolagoodja, 2005, pp. 41–42). Aboriginal peoples of the Western Desert believed an evil sky-being named *Wuuna* would throw spears, seen as meteors, through the sky as he wandered across the heavens (Tindale, 1983, pp. 376–377). Because *Wuuna* hunted dingoes, epidemics spreading amongst the dogs were often blamed on the evil of *Wuuna*. The sight of a meteor would prompt the people to cover the animals in red ochre for protection (ibid). A special ceremony protected Tiwi initiates from the evil meteor spirit *Mabinua* (Spencer, 1928, p. 671), while only a medicine man could kill the Namorrorddo of Kuninjku lore (Lewis, 2007, p. 3). Similarly, a ceremony involving birth and circumcision wounds was used to protect Wardaman people against various forms of evil. This ceremony was connected to the Southern Cross and *Wuja*, the Wardaman word for meteors (Cairns & Harney, 2003, p. 65).

8 Meteors as Omens

Omens of Sickness and Death: The connection between meteors and evil spirits that hunted for the sick and the dead may account for the belief that meteors served as omens of sickness or death, a belief shared with the Tanganekald of South Australia (Tindale, undated), Aboriginal groups near the Bloomfield River,

Queensland (Roth, 1984, p. 8), the Turrbal of Brisbane (Howitt, 1996, p. 429), Yir-Yoront (Sharp, 1934/35, p. 34), Lardil (Roughsey, 1972, p. 107), Kaurna of Adelaide (Schurmann, 1987, p. 242), and Kukatja of Western Australia (Poirier, 2005, p. 171). The Ngarrindjeri told of a being named *Kulda* who would manifest as a meteor emerging from the Southern Cross, warning the people of a disease epidemic. This led the people to shout *peika baki* meaning “death is coming” (Tindale, 1934, p. 232; Tindale, 1983, p. 375; Parker et al, 2007, p. 400). Aboriginal people of Cape York Peninsula shared a similar view (Thompson, 1933, p. 498). Tindale (1937, pp. 111–112) recorded a ‘Fear Death’ song associated with the appearance of *Kulda*, and the smallpox epidemic that followed. The meteor, supposedly a fireball as it was very bright and ‘flashed’ across the sky, came from the east and shot westwards towards Kangaroo Island, known by Aboriginal people of the Coorong as the ‘home of the dead’ (ibid).

Positive Omens: Omens associated with meteors were not always negative. In one incident, an elderly Kukatja woman fell ill and was driven to a clinic. Along the way, a bright meteor flashed across the sky. The woman’s daughters-in-law saw it as a bad omen, and feared the worst. However, when the elderly woman began to recover, they instead viewed the meteor as a good omen (Poirier, 2005, p. 171). The Darkinung of New South Wales claimed meteors were a portent that something good was about to happen (Needham, 1981, p. 11). In Lardil culture, colored meteors were identified with sickness, while white meteors were seen as a sign of good luck, such as the arrival of a baby, or the finding of turtle eggs (McNight, 2005, p. 209).

9 Meteors and War

1 Portents of War: The association of meteors with omens of war was prevalent in various parts of eastern Australia, especially Queensland. In 1846, four survivors of a ship named ‘Peruvian’ crashed into the Great Barrier Reef. The survivors escaped to the shore of Cleveland Bay, near Townsville, where they wandered for two weeks before being discovered and fed by a band of local Aboriginal people. The Aboriginal people said they had been led to the place by following the paths of falling stars night after night, which foretold of the presence of a hostile enemy (Morrill, 1864, p. 16; Robertson,

1928, p. 144). The morning following the sight of a fiery meteor, Aboriginal men of the Tully River, Queensland would walk in the direction of the meteor's path to search for tracks left by possible enemies (Roth, 1984, p. 8), while Aboriginal people of Proserpine, Queensland saw meteors as killed enemies (ibid). The Ngarigo of southeast New South Wales believed that a bolide was a portent that showed the people where its path pointed, were gathering for war (Howitt, 1996, p. 430; Pring, 2002, pp. 27–28).

Implements of War: The link between meteors and war, including weapons of war, such as a spear or club, was found among several Aboriginal groups (e.g. Gibbs, 1996, p. 69). The Wathi-Wathi of the Murray River saw a meteor as the celestial passage of a *nullanulla*, a short spear-like weapon used to hunt the emu (Cameron, 1885, p. 365). Some Aboriginal groups in Queensland saw meteors as firesticks that were carried across the sky or thrown from the sky by their enemies (Roth, 1984, p. 8). The Turrbal (or Jagara) of the Brisbane region saw a meteor as a medicine man, called Kundri, dropping his firestick to kill (Howitt, 1996, p. 430), while Aboriginal people of the Western Desert believed Wuuna would throw showers of spears (meteors) from the sky. Images of Namorrorddo sometimes showed him carrying a *miyarrul* (fighting club) used to stun his victims (e.g. Blawasi, 1994). The Yarrungkanyi and Warlpiri people of the Northern Territory told how Dreaming men fell to the Earth as shooting stars, bringing the Dreaming to the people. The men, armed with weapons, travelled through the sky as falling stars and landed at a place called Purparlarla, southwest of Yuendumu, Northern Territory (Warlukurangu Artists, 1987, p. 127).

10 Meteors in Ritual and Ceremony

Causing Harm or Death: There existed a number of rituals in various Aboriginal cultures that served to harm people, often involving pointing a bone or stick at a person or enemy while chanting or singing a particular song, which caused the victim to become sick and die (Hollenback, 1996, pp. 208–210). Because meteors were frequently linked with sickness and death, they were often incorporated into these rituals. In the Lardil culture, the bone-pointing ritual was called *puripuri* (Roughsey, 1971, p. 75) and involved the spirit of a shooting star magically entering the victim like a bullet, inciting a dream. In his dream, the victim would see the ceremony being performed, and realize it was directed at him. This would cause the victim great worry and distress, feeling as if there was something in his chest or stomach, and his health would deteriorate until he died. During the ritual, people of the Star Totems (Ngarridbelangee and Bungarinyee) stayed awake at night chanting the name of the victim. If a meteor was seen, they knew the ritual was a success and the person had died. It was reported that the only cure for this act was to go to the man the victim saw in his dream and ask him to perform a ceremony to remove the shooting star from his chest.

Treating Sickness: Various rituals were utilized by the Lardil to treat an evil sickness called *Malgri* (probably a type of food-poisoning). One such ritual involved the treatment of a man who became sick after helping to catch fish near a beach, by a group of medicine men. The man likely had eaten unprepared palm nuts, which are poisonous when raw. At night, the medicine men made a long cord from human hair, tied it to the man's toe and trailed it out to sea. As the men chanted, when a meteor shot across the sky, this signified the *Malgri* had left his body, and returned to the sea. At the same moment, the cord was snapped, and the man began to groan and roll about (Roughsey, 1971, p. 80; Cawte, 1974, p. 110). If a meteor was seen from a Lardil camp where a person suffered from sickness, the people in the camp gathered bushes of Wattle leaves. To banish the sickness, they repeatedly warmed the leaves over a fire, then transferred the heat from the leaves to the sick person's abdomen, whilst chanting a song. When another bright meteor of red or blue color was seen, firesticks were thrown in the direction of the meteor. The Lardil believed the meteor was the evil of Thuwathu leaving the body and returning to the sea. If this did not happen, the sick person would probably die (Roughsey, 1972, p. 107).

Warning to Follow Laws and Traditions: Other forms of ritual that included reference to meteors involved warnings to follow laws and traditions. Examples of this were found across central and northern Australia, from Alice Springs, to Arnhem Land, to the Gulf of Carpentaria. For example, if a Lardil man were to break traditional laws, Thuwathu would afflict him with *Malgri* (Roughsey, 1971, p. 80), while a Wardaman deity, Utdjungon, would manifest as a fiery falling star and destroy the Earth (Harney & Elkin, 1949, pp. 29–31). According to Wardaman tradition, only Aboriginal people could ward off the threat of Utdjungon (ibid). Harney and Elkin interpreted this to mean that if no Aboriginal people were present to ward off Utdjungon, the colonists would be destroyed by the falling star. Therefore, the Wardaman felt it was in the best interest of the colonists not to force Aboriginal people from their lands or destroy their laws and traditions, as the consequences of their absence would be fatal.

In some cases, the casting of a star from the sky to punish lawbreakers was more literal. Harney (1969, p. 37) described an incident where a married woman ran away with her lover. Enraged, her husband sang a sacred song inciting magic, and slung a stone (which represented a sky-stone) at her using a hair-belt. The stone flew over her head, frightening her. Sobbing, she ran back to her husband who gave her a second chance. This was a practical example of the Utdjungon story, showing the application of the warning. Harney cited a similar account from Arnhem Land, where a fireball was slung at unfaithful women by a spirit-being who lurked in the Coal Sack, the dark nebula bordering the Southern Cross in the Milky Way (Coon, 1972, p. 294). Similarly, the western and southwestern Arunta of central Australia had rituals involving meteors and sky-stones that were used to punish people for disobeying

laws and traditions. A small spear-like device was used in a particular magic ceremony to punish a man for stealing another man's wife (Spencer & Gillen, 1899, p. 550; 1904, p. 627; 1927, pp. 415–417). The spear, endowed with evil magic, was hurled in the direction of the man's home. The evil spirit within the spear would locate the law-breaker and kill him. The men conducting the ceremony would wait until a thunderous boom was heard, which signified that the spear had struck and killed the man, though it is not clear whether this sound indicated the passage of a bolide. This form of Arungquilta was seen "streaking across the sky like a ball of fire" (ibid 1927, pp. 415–417).

Spencer and Gillen (1899, p. 550; 1904, pp. 627–628; 1927, pp. 415–417) described another form of Arungquilta, which involved meteors and produced comets, that was used to punish unfaithful wives. A particular ceremony was performed to punish a woman who had run away from her husband. A pictogram was drawn in the dirt in a secluded area while the men chanted a particular song. A piece of bark, representing the woman's spirit, was impaled with a series of small spears and flung in the direction they believed the woman to be, which would appear in the sky as a comet. The Arungquilta would find the woman and deprive her of her fat. After a time, the emaciated woman would die. Her spirit then appeared in the sky as a meteor.

The Kaitish believed that a falling star indicated the location of a man that had killed another by magical means, using a pointing-stick or bone (Spencer & Gillen, 1904, pp. 627–628). When such a death occurred, friends of the murdered man would watch for falling stars. When one was seen, they would "settle to their own satisfaction where it reached the earth" (ibid). Armed with a *wailia-wailia* (a device made from the hair of the dead man), the son-in-law of the murdered man organized an avenging party and travelled to that spot and killed the murderer by spearing him. They left the corpse for the women to bury at the spot where the star fell. It is not clear if the women found the actual spot where a meteorite had fallen, or if they simply guessed or collectively agreed as to the location of where they believed it fell. Spencer and Gillen stated that the women could easily locate the spot, as the ground was soft. This description is ambiguous, and though the finding of such a meteorite is possible, it seems implausibly rare. See Hamacher & Norris (2010b) for further examples of Aboriginal meteorite beliefs.

Initiation Rituals and Medicine Men: There is a close association between medicine men and meteors in many Aboriginal cultures. Amongst the Aboriginal people of Sugarloaf Mountain, New South Wales, the tooth-rapping ceremony (part of an initiation ceremony) was conducted by a medicine man who came to the Earth from the Sky World as a fiery meteor, and was considered a benevolent and good person (Gunsen, 1974, p. 50). This may imply a meteor had to be seen before the ceremony began. Among the Anula, medicine men are hereditary in the *Yuntanara*, or Falling Star Totem (Spencer & Gillen, 1904, pp. 479 & 488). Many rituals involving meteors centred on the

disembowelment of the initiate and the symbolic replacement of his organs with those of a sky being, without harming him. Such rituals were found among several groups in Victoria, including the Jupagalk (Elkin, 1977, pp. 75–76), Mukjarawaint and Jajauring (ibid), Wotjobaluk (Smyth, 1878, p. 309; Massola, 1968, p. 116; Howitt, 1996, pp. 368–369), as well as the Euahlayi of New South Wales (Parker, 1905, p. 54; Elkin, 1977, p. 89), the Binbinga from the shores of the Gulf of Carpentaria (Howitt, 1996, pp. 114–115), and the Mara of Arnhem Land (Spencer & Gillen, 1904, p. 488; Elkin, 1977, p. 115). Sometimes, the removed entrails were believed to be replaced with sacred stones that provided the initiate with the magic he would need as a medicine man. These stones were typically identified as quartz crystals or australites (Cowan, 2001, p. 21). Aboriginal peoples of the Bloomfield River in Queensland believed these quartz-like crystals to be fallen stars (Roth, 1984, p. 8). For the Arunta, crystals were associated with divine properties and origins, believed to have fallen to Earth as 'solidified light' (Eliade, 1965, p. 25). In Wuradjeri lore, a spirit named Kurikuta came to the Earth in a crystal body at night as a fiery meteor (Berndt, 1974, p. 28). Among the Kokatha of South Australia, quartz crystals and australites, called *ma-banba*, were used by medicine men to cure afflictions (Berndt & Berndt, 1943/44, pp. 56–57).

11 Other Views of Meteors

Some perceptions of comets and meteors fall into none of the themes described above, and have no apparent cultural counterpart elsewhere. In north-east Tasmania, the Plangermairrener tell of Puggareetya, a mischievous woman who fought a snake in its earthly home, driving the ground up to form the surrounding landscape (Noonuccal, 1990, pp. 115–119). During the fight, the snake cast Puggareetya into the sky where she was held by the sky spirit Mienteina. Puggareetya continues to play her tricks on the sky deities, who become annoyed and occasionally throw Puggareetya across the sky, seen as a meteor. The Mara tell about the supernatural conception of a child from a pair of spirit children that were beckoned by a meteor (Harney & Elkin, 1949, pp. 35–36). In a similar vein, the Narangga and Kurna peoples in South Australia viewed meteors as orphans (Transactions of the Statistical Society, 1842; Moorhouse, 1843; Black 1920, p. 89; Parker et al., 2007, p. 400). In New South Wales, Peck (1925, p. 160) told how meteors were warnings that the red blooms of the Waratah flower were being stolen, while a Queensland story tells of Priepriggie, a highly regarded figure in his community, who was able to make the falling stars dance to his songs (Reed, 1999, pp. 88–89). To the Moporr (Dawson, 1881, p. 101) and Gundidjmarra (Parker et al, 2007, p. 400) of Victoria, meteors represented deformity, which tied closely with sickness. Perhaps one of the strangest descriptions of a meteor came from the Aboriginal people of the Loddon River in Victoria, who had a word for seeing a dog jump up and attempt to bite a falling star: *Bûrdi-dûrt* (Smyth, 1878, p. 205).

Some researchers have described woodcarvings of

meteors, but the references tend to be vague. Mathews (1896, p. 41) recounted an earlier description of an initiation site in New South Wales surrounded by tree carvings, including images of meteors. Brown (2000, p. 27) claimed that in northwest and central Australia, marks and notches in wooden *churungas* depicted astronomical objects such as the flights of meteors and comets, but gave no examples and cited no references.

12 Meteor Showers

In 1939, an Amangu man from Mullewa, Western Australia told Tindale (1983, p. 376) that his paternal grandmother was a baby when ‘the stars fell’, alluding to a bright meteor shower in the early 19th century. Tindale speculated that this may have been the great Leonid meteor shower of 1833 November 13, an event where thousands of bright meteors lit up the sky every minute (cf. Littmann, 1999).

13 Conclusion

We have presented a comprehensive analysis of 150 Aboriginal Australian views of meteors, representing 97 Aboriginal groups from all states of Australia. Many of these views fell into particular themes, most notably fear, death, omens, and war. Many descriptions of meteors were included in ritual and ceremony, and focused on inciting harm to others, or providing protection from harm. However, not all views of meteors were negative. Of the accounts with a specific aspect, 38 (25%) described positive attributes, such as benevolent spirits or good omens, and 63 (42%) negative attributes, including evil spirits, evil magic, bad omens, weapons of war, deformity, or rituals causing harm. The remaining 49 stories (33%) described neutral attributes, such as the role of meteors in initiation ceremonies, definitions of meteors, or views of meteors that were considered neither good nor bad.

Many of these views were shared by Aboriginal groups across Australia. Although researcher bias has certainly played a role in how the accounts were recorded, there is little evidence to suggest this was the primary reason for these similarities. While circumstantial evidence exists to support the hypothesis that cosmic impacts may have caused a general fear of meteors, no physical evidence to confirm this has been found to date, as examined by Hamacher & Norris (2010b), and such events are so rare they are unlikely to have had any cultural effect even during the $\sim 40\,000$ years humans have inhabited Australia. The most probable explanation is that unexpected and random celestial phenomena were fearful because they disrupted an apparently ordered and predictable cosmos.

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