

## DREAMING THE STARS

### *Aboriginal astronomy and the southern sky*

#### INTRODUCTION

The Australian Aborigines were arguably the world's first astronomers. Their complex systems of knowledge and beliefs about the heavenly bodies have evolved as an integral part of a culture that has been handed down through song, dance and ritual for some 40,000 years, predating by many millennia those of the Babylonians, the ancient Greeks, the Chinese, the Indians and the Incas. More importantly for our understanding of their significance, Aboriginal beliefs survived, until very recently, within a virtually unchanged cultural context. It is impossible for us to understand what hunter-gatherer Europeans thought when they looked up at the northern constellations some 15,000 years ago, for we have no access to the body of knowledge that provided context for their ideas about the stars. Even the beliefs and legends associated with Babylonian, Greek and Roman astronomy have come to us only as isolated stories, divorced from the culture of which they were an integral part. However, from the nineteenth- and early twentieth-century accounts of Aboriginal culture we know that their star legends were located within a holistic social value system which both developed from, and accounted for, the brilliant nightly spectacle of the southern sky, the daily rebirth of the Sun and the phases of the Moon.

Astronomy, in the sense of a comprehensive and coherent body of knowledge about the stars, was an integral component of Aboriginal culture. Like the Newtonian-based system of Western science, it represented an attempt to construct a view of the Universe as an ordered and unified system, but in most ways it was fundamentally different. It was relational rather than mathematically-based, and it was concerned with similarity rather than with difference, with synthesis rather than analysis, with symbiosis rather than separation. It is significant, in this regard, that the Aborigines had no myth of alienation from Nature, such as the expulsion from Eden of the Judaeo-Christian tradition. On the contrary they believed that through their Great Ancestors they, too, were continuing co-creators of the natural world.

For the Aborigines, the stars not only evoked wonder; they also predicted

and explained natural occurrences and provided celestial parallels with tribal experiences and behavioural codes. Their beliefs show us, as no other existing culture can, how natural phenomena were assimilated and understood without recourse to the objective measurement of time, distance or quantity. In the process, Aboriginal astronomy also lends support for the view of many anthropologists that the findings of Western science are not culture-free knowledge, which is universally and necessarily true, but rather the product of particular assumptions inherent in a technological culture.<sup>1</sup>

#### OBSERVATIONS

The Aborigines' knowledge of the 'crowded' southern sky was probably the most comprehensive possible for people dependent on the naked eye. They made accurate observations, not only of first- and second-order stars, but even of the more inconspicuous fourth-magnitude stars, and in so doing devised a complex seasonal calendar based on the position of the constellations in the sky. Pattern was apparently more important in recognition than brightness, for the Aborigines often identified a small cluster of relatively obscure stars while ignoring more conspicuous single stars. Members of the Boorong tribe of the Mallee district of Victoria limited their identification procedures to linear patterns of three or more stars. Unlike the familiar Greek designations, based on a join-the-dot pictorial image, the Aborigines identified a group of stars with the whole cast of characters in a story, the relationship being conceptual rather than visual.

Colour was also an important factor in the Aboriginal designation of stars. The Aranda tribes of Central Australia, for example, distinguish red stars from white, blue and yellow stars. They classify the bright star Antares (Alpha Scorpii) as *tataka indora* (very red) while the stars of the V-shaped Hyades cluster, which represent for them two rows of girls, are divided into a *tataka* (red) group and a *tjilkeru* (white) group. The former are said to be the daughters of the conspicuously red star Aldebaran (Alpha Tauri).<sup>2</sup>

The Aborigines also differentiated between the nightly movement of the stars from east to west and the more gradual annual shift of the constellations. From this latter displacement they devised a complex seasonal calendar based on the location of constellations in the sky, particularly at sunrise or sunset. Anthropologists have recorded that the Aranda and Luritja tribes around Hermannsburg in Central Australia could predict the position of the constellation they named *Iritjinga* the Eagle-hawk (a quadrangular arrangement comprising Gamma and Delta Crucis and Gamma and Delta Centauri) with great accuracy throughout the whole annual cycle.<sup>3</sup> These tribes also knew that certain stars lying to the south, namely *Iritjinga* and the Pointers of the Southern Cross, are visible throughout the year, although their position in the sky varies. This amounts to a realisation that stars within a certain distance of the south celestial pole never fall below the horizon.

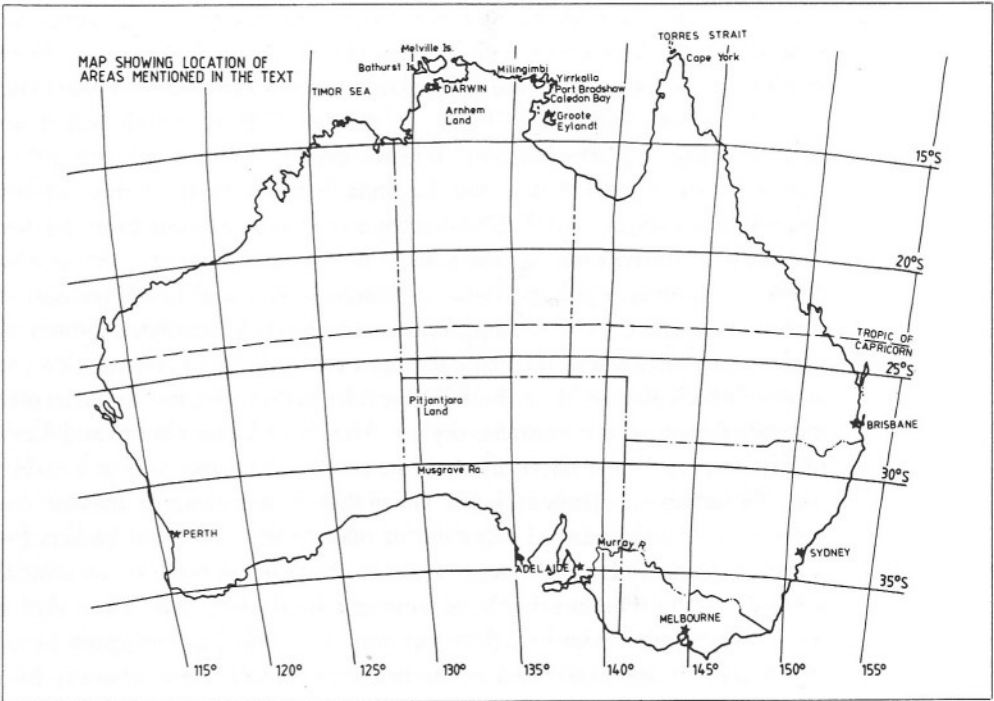


FIG. 1.1. Locations referred to in the discussion on Aboriginal astronomy.

Yet what the Aborigines did with their astronomical knowledge, and the reasons why they cultivated it, were essentially different from the structure and motivation of Western science and thus provide an interesting contrast with what we think of as a self-evident methodology. In the first place, traditional Aboriginal culture paid no attention to two of the most basic concepts of Western science, numeracy and temporality. The Aborigines made no measurements of space or time, nor did they engage in even the most elementary mathematical calculations. Fundamentally they observed the stars not out of scientific curiosity, or out of an interest in the stars for their own sake, but for essentially pragmatic reasons. Either they attempted to discover predictive correlations between the position of the stars and other natural events important to the survival of the tribe – the availability of particular foods or the onset of particular weather conditions – or they derived a system of moral guidance and education in tribal lore, a function equally necessary to preserve the tribe's identity.

#### THE PREDICTIVE FUNCTION OF ABORIGINAL ASTRONOMY

As hunter-gatherers, dependent for their survival on a foreknowledge of environmental changes, the Aborigines noted, in particular, the correlation

between the movements and patterns of stars and changes in the weather or other events related to the seasonal supply of food. As might be expected, the significance attributed to these sidereal occurrences varied with the diet and lifestyle of different tribes. Thus, on Groote Eylandt, in the north of Australia (Fig. 1.1), the appearance in the evening sky towards the end of April of two stars (Upsilon and Lambda Scorpii) in the 'sting' of the constellation of Scorpio indicated that the wet season had ended and that the dry south-easterly wind or *marimariga* would begin to blow. At nearby Yirrkala, however, the importance of Scorpio was linked to the realisation that its appearance in the morning sky in early December heralded the arrival of the Malay fishermen who came in their canoes to collect trepang or *bêche de mer*, which they sold to the Chinese.<sup>4</sup> In winter, the most spectacular individual stars in the southern sky are Arcturus (Alpha Bootis) and Vega (Alpha Lyrae). When Arcturus could be seen in the eastern sky at sunrise, the Aborigines of Arnhem Land knew that it was time to harvest the spike-rush or *rakia*, a reed valuable for making fish traps and baskets for carrying food, and a local legend about Arcturus served as an annual reminder of this. On the other hand, amongst the *Boorong* tribe of the Mallee district of western Victoria, Arcturus was personified as the spirit being *Marpeankurrk* and celebrated as the one who showed them where to find *bittur*, the pupa of the wood ant, a staple item of diet during August and September. Other notable events, like the ripening of tubers and bulbs and the appearance of migratory birds and animals, were correlated with specific positions of Orion, the Pleiades and the Southern Cross at different seasons of the year. For the *Pitjantjatjara* tribe in the Western Desert region, the appearance of the Pleiades in the dawn sky in autumn was particularly important as the sign that the annual dingo-breeding season had begun. Fertility ceremonies were then performed for the dingoes, or native dogs, and some weeks later the tribe raided the lairs, culling and feasting on the young pups.<sup>5</sup> Such stories clearly evolved to ensure that these nutritional associations were not forgotten and to stress their importance for the continuing survival of the race.

#### MYTH AND MORALITY

No less important to the preservation of the tribe was its sense of identity. This involved the tribal beliefs that were orally transmitted from generation to generation, outlining the place of the ancestors in the scheme of the Universe and the behaviour appropriate to their descendants. These myths were essentially metaphors, which integrated the strange and the frightening by relating them to the familiar. Explanations that emphasised pattern, order and laws, rather than unpredictable effects, reinforced the sense of the organic relationship believed to exist between natural phenomena and social behaviour. Since many of the legends involved the constellations, the night

sky served as a periodic reminder of the moral lessons enshrined in the myths. Like the stained-glass windows of medieval cathedrals, it provided, in effect, an illustrated textbook of morality and culture, relaying the accumulated wisdom of the tribe.

In common with most explanatory systems, including Western science, these legends represented attempts to understand, predict and hence to obtain some control over the natural world. However, unlike scientific method that is essentially analytical, materialistic and particularising, the underlying premise of all the Aboriginal myths concerning the Sun, Moon and constellations was a belief in the close spiritual unity of human beings, not only with other species, but also with inanimate objects. Astronomy was only a part of the Aborigines' total philosophy about the natural world, and the legends of the Dreaming<sup>6</sup> emphasised the parallels between the personified heavenly bodies and their earthly counterparts, humanising and integrating natural phenomena with tribal institutions and customs. Although anyone could observe the celestial bodies, the meaning that the tribe attributed to these observations was strictly conceptual rather than perceptual. It could not be understood by personal experience or by the intellect, but only through initiation into tribal lore that stressed the close causal association between physical events and the human dramas of good and evil. Lessons about compassion, brotherhood and respect for the land as Mother, the prohibition of incest and adultery, and taboos on killing or eating totemic animals were nightly reinforced by being enacted in the sky world. In many stories the subversive characters are rendered harmless by being translated into the heavens, where their recurrent appearance serves as a deterrent to others and hence as another means of safeguarding order. The following selection of these myths suggests something of the all-encompassing framework of which they are a part.

### *The Sun and Moon*

There are many Aboriginal variants of creation stories, but in most versions the life-giving force is associated with the Sun. Amongst the Murray River tribes the origin of the Sun is linked to the tossing of a giant emu egg into the sky where it struck a heap of dry wood and burst into flame, bringing light to the hitherto dark world. Thereupon, the Great Spirit *Baiame*, seeing how much the world was improved by sunlight, decided to rekindle the woodpile each day.<sup>7</sup> In contrast to the ancient Greeks, the American Indians and the Quechua Indians of Peru,<sup>8</sup> all of whom designated the Sun as male and the Moon as female, the Australian Aborigines represented the Sun as female and the Moon as male. In most areas, the Sun is regarded as a woman who daily awakes in her camp in the east and lights a fire to prepare the bark torch she will carry across the sky. This fire provides the first light of dawn. Before beginning her journey she decorates herself with powder made from crushed

red ochre, colouring the clouds red in the process. At evening, having travelled across the sky to the western edge of the world, she renews her powder, spilling red and yellow in the sky again, before beginning her long passage underground back to her camp in the east.

The Moon, being male, is generally accorded greater status, and in many areas powers of death and fertility are attributed to him. An eclipse of the Sun is interpreted as indicating that the Moon man is uniting with the Sun woman. In the legends of inland tribes, the Sun goddess fell in love with the Moon and pursued him across the sky. Although he was sometimes eclipsed, he always managed to escape from her but never permanently, for she instructed the spirits who hold up the edges of the sky to turn him back whenever he tried to slide down to Earth.

In addition, diverse legends have evolved to account for his waxing and waning. Aborigines in coastal areas noted the correlation between the phases of the Moon and the tides. At Yirrkala in Arnhem Land and on Groote Eylandt, when the Moon is new or full and sets at sunset or sunrise respectively, the tides are high; when the Moon is in the zenith at sunrise or sunset, the tides are low. The Aborigines believe that the high tides, running into the Moon as it sets into the sea, make it fat and round. (Although the new Moon may appear thin, they deduce from the faint outline of the full circle that it is really round and full of water.) Conversely, when the tides are low, the water pours from the full Moon into the sea below and the Moon consequently becomes thin (Fig. 1.2). In most areas the Moon was regarded as more mysterious, and hence more dangerous, than the Sun and thus functioned as a warning against immoral activities. Because of the association of the lunar cycle with the menstrual cycle, the Moon was linked with fertility, and young girls were warned against gazing at the Moon unless they wished to become pregnant.

### *The Milky Way*

The Milky Way, which spreads in a broad arc of diffused light across the southern sky, was commonly regarded by the Aborigines as a river in the Sky World<sup>9</sup> in which the large bright stars are fish and the smaller stars water-lily bulbs. The darkness and clarity of the night sky also allowed them to see clearly what northern hemisphere peoples could rarely glimpse, the dark regions that divide the southern Milky Way and, in particular, the dark region which Europeans first saw when they journeyed south and named the Coal Sack.

Various legends, many of them involving a moral lesson, have evolved in different areas to account for the formation of the Milky Way and the dark regions. Central Australian tribes believed that the Milky Way divided the sky people into two tribes and hence served as a perpetual reminder that a similar division of lands should be observed by local neighbouring tribes. In



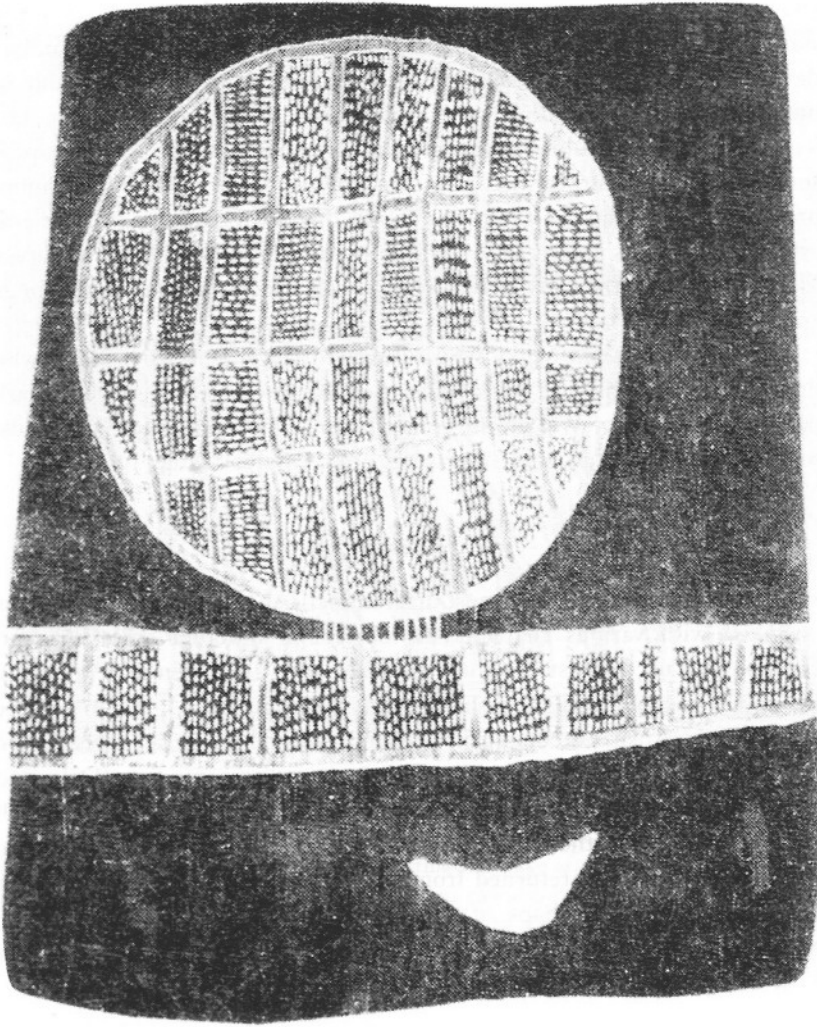


FIG. 1.2. Drawing of a bark painting from Groote Eylandt showing the full moon with lines on the lower edge indicating the water running into the moon from the sea (the horizontal band). The new moon is shown at the bottom as a crescent. Mountford Collection, State Library of South Australia.

the area around Port Bradshaw in north-east Arnhem Land, however, the Milky Way is associated with an act of adultery and subsequent vengeance, thereby conveniently employing a natural phenomenon as a recurrent warning against wrong-doing. Another version of the origin of the Milky Way, current in Queensland, identifies it with the deeds of *Priepriggie*, an Orpheus-like hero, as famed for his songs and dances as for his hunting. When he sang, the people danced to the rhythm until they dropped with

exhaustion, and declared that if *Priepriggie* wished he could make even the stars dance. One morning when he speared a flying fox, its companions descended upon him in vengeance, carrying him up to the sky. Unable to find him, his people decided to perform his dance, hoping for his return, but without him they could not capture the rhythm. Suddenly they heard a sound of singing in the sky. As the rhythm grew louder and more pronounced, the stars, hitherto randomly dispersed, began to dance and arrange themselves in time to *Priepriggie's* song. Thus the Milky Way serves as a reminder that the tribal hero should be celebrated with traditional songs and dancing.

Around Yirrkala, the Milky Way is linked to a legend of two brothers who drowned while fishing. Their bodies, floating in the water, are two dark patches in the Milky Way in the constellations of Serpens and Sagittarius, while their canoe is a line of four stars near Antares<sup>10</sup> (Fig. 1.3).

### *The Southern Cross*

Because of its conspicuous, almost diagrammatic shape, the Southern Cross is linked with various characteristic objects in different areas. Around Caledon Bay on the east coast of Arnhem Land, it is taken to represent a stingray being pursued by a shark – the Pointers (Fig. 1.4). On Groote Eylandt, where fish is the staple diet, the four stars of the Cross represent two brothers (Alpha and Beta Crucis) and their respective camp fires (Delta and Gamma Crucis) where they cook a great black fish (the Coal Sack), which they have caught in the Milky Way (Fig. 1.5). The Pointers are their two friends who have just returned from hunting. Desert tribes, on the other hand, see in the kite shape of the Southern Cross the footprint of the wedge-tailed eagle, while the pointers represent his throwing-stick and the Coal Sack his nest.

### *Venus*

The morning star was an important sign to the Aborigines who arose at early dawn to begin their hunting. It, too, was personified and frequently associated with death. In north-eastern Arnhem Land, a local legend suggests a realisation that the morning and the evening star are the same entity. *Barnumbir*, the morning star, lives on *Bralgu* the Island of the Dead, and is so afraid of drowning that she can be persuaded to light her friends across the sea at night only if she is held on a long string by two old women who pull her back to shore at dawn and keep her during the day in a basket. Tied by the string, she can never rise high in the sky and is seen most clearly at dawn and dusk when she is close to home. Because of the connection with *Bralgu*, the morning star ceremony is an important part of the ritual for the dead. *Barnumbir* is represented by a totem stick to the top of which is bound a



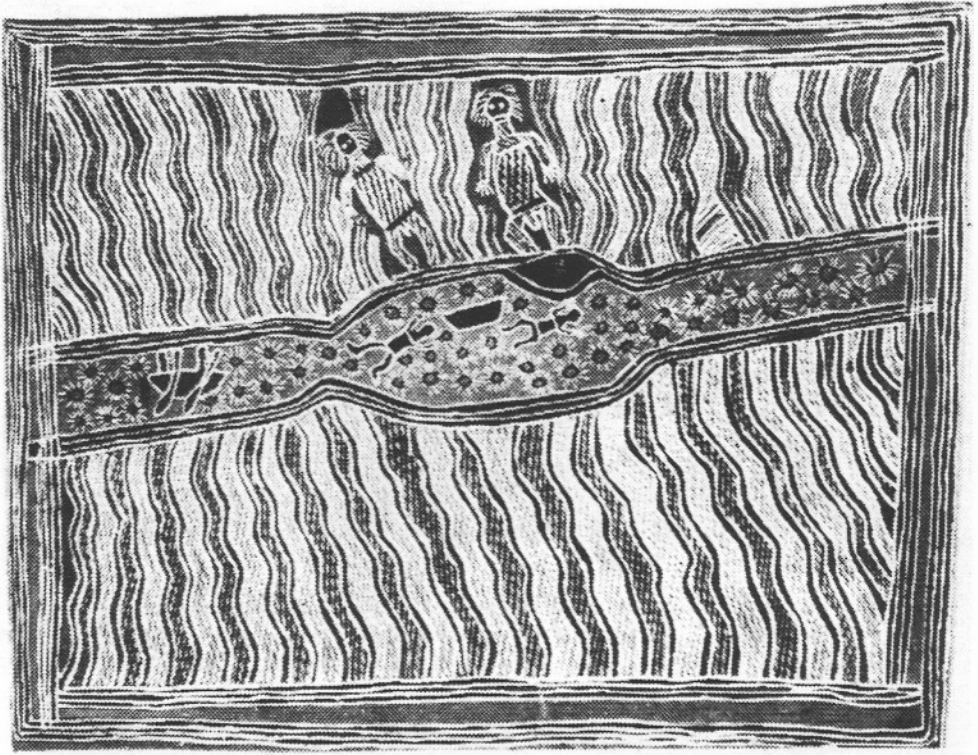


FIG. 1.3. From a Yirrkala bark painting of the Milky Way. The two brothers' bodies are the dark shapes in the central panel, while their canoe has turned into stars, surrounded by the rest of the stars in the Milky Way. The outer panels, depicting the wake of the canoe, represent wavy lines of stars in the Milky Way near Scorpio. The two brothers can also be seen in the upper panel, the elder one standing on a black rock that represents a dark part of the Milky Way near Theta Serpentis. Mountford Collection, State Library of South Australia.

cluster of white feathers, denoting the star, with long strings ending in smaller bunches of feathers to suggest the rays. When a person dies, his/her spirit is believed to be conducted by the star to *Bralgu*, its last resting place.<sup>11</sup>

#### *Orion and the Pleiades*

One of the most widespread myth cycles is that concerning the Pleiades. In Greek mythology, the Pleiades were the seven daughters of Atlas who, when pursued by Orion, begged to be delivered from the Hunter. Thereupon they were turned into doves and flew into the sky, where they formed the constellation named after them in Taurus. Aboriginal legends concerning the Pleiades bear a striking similarity to the Greek story. All identify them with a group of seven young women and nearly all portray the girls as fleeing from the unwanted amorous advances of a hunter who, in some versions, is

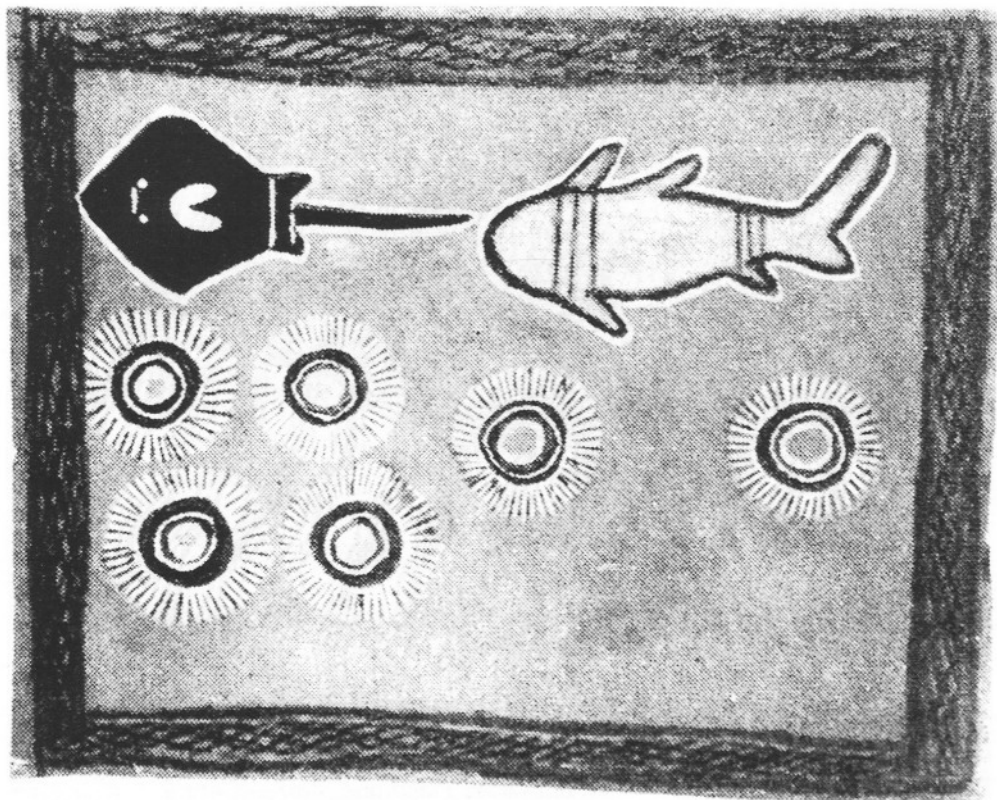


FIG. 1.4. Drawing of a bark painting from Yirrkala showing the stars of the Southern Cross (a stingray) being chased by the Pointers (a shark). Mountford Collection, State Library of South Australia.

castrated as a punishment and warning to other potential wrong-doers. The whole cluster of Pleiades stories forms part of a larger group of myths of sexual conquest and submission.

Amongst the *Pitjantjatjara* tribe, the practical connection noted above between the dingo-breeding season and the appearance of the Pleiades in the dawn sky in autumn is preserved in a local legend. According to this, the *Kungkarungkara* or ancestral women (sometimes called the Seven Sisters) kept a pack of dingoes to protect them from a hunter called *Njiru*. He succeeded in raping one of the girls who died (the obscure Pleiad), but, still not satisfied, he continued to pursue the others, armed with a spear that came to have ritual phallic significance. Eventually the women assumed their totemic form of birds and flew into the sky to escape from him, but, defying their dingoes, he followed them into the heavens where he can be seen in the stars of Orion's Belt.<sup>12</sup>

At Yirrkala on the coast of Arnhem Land, the motif of pursuit and rape is replaced by domestic harmony. There the constellation of Orion is said to be

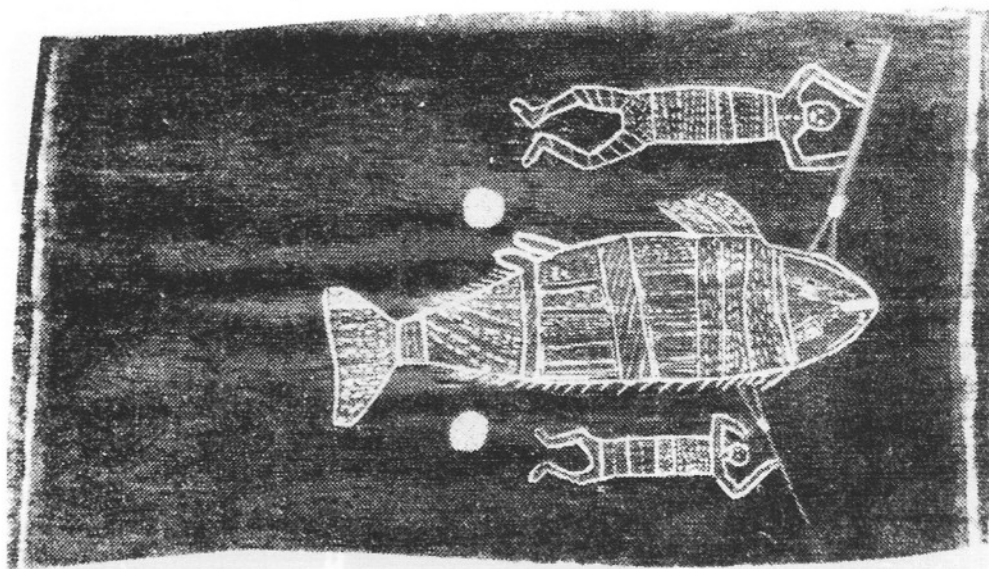


FIG. 1.5. Drawing of a bark painting of the Southern Cross from Groote Eylandt showing the two *Wanamoumitja* brothers spearing the fish (the Coal Sack). The two white circles are their cooking fires. Mountford Collection, State Library of South Australia.

a canoe full of fishermen while their wives, the Pleiades, are in another canoe, all having arrived from another land to the east. On their way the men caught a turtle and the women two large fish, but as they were nearing the shore a heavy storm capsized the canoes and drowned the people. The two canoes, the men and women, the turtle and the two fish (adjacent clusters of stars in the Milky Way) are all visible in the sky for the whole of the wet season (December to March) (Fig. 1.6). In its basic form this legend carries a warning against the dangers of fishing when storms are imminent, but in north-eastern Arnhem Land it carries the added moral message that the fishermen drowned as a punishment for catching catfish, forbidden to this tribe by totemic law.<sup>13</sup>

### *The Magellanic Clouds*

Although relatively insignificant, the Magellanic Clouds feature in many Aboriginal legends as the camps of sky people. On Groote Eylandt they are believed to be the camps of an old couple, the *Jukara*, grown too feeble to catch their own food. Other star people catch fish and lily bulbs for them in the Milky Way and bring them to the *Jukara* to cook on their fires. The Large Magellanic Cloud is the camp of the old man and the Small Cloud that of the woman. In the space between them a bright star called *Agnura*

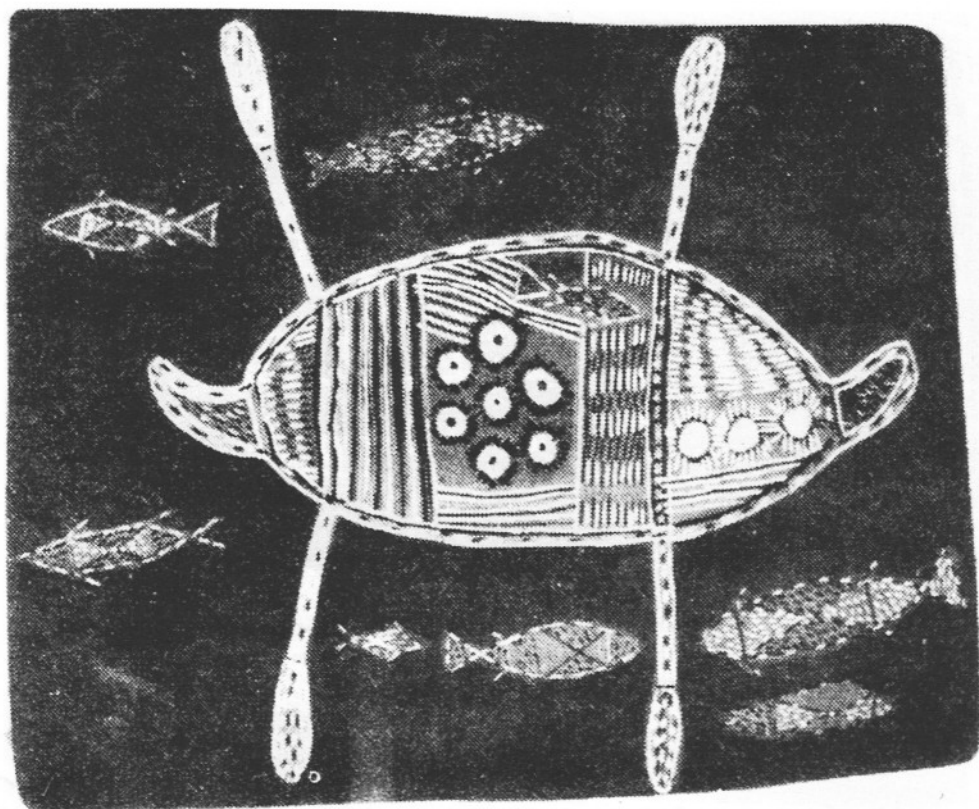


FIG. 1.6. Drawing of a bark painting representing the stars of Orion, the Pleiades and the Hyades. The three stars at the end of the canoe are Orion's Belt, the group of seven in the middle are the Pleiades, their wives. The paddles of the canoe are long lines of stars stretching out to north and south and including some from the constellations of Gemini and Eridanus. The fish in the canoe is the constellation Hyades and the fish in the water are stars in the Milky Way. Mountford Collection, State Library of South Australia.

(probably Achernar—Alpha Eridani, magnitude 0.49) represents their cooking fire (Fig. 1.7). This story suggests a celestial model of compassion for the aged.

#### DISCUSSION

From the sample of star legends described here, it will be apparent that the Aborigines were concerned not with extraordinary occurrences, but with the regular patterns of natural phenomena. This is understandable since one of the main functions of their mythology was to overcome the sense of helplessness otherwise inevitable in a people so completely dependent for their very survival on the natural world but largely without technological means of controlling their environment. The legends served this purpose by integrating a potentially alien Universe into the moral and social order of the tribe — by 'humanising' species and natural objects and ascribing to them

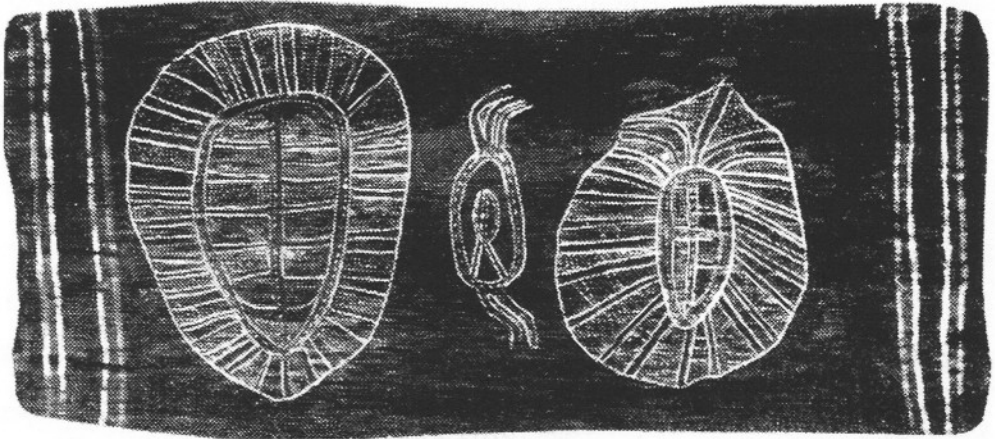


FIG. 1.7. Drawing of a bark painting from Groote Eylandt of the Magellanic Clouds. The large cloud at the left is the camp of the old *Jukara* man, and the one at the right, that of the old woman. Between them is their cooking fire, the star *Agnura*. Mountford Collection, State Library of South Australia.

behaviour patterns and motivations that accorded with those of the tribal unit.

Such a philosophy served a number of important social functions. In the first place it engendered a level of confidence about the place of human beings in the Universe, not as superior creatures but as equal partners; in this it fulfilled a role comparable to that of technology, which also offers a level of some control over the environment. Secondly, it cultivated respect for the inanimate as well as the animate, since all things partake of the same spiritual identity as human beings. Thirdly, the legends provided a justification for the customs, rites and morality of the tribe, as these were believed to be reflected and re-enacted in the sky-world.

The most radical difference between the vitalistic beliefs that underlie these myths and the materialistic philosophy of Western science concerns the relationship of the observer to the observed. Within the framework of Newtonian science, the observer is regarded as independent of, and distinct from, the object observed and this object, in turn, is uninfluenced by the observer. Hence, the relationship between physical objects can be validly expressed in mathematical terms that remain true irrespective of the observer. It was this rationale that induced Europeans to cross the globe to observe and measure the transit of Venus with the greatest possible accuracy. The Aborigines, on the other hand, did not conceive of themselves as observers separated from an objectified Nature, but rather as an integral part of that Nature. The meaning of the stars, as of everything else in the environment, was neither self-evident nor independent of the observer; rather it depended on the degree of initiation into tribal lore that elucidated the links between tribal customs and natural phenomena. Without this



knowledge the individual was disoriented and powerless in an alien Universe.

The arrival in *Terra Australis* in 1770 of European astronomers, imbued with a mathematical and reductionist understanding of the world, was to have an effect on this mythical framework no less radical than the impact of white society on the land and status of the Aborigines themselves.