2

The Dog Star

"The ancient Greeks have a knack of wrapping truths in myths"
—George Lloyd (1913–1998)

Among the brightest stars of the northern winter sky, Sirius is prominent as the principal star of the constellation Canis Major, Latin for the Greater Dog. Canis Major is located below and to the left of Orion, the Hunter. Above Canis Major is Canis Minor, the Lesser Dog (Figure 2.1). Both of these Dog-Constellations represent Orion's faithful hunting dogs and constant companions, who track and fetch his prey. Indeed, Canis Major, at the foot of Orion, is often envisioned as being poised, ready to spring towards the constellation of Lepus, the Hare. Canis Minor also contains its own prominent dog-star, Procyon, whose name in Greek literally means the one that goes before, or precedes, "the dog". This refers to the fact that Procyon is seen to rise approximately an hour before Sirius. Together, Sirius, Procyon, and Betelgeuse, the, brightest star in Orion, form the three stars of the "Winter Triangle". The well-known relations between Sirius, Canis Major, Canis Minor, and Orion are a familiar part of our sky-lore, much of which comes from early Greek sources. Indeed, Canis Major, Canis Minor, and Orion are among the 48 constellations recognized by the early Greeks. However, for Sirius the star, there existed a host of complex associations and beliefs, among the early Greeks and Romans and other cultures, which are both extensive and ancient.

The precise origin of the name Sirius itself is obscure, it is certainly not Arabic, like many of the most familiar stars in the sky, such as Vega and Deneb, nor is it strictly Greek, such as the stars Arcturus or Procyon. The early Greeks often simply referred to Sirius as the "the dog" or "the dog star". The name Sirius (Σείριος) first appears in the 7th century BC, in the poem *Works and Days* by Hesiod. Although the name Sirius may well be associated with the Greek word σείριος ("*sierios*"), meaning searing or burning, the ancient Greeks themselves were uncertain as to the source of

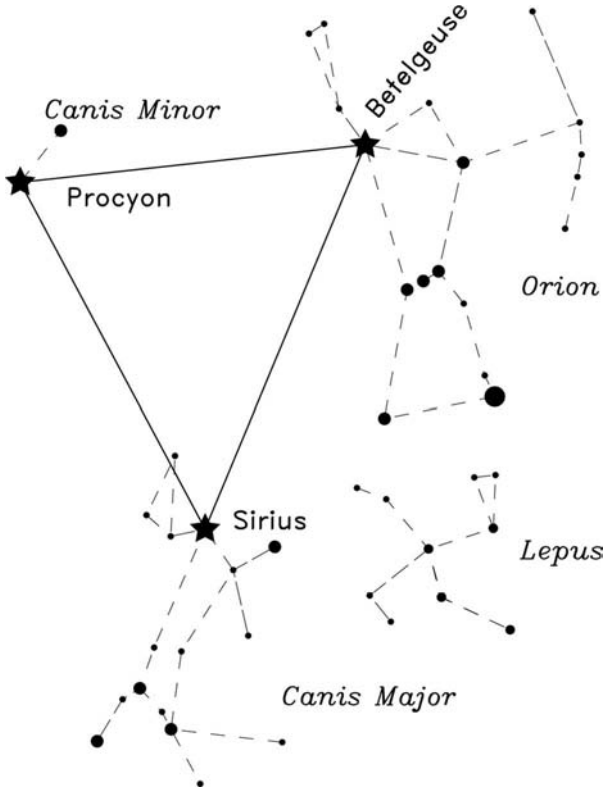

Figure 2.1. A view of the winter sky showing the relationship of the constellations Canis Major, Canis Minor, Lepus, and Orion together with the locations of Sirius and Procyon. The Winter Triangle (solid lines) consists of Sirius, Procyon, and Betelgeuse.

the name. It is very likely pre-Greek, possibly of Indo-European origin. This is suggested by the sacred Hindu texts, the Vedas, which originated in about 1500 BC, and refer to Sirius as *Tishiya* and by other variations that are also echoed in the ancient Iranian *Tiśhtrya*. If these names bear any linguistic relation to the word Sirius, then the origin of the name is indeed very old and its genesis is lost in the prehistoric movement of peoples of the Near East and eastern Mediterranean.

The Greeks possessed an elaborate lore associated with Sirius, quite distinct from that of the Egyptians. To the Greeks, the first appearance of Sirius in the morning skies during the final days of July and early August indicated the arrival of the sweltering heat of late summer. Specifically, in the Greek mind the star was also associated with heat, fire, and even fevers. There was also a strong association with dogs, and in some instances with the ominous presence of doom. The earliest recorded mention of Sirius is from the 8th century BC in Homer's epic poem of the Trojan War, the *Iliad*. Although Homer does not explicitly use the name Sirius, he employs all of the common Greek attributes of the star in three poetic metaphors describing the

combat of both Greek and Trojan heroes. As translated by Robert Fitzgerald, Homer describes the shining armor of the Greek warrior Diomedes, as the goddess Athena prepares him for battle, and likens it to the rising of Sirius, in book 5 of the *Iliad*:

> Now Diomêdês' hour for great action came.
> Athêna made him bold, and gave him ease
> to tower amid Argives, to win glory,
> and on his shield and helm she kindled fire
> most like midsummer's purest flaming star
> in heaven rising, bathed by the Ocean stream.
> So fiery she made his head and shoulders
> as she impelled him to the center where
> the greatest number fought.

In book 11, Homer uses a darker, more ominous, Sirius to describe the armor of the Trojan hero Hector and to foretell his fate:

> Hektor moved forward with his round-faced shield.
> As from night clouds a baleful summer star
> will blaze into the clear, then fade in cloud.
> So Hektor shone in front or became hidden
> when he harangued the rear ranks—his whole form
> in bronze aflash like lightning of Father Zeus.

Perhaps the most famous description occurs later in book 22, when Homer again uses Sirius to describe the glittering armor of the Greek champion, Achilles, as he prepares for his decisive battle with Hector before the walls of Troy:

> And aging Priam was the first to see him
> sparkling on the plain, bright as that star
> in autumn rising, whose unclouded rays
> shine out amid a throng of stars at dusk—
> the one they call Oríôn's dog, most brilliant,
> yes, but baleful as a sign: it brings
> great fever to frail men. So pure and bright
> the bronze gear blazed upon him as he ran.

In all of these passages Homer deftly uses the brilliance of Sirius as a metaphor to describe the appearance of polished Bronze Age armor. However, these lines also allude to several themes that continually reappear over the next thousand years in Greek and then Roman literature, which reveal popular ideas and beliefs concerning Sirius. The first is the association of Sirius' "flaming" brightness with fire and its annual appearance in the dawn sky, marking the arrival of late summer. The second is

clearly different, Sirius is a "death star" used by Homer to convey the fate of doomed Hector in his battle with Achilles. The third reference again describes the appearance of Bronze Age armor, this time that of the victorious Achilles. But to this is added the association of Sirius with dogs, and fever and again as a sign betiding woe. The scene Homer paints of the stars of Orion rising in the night skies of autumn, followed by Sirius, would have been intimately familiar to the Greeks as a seasonal marker. The allusion to dogs is straightforward: Sirius is the chief star of the constellation Canis Major. Indeed, later Greeks, such as the astronomer Ptolemy, often used the simple term "the dog" (κύων) to refer to both the star Sirius and the constellation of Canis Major. The mention of fever, as we shall see, is another common Greek attribute of Sirius.

The *Iliad* was originally an epic poem arising from a long oral tradition. It was recited and acted out by untold generations of bards, poets, and storytellers, that long preceded Homer. Homer, who may never have existed as an individual, is traditionally credited with composing the existing versions of the *Iliad* and the *Odyssey*, shortly before 700 BC. The events described in the *Iliad*, to the extent that they have any historical basis at all, depict a decade long siege of the city of Troy by a Greek army, sometime around 1250 BC. Although, the historical facts surrounding the *Iliad* are murky, many of the principle cities, Troy, Mycenae, Tiryins, etc. have been discovered and the armaments and modes of battle described in the *Iliad* appear to be accurate, but none of the major characters have any sound historical counterparts.

The *Iliad* contains many astronomical allusions in addition to those concerning Sirius. The ancient bards, as well as their audiences, would have been as fully familiar with the appearance of the night sky as they were with the byways of their native village. To anyone who has experienced the extreme good fortune of viewing a moonless night sky, with dark-adapted eyes, in a location completely free from artificial lights, there is little doubt that the image of an inky blackness filled with literally thousands of stars constitutes an impressively dramatic spectacle that leaves a lasting impression. There is little perception of depth or distance, and the stars seem almost near enough to touch. To people in Homer's era, when cooking fires and oil lamps were the only artificial lighting, such a spectacle was a common nightly experience. Moreover, navigators, travelers, farmers, and herdsmen of that time were of necessity, first-hand experts on the stars, the constellations, and their movements. Such scenes, and much more detail, would have been intimately familiar to the Greeks of Homer's time.

Some seven centuries after, the Roman poet Virgil amplifies Homer's use of Sirius in his *Aeneid*, the Roman national epic. Virgil uses the imagery of a comet and Sirius to describe the helmet and shield of Aeneas: "... even as when in the clear night comets glow blood-red in the baneful wise; or even as fiery Sirius, that bearer of drought and pestilence to feeble mortals, rises and saddens the sky with baleful light."

Beginning with Homer and continuing on for the next thousand years, the Greeks, followed by the Romans, left an elaborate and complex set of ideas and beliefs regarding Sirius. Hesiod, a poet from Boeotia, an area of central Greece northwest of Athens, who also wrote in the time of Homer, spoke of the heat of late summer brought on by the arrival of Sirius. In his poem *Works and Days*, as translated

by Hugh Evelyn-White, Hesiod provides a distinctively rural, agricultural view of the seasons and the sky in the 8th century BC:

> But when the artichoke flowers, and the chirping grass-hopper sits in a tree and pours down his shrill song continually from under his wings in the season of wearisome heat, then goats are plumpest and wine sweetest; women are most wanton, but men are feeblest, because Sirius parches head and knees and the skin is dry through heat. But at that time let me have a shady rock and wine of Biblis, a clot of curds and milk of drained goats with the flesh of an heifer fed in the woods, that has never calved, and of firstling kids; then also let me drink bright wine, sitting in the shade, when my heart is satisfied with food, and so, turning my head to face the fresh Zephyr, from the everflowing spring which pours down unfouled thrice pour an offering of water, but make a fourth libation of wine.

Four hundred years later, the poet Aratus (c. 310 BC–260 BC) also provided a vivid account of the seasons and their relation to the constellations in his popular poem *Phaenomena*. In a much-quoted passage Aratus, as translated by Douglas Kidd, describes the rising of the constellation Orion followed by the dreaded appearance of Sirius:

> Such is also his guardian Dog, seen standing on its two legs below the soaring back of Orion, variegated, not bright overall, but dark in the region of the belly as it moves round; but the tip of its jaw is inset with a formidable star, that blazes most intensely: and so men call it the Scorcher. When Sirius rises with the sun trees can no longer outwit it by feebly putting forth leaves. For with its keen shafts it easily pierces their ranks, and strengthens some but destroys all the growth of others. We also hear of it at its setting. The other stars lying around about Sirius define the legs more faintly.
>
> Under the two feet of Orion the Hare is hunted constantly all the time: Sirius moves forever behind it as if in pursuit, rises after it and watches it as it sets.

Aratus here refers to the fact that as the constellation Canis Major rises in the eastern sky, below and to the left of Orion, at first only Sirius, among the stars of Canis Major, is visible near the horizon. The word variegated refers to the other stars in the constellation, not specifically to Sirius. As the Greeks delineated the constellation of Canis Major, Sirius variously defines the chin, the mouth, or the snout of the dog. The "Hare" is the constellation Lepus, the hare, located west of Canis Major and south of Orion. Both Hesiod and Aratus mention the heat of late summer that the Greeks believed was actually brought on by the appearance of Sirius. To Hesiod this is simply an enervating heat that is conducive to inactivity. Aratus, on the other hand, depicts Sirius as bringing a dangerous scorching heat that can sere and burn and in particular wilt certain crops. Over the centuries Greco-Roman writers returned to these themes again and again to describe the arrival of Sirius. Aratus' *Phaenomena* was extremely popular and Greek and later Roman writers frequently reworked and commented on his poem. Many of the oft-quoted references to the color, flaming

appearance, and vaguely "reddish" properties of Sirius have their origin in this tradition.

To the Greek mind there was a direct causal connection between the arrival of Sirius and the onset of the hot dry days of late summer. Sirius, as it emerged from its conjunction with the sun, was thought to induce the heat and dryness of August. This heat could not only wither plants but influence the behavior of animals as well. Goats would gaze towards Sirius in the east and emit a cry, the wild Egyptian oryx was said to turn towards Sirius and sneeze. People could contract deadly fevers at this time of year, brought on by Sirius; men could weaken during this time and women could be overcome by carnal desire. People, who suffered from the heat of Sirius were said to be "star struck" (*astrobóletus*). Even Hippocrates, the father of medicine, warned of the effects of Sirius.

Sirius was thought to produce "emanations" which could place people and animals in danger of these effects. The idea that Sirius was a source of these emanations could well be linked to the visual appearance of the star when the atmosphere is turbulent and unsettled. At these times the star appears alive and active; seemingly splashing colored rays of light into the sky. Because of its brightness and bluish-white color, Sirius displays such activity much more prominently than other stars and was therefore perceived to be capable of producing effects in humans, animals, plants, and the environment. There was also a widespread association in the Greek mind of the twinkling and flashing of Sirius with such physiological conditions and states as seething, shaking, emptying, and oppression: as if the star was in distress and spewing its light about the sky. Indeed, Sirius acquired such epitaphs as "the Shaker".

During the Hellenistic era the inhabitants of the small Greek Island of Ceos celebrated an important local festival. In late summer sacrifices were offered to the star Sirius and to Zeus to bring the cooling breezes that relieved the heat. There on hilltops of Ceos, the islanders, clad in their armor, would observe the heliacal rising of Sirius seeking signs or omens foretelling the possibility of epidemics during the coming year. If the star rose clear and brilliant, then the prospects for the health of Ceos' inhabitants were good. If the star appeared faint or misty, then its exhalations could prove pestilential. So important was Sirius to the citizens of Ceos that they imprinted their coins with an image of a star or a dog emanating spiked rays (Figure 2.2, see also color section).

The association of Sirius with dogs is far more elaborate than the simple fact the star resides in the constellation Canis Major. Dogs, of all animals, were thought most affected by the annual reappearance of Sirius. Dogs were believed to suffer at this time of year and their panting was an indication of internal desiccation and excessive dryness. When this occurred, dogs were in danger of becoming rabid and their saliva poisonous. Humans could then become rabid and die from a dog bite. The rapid panting of overheated dogs, with their outstretched tongues, was viewed by the Greeks as a sort of "gaping" behavior and was also associated with the "seething" and "shaking" nature of Sirius. In this fashion, Sirius was sometimes also referred to as "the Gaper".

It is this old association of Sirius with the heat of late summer and with dogs that is the origin of the seemingly enigmatic phrase "dog days" or "dog days of

Figure 2.2. A 3rd century BC coin from the Greek island of Ceos. The reverse (right) shows a dog surrounded by radiant rays (Sear 3079; courtesy of the Michael Molnar R. Collection).

summer". The phrase goes back to Roman times when this season was known as "dies caniculares", the "days of the dog-star", Canicula being the Latin name for Sirius. The "dog days" were generally considered to extend from early July to mid-August.

It was not only the heliacal rising of Sirius that provoked the interest of the Romans, the heliacal setting of Sirius, almost three months earlier, was also noted. Beginning in 238 BC and around the 25th of April each year, the festival of *Robigalia* was held in which white-robed priests would sacrifice a red dog. The point of the sacrifice was to entreat the goddess *Robigo* to protect the wheat crop from developing a rust-colored fungus that spoiled the grain. It was believed that the heliacal setting of Sirius around that time of the year was responsible for emanations that produced the wheat rust.

In other ancient references, Sirius was not seen as a domesticated dog but a canine having a ravenous wolf-like nature. Even as late as the 8th century AD Sirius was depicted in this way with bared fangs, a rampant posture, and shaggy mane (Figure 2.3, see also color section). The association of Sirius with wolves has some interesting and curious parallels, which extend well beyond Greece and Rome. The Greek poet Oppian in the late 2nd century AD wrote of a golden wolf that lived far to the east and haunted the hills of the Taurus Mountains, in what is now south–central Turkey. The golden wolf was a beautiful animal of exceptional prowess, whose teeth could pierce bronze. When Sirius rose, however, the golden wolf retreated to his underground lair until "the heat of the Sun and the baneful Dog Star cease." Sirius could easily intimidate and dominate the fierce golden wolf and force his retreat. Interestingly the Roman poet Manilius also writes of a people who, like those on the island of Ceos, observed the rising of Sirius in the east from the top of Mt. Taurus and sought omens as to the health of the crops and the populace and the prospects of peace and war.

Finally, although the Egyptians had no original tradition of associating Sirius with dogs, the influence of later Greek and Roman beliefs did have an impact. Just as Egyptian gods and funeral practices influenced the Greek and Roman cultures there also developed a set of cross-cultural beliefs associated with Sirius. During the reign of the Roman Antoninus Pius, from 138 to 161 AD, there was an interesting drachma

Figure 2.3. Sirius in the form of a rampant wolf-like dog, from the 9th century Codex Vossianus Latinus manuscript in Leiden (Reprinted with permission from *Sky & Telescope*, June 1992).

minted in Alexandria which showed the Egyptian goddess Isis riding on the back of a dog (Figure 2.4, see also color section).

In addition to Greek and Roman beliefs about dogs and Sirius, there exist many curious similarities with other cultures elsewhere. In China, Sirius is known as *Tsien Lang* or the Heavenly Wolf. The association with a wolf is intriguing considering the wide-spread association of the star with dogs and wolves in the West. It is not known if this is merely a coincidence or an indication of a very old tradition that spans the Eurasian continent. On the other hand, there do exist written cuneiform references to

Figure 2.4. An Alexandrian drachma from the reign of the Roman Emperor Antoninus Pius, showing a representation of the Egyptian goddess Isis astride the Greco-Roman canine representation of Sirius (Milne 2358; courtesy of the Michael R. Molnar Collection).

Sirius from ancient Mesopotamia which also allude to dogs. For example, the word *'Kak-shisha* has been translated variously as "the dog that leads" and "a Star of the South". Later Mesopotamian names include *Kal-bu*, "the dog" and *Kakab-lik-u*, "the star of the dog". The Phoenicians were said to have called it *Hannabeah*, "the Barker".

There are also numerous and intriguing associations of Sirius with dogs and wolves from throughout North America. To the Alaskan Inuit of the Bering Straits, Sirius is the "Moon Dog". When the moon comes near Sirius, high winds will follow. Among the Tohono O'odham of the southwestern deserts, Sirius is the dog that follows mountain sheep, a description that was shared with the Seri who lived to the south along the Gulf of California, in Mexico. To the Blackfoot of the northwestern Great Plains the star was "dog-face". Among the Cherokee, whose ancestral home was the central Appalachian Mountain region, Sirius and Antares are the dog stars that guard the ends of the "path of souls", the Milky Way. Sirius, in the winter sky, guards the eastern end, while Antares, in the summer sky, guards the western end. A departing soul must carry enough food to placate both dogs and pass beyond, or spend eternity wandering the "path of souls". Alternatively, the Pawnee of Nebraska have an elaborate and well-developed mythology tied to the heavens. The Skidi (or Wolf) band of the Pawnee called Sirius the "Wolf Star" and the "White Star". According to Skidi cosmology, Sirius brought death into the world and would escort deceased tribal members along the "spirit pathway" (the Milky Way) to the place of the dead in the south. During times of a sacrificial ceremony, a tribal representative of the White Star would sit in the southwest corner of the lodge to watch over the ill-fated sacrificial maiden. Among other Pawnee, Sirius was the Coyote Star, the trickster. The Northern Osage, of the south–central United States, regarded Sirius as the "Wolf that hangs by the side of Heaven".

This is not to say that Sirius was universally associated with dogs in ancient North America. On the contrary, there are many more tribal legends and associations that have nothing to do with dogs and wolves, but none of these have any identifiable common themes. Nevertheless, the numerous and widespread associations with dogs and wolves that do exist are curious. It is not inconceivable that some of this lore may well have crossed the Bering Straits with one or more groups of ancient people from northeastern Asia during the last Ice Age.

In North America, Sirius also served as a direction marker. In addition to being the Wolf Star of the Skidi Pawnee, Sirius was also revered as "The White Star", which was one of the four god stars that held up the sky. Traditional earth lodges were laid out according to these four stars, which occupied the semi-cardinal directions, with Sirius assigned the southwest lodge pole of the structure.

There have been other proposed alignments with Sirius in the Americas; however, none of these has stood up well to scrutiny. Perhaps the best known example is that of the "Medicine Wheel" in the Big Horn Mountains of Wyoming. In 1974 John Eddy, a scientist at the National Center of Atmospheric Research in Boulder, Colorado published an article in *Science* calling attention to supposed alignments of rock features within the wheel with celestial events such as the heliacal risings of bright stars such as Sirius, Aldebaran, and Rigel. Much of Eddy's evidence was undercut,

however, by the fact that he did not include the effects of atmospheric refraction (Appendix A) which serves to displace the points on the horizon where Sirius and other stars will appear. When refraction is included then the agreement is not as impressive as originally claimed by Eddy. The current consensus is that the alignments are certainly more coincidental than intentional. Another example comes from the ancient Mayas of Central America and the Yucatan, who were exceptionally keen observers of the heavens and built many temples and structures from which to observe the stars and the planets. They were most interested in the planet Venus and constructed a highly accurate calendar based on its heliacal rising. Possible alignments of Mayan temples with Sirius and other stars were investigated in the 1970s; however, with the exception of the temple at Monte Alban, which has a tentative alignment with Sirius, no striking coincidences were found.

Sirius also has an interesting involvement with the ancient constellation of the bow and arrow. The ancient Chinese recognized a constellation of stars forming a bow and an arrow. The bow and arrow resides to the south and east of Sirius and is formed from stars in the modern constellations of Pupis (the stern portion of the old constellation of Argo Navis) and Canis Major. In the Chinese constellation, the arrow is aimed directly at the Heavenly Wolf, Sirius. This is almost directly echoed by the ancient Mesopotamians who appear to have recognized the same constellation, with the exception that Sirius is included as the tip of the arrow. To the Babylonians Sirius was ^{mul} *KAK.SI.DI*, "the arrow-star". In later Persian culture, Sirius was known as *Tir* "the Arrow". As mentioned in the first chapter, the sky depicted on the ceiling of the Temple of Hathor at Dendera, Egypt shows the archer–goddess Satet with a drawn bow and an arrow pointed in the direction of Sirius/Hathor. Satet was also the goddess of the hunt, the inundation, and the waters, among other things.

After the ancient Egyptians and their elaborate beliefs surrounding Isis, the Zoroastrian faith, which began in Persia around 600 BC, had perhaps the greatest devotion to Sirius. To the Zoroastrians, *Tishtrya* was the angel of the star Sirius. Their holy book, the *Avesta*, contains a lengthy hymn, the *Tishtar Yasht*, devoted almost entirely to Tishtrya, where many of the verses began with the devotional expression, "We sacrifice unto Tishtrya, the bright and glorious star, who ..." To the Zoroastrians many of the attributes of Sirius are centered on the rains and waters. For example, "We sacrifice unto Tishtrya, the bright and glorious star, for whom long the standing waters, and the running spring-waters, the stream-waters, and the rain-waters ..." Another common theme is that of "a swift-flying and swift-moving arrow that flies to the sea". In ancient India Sirius was often associated with hunting. In Sanskrit its title was the "Deer-Slayer" and the "Hunter". The sacred Hindu texts, the Vedas, also refer to Sirius as *Tishtrya*, and variously as *Tishia*, *Tishiga*, or *Tistar*, "The Chieftain's Star".

In Arabic, Sirius is known as Al Shi'ra, which clearly resembles the Greek and other names of the star. In later Islamic astronomical texts Sirius is called Al Kalb Al Akbar, for the "Greater Dog", following earlier Greek practice. Sirius is mentioned in several places in the Quran, the only star to be explicitly identified, other than the sun. In chapter (surah) 50, called Al Najm (the star), the Quran recounts the attributes of Allah in verse 53 which states, "And he who is the Lord of Sirius". There is also surah

86 which speaks of the night visitor, *At-tariq*, which is the star of piercing brightness, and which some hold to be Sirius:

86.1 By the Sky and the Night-Visitant
86.2 And what will explain to thee what the Night-Visitant is?
86.3 (It is) the Star of piercing brightness.

In Africa, the Dogon tribe, in the modern nation of Mali, is claimed to possess a well-publicized and remarkable set of beliefs concerning Sirius. These beliefs and their possible origin are discussed in more detail in Chapter 11. In addition to these beliefs, the Dogon are said to have noted the heliacal rising of Sirius by the use of stone markers which they used to define the sight lines on the horizon to the points where Sirius will rise just before the sun. They are also said to have made use of a calendar based on Sirius along with solar and lunar calendars, in much the same fashion as the ancient Egyptians. References to these practices go back to the early 1930s, when Dogon customs and beliefs were first studied by the French anthropologist Marcel Griaule. Further mention of these Sirius-related astronomical connections and the "sirien" calendar is contained in the 1965 book *Le Renard pâle* written by Griaule and his colleague, Germaine Dieterlen. In 1998 Dieterlen, accompanied by the French astronomer J. M. Bonnet-Bidaud, revisited some of the sites mentioned by Griaule and conducted measurements of alignments of the markers which seemed to confirm that they could have been used for the purpose of marking the heliacal rising of Sirius.

Since prehistoric times, the skills necessary for navigating between the small island groups and atolls, which spread across the vast expanses of the central Pacific Ocean, required a highly-developed practical knowledge of the stars, the constellations, and their motions. Not surprisingly the ancient Polynesians and Micronesians cultivated many legends and much lore connected with the bright stars of the southern sky, in particular Sirius. These stars served as both navigation beacons and seasonal markers. As navigational aids, the stars were both essential direction finders and latitude indicators for crossing the trackless ocean. When near the horizon, bright stars such as Sirius were used as "star compasses" to define positions on the horizon by which mariners could chart the courses of their outriggers. A succession of such stars, embedded within familiar constellations, were used throughout the night as they rose and set. Navigation using such markers was called following "the star path". The great usefulness of this stellar navigation system was facilitated by the proximity of most of Polynesia to the earth's equator, where stars in the east and west tend to rise and set nearly vertically.

Another key use of certain stars was as latitude indicators. The correct latitude of a particular island or archipelago could be easily found by sailing north or south until the proper star was directly overhead. For example, Sirius sits at a declination of 17°S, which closely matches the latitude of the island of Fiji at 17°S. Thus, Sirius will pass directly overhead on Fiji each night or day. The stars were also seasonal indicators, which determined the best time of year to undertake certain voyages in order to take the best advantage of the seasonal trade winds and currents. In this regard, Sirius was

one of the most familiar fixtures of both the southern summer in New Zealand and northern winter skies in the Hawaiian Islands.

One of the most widely recognized of the Polynesian constellations was the *Manu*, or "The Great Bird Constellation". This constellation, with Procyon forming the northern wingtip, Canopus the southern wingtip, and Sirius the body, served to divide the Polynesian sky into two sectors. Sirius was also often associated with the small constellation of the Pleiades. The rising of the Pleiades was the prelude to a train of bright stars: Aldebaran, in Taurus; and Rigel, Bellatrix, and Betelgeuse in Orion; followed by Sirius and Canopus. Sirius was a familiar star throughout Polynesia and was known by many names: to the south in New Zealand it was "Rehua"; in the Marquesas on the equator, it was "Tau-ua"; and in Hawaii to the north it had numerous names such as "Aa" and "Hoku-Kauopae".

Throughout much of Polynesia, Sirius was also a well-known seasonal marker. For example, to the Maori of New Zealand in the south the appearance of Sirius in the morning sky coincided with the freezing cold of winter. Their word "takurua" was synonymous with both Sirius and winter. To the north in Hawaii, Sirius was called "Ka' ulua" and its culmination near midnight signaled the time of a great celebration or festival. Sirius was the "Queen of Heaven" and marked the winter solstice.

Much more could be written about the ancient lore associated with Sirius: the topic is virtually inexhaustible. For those interested in Greek and Roman ideas, in particular those associated with the ancient color of Sirius, Roger Ceragioli's articles in the *Journal for the History of Astronomy* and in *Astronomy and Cultures* are very valuable. Another source is the venerable *Star Names Their Lore and Meaning* by Richard Allen, which contains a potpourri of names and associations. For some of the more primal and enigmatic links to Sirius, there is *Hamlet's Mill* by Giorgio de Santillana and Hertha von Dechend. Finally, a very contemporary mythological link with Sirius is the belief system of the Dogon, a sub-Saharan tribe in the modern African nation of Mali. Again, this controversial subject is covered in detail in Chapter 11.