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2/22/93

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Honolulu 96822
date

MEMORANDUM

TO: Tom Lenchanko, Tom Dye, Pat McCoy, Aki Sinoto, Yoshi Sinoto, Paul Cleghorn, Bill Kikuchi, Martha Yent, Roger Rose, Francis Warther, Ruby Johnson, Rudy Mitchell, Glenn Bauer, David Hagino

FROM: Will Kyselka 941-4856

SUBJECT: Ku-kani-loko

The purpose of this paper is to raise our awareness of the Ku-kani-loko birthing site so that its vistas may be preserved from immanent development.

I'm sending copies of this to some 15 colleagues in culture, science and the arts for review and additions. For the more information we have, the stronger the case for preserving.

The initiative in presenting a case for conservation is that of Tom Lenchanko and the Wahiawa Neighborhood Board.

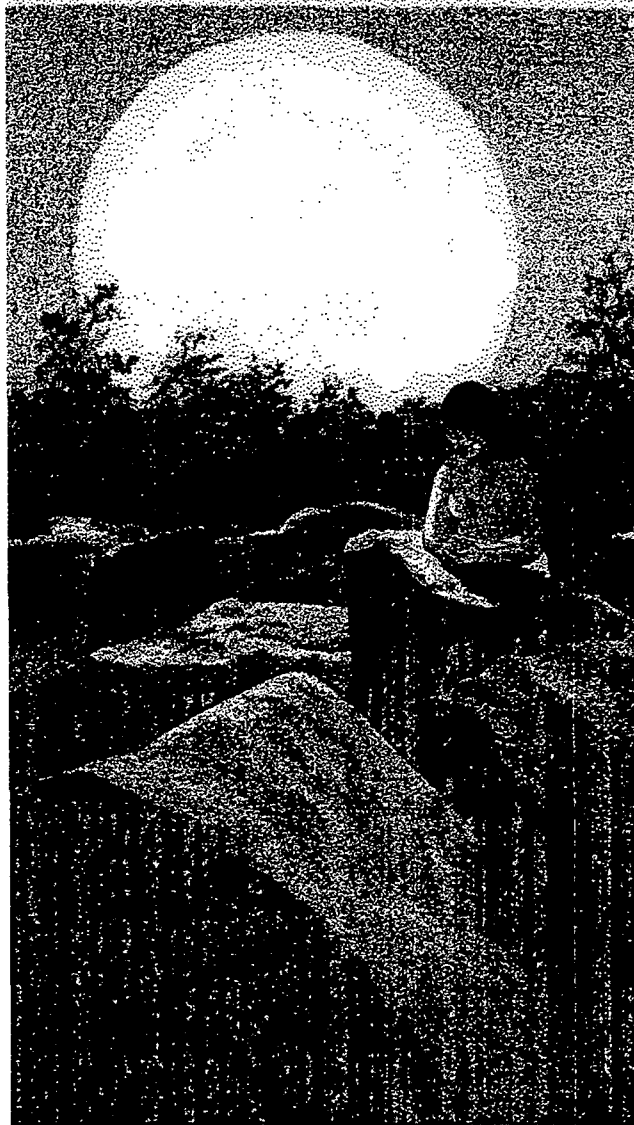
Then there's Makali'i Peak. Why so named? From the zenith passage of the Pleiades? If we went to its summit would we find alignments to significant astronomical events at the horizon?

What is presented here is rough and crude and printed on a printer that needs new toner. Intensive field work needs to be done. Photographs. And what about the Koolau peaks?

Preliminary Thoughts on Ku-kani-loko

Will Kyselka

2/16/92 DRAFT



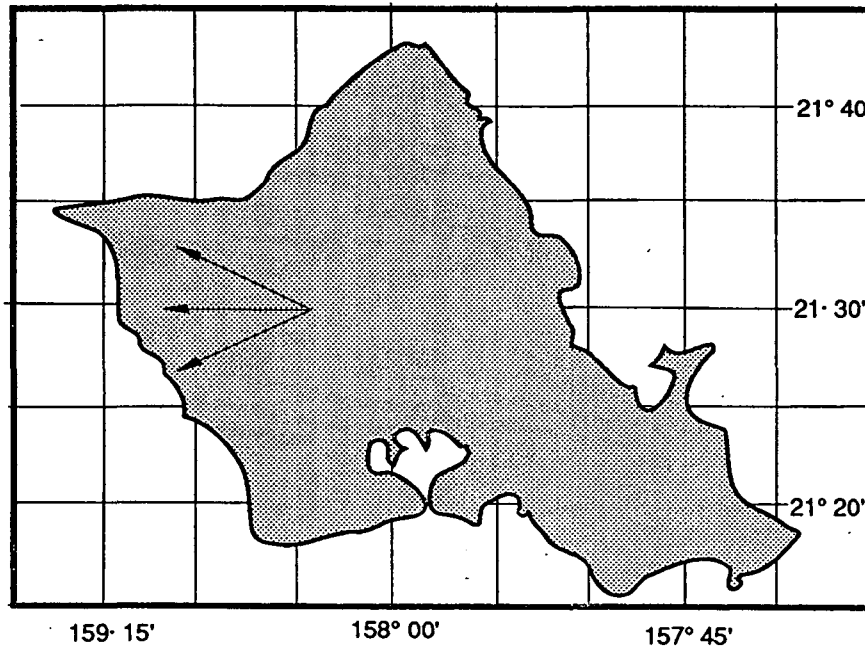
Ray Lanterman¹

Copies to Tom Lenchanko of the Wahiawa Neighborhood Board, Tom Dye, Pat McCoy, Aki Sinoto, Yoshi Sinoto, Paul Cleghorn, Bill Kikuchi, Martha Yent, Roger Rose, Francis Warther, Ruby Johnson, Rudy Mitchell, Glenn Bauer, and David Hagino

Some Preliminary Thoughts on **Ku-kani-loko**

Will Kyselka
2/16/92 DRAFT

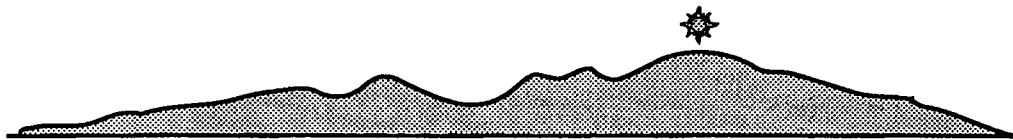
Ku-kani-loko birthing site lies due east of Oahu's highest mountain, Mt Kaala. It is one of two such sites in Hawaii; the other, Holoholoku on Kauai. The equinoctial sun sets directly behind the 4000-foot peak.



The directions of the setting sun at equinoctial and solstitial times, Ku-kani-loko.

Why this site? Might a combination of geographic features and astronomic events have determined it?

Is Ku-kani-loko Hawaii's *Stonehenge*?



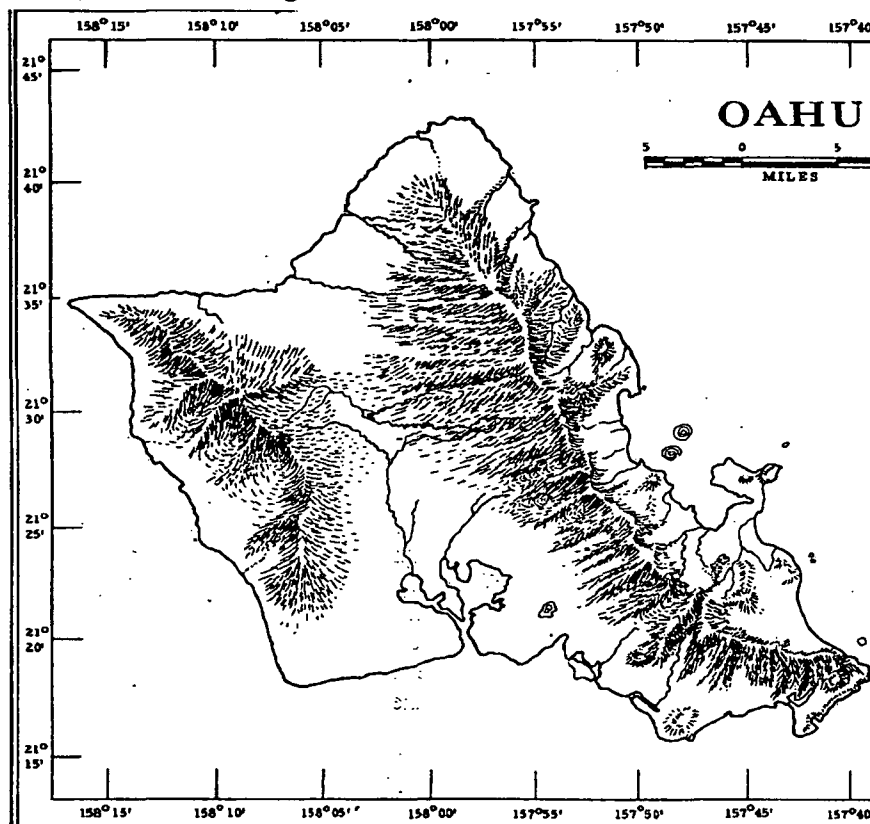
Twice a year the sun sets directly behind Mt. Kaala.

KU-KANI-LOKO IN HAWAIIAN HISTORY

Historian David Malo refers to the "inestimable boon" that Ku-kani-loko afforded in the birthing of royalty:²

Kapawa was a chief who was born at Ku-kani-loko, district of Waialua, island of Oahu. He died at Lahaina, on Maui, and his bones were taken to Iao Valley.

It was held to be a most distinguished honor to be born at Ku-kani-loko. Queens in expectation of motherhood were accustomed to go to Ku-kani-loko in advance, that by undergoing the pains of labor in that place they might confer on their offspring this inestimable boon. Kapawa is mentioned in legends as *ke ali o Waialua*, indicating that he may have passed his youth in that district. Tradition informs us that for some fault, whether of personal character or of government we are not told, Kapawa was deposed from his government.



Ku-kani-loko lies between the summits of the Waianae and Koolau ranges at an elevation of 900 feet. The Waianae lies 7 miles to the west; the Koolau, 9 miles east. The sea is 8 miles north at Haleiwa; 10 miles south at Pearl Harbor.

Fornander³ reports that Kapawa was the son of the chief Nanakaoko and Kahihokalani. Other famous persons born here include Mailikukahi "whose mother was Nononui and father was Puaa of Kahuoi, called a tapu chief of the land." And Kalatmanuia..

Martha Beckwith reports that this site the voices of welcoming ancestors were heard here:⁴

It is this Nana-kaoko and his wife who are the traditional founders on Oahu of the sacred place for the birth of chiefs at Ku-

kani-loko in the uplands of Wahiawa, similar to that already set up at Holoholoku on Kauai. At Ho'olono-pahu (Sounding the pahu drum) the navel cord was tied and cut while the drum sounded. Afterbirth, cord, and later the navel string (piko) were carefully deposited, often in a heiau for safe keeping. This site chosen is one frequently visited by thunderstorms, whose manifestations were regarded as the voice of ancestral gods of the heavens welcoming an offspring of divine rank. The drums perhaps simulated the voice of deity.

For a daughter of a chief of the northern end of the island, Ku-kani-loko was a place of refuge:⁵

Laie-i-ka-wai and her twin sister Laie-lohelohe are born at Laie on Oahu of Kahauokapaka the father, chief of the northern lands of the island, and Malaekahana the mother. Since the father has vowed to let no daughter born to his wife live until she bears him a son, the mother conceals the birth of the twins and gives them to her own relatives to rear, Laie-lohelohe to Ka-puka-i-haoa to bring up at the heiau at Ku-kani-loko, and Laie-i-ka-wai to Waka, who first hides her in a cave near Laie which can be reached only by diving into the pool which conceals the entrance, and then takes her to the uplands of Puna.

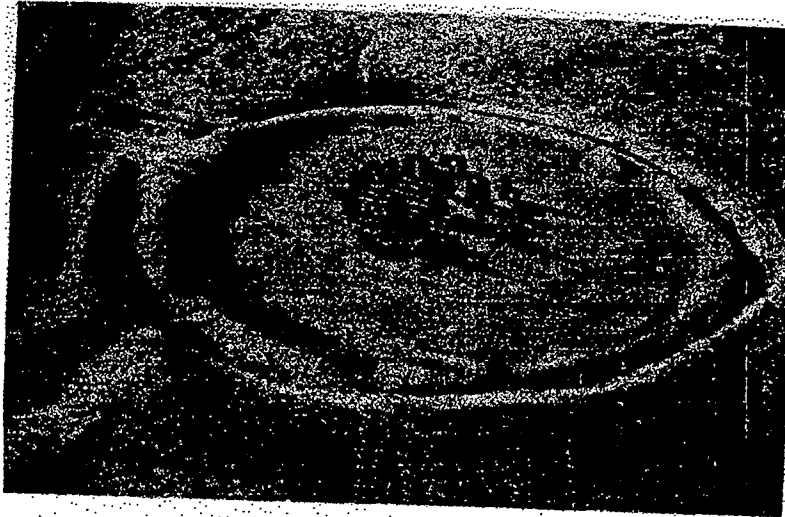
Mythology links the region to cannibalism:⁶

In Wahiawa on Oahu, near the place called Ku-kani-loko, once sacred to the birth of chiefs, is a narrow ridge of land forming a curving pathway between two steep gulches along which men used to travel to reach the mountain timber. At this defile, tradition says, the last cannibals of Oahu took their stand and seized upon victims for their cannibal feasts.

The most complete source of information about Ku-kani-loko is in *Sites of Oahu*, compiled by Elspeth Sterling and Catherine Summers.⁷

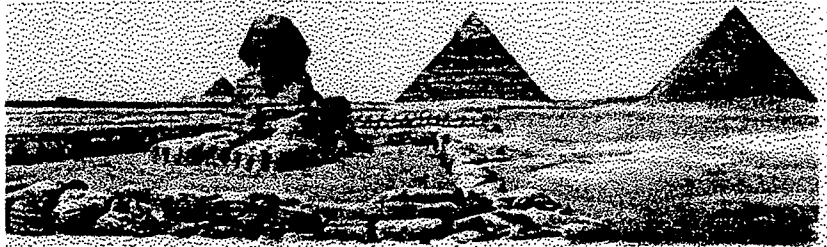
CELEBRATING CELESTIAL KNOWLEDGE

Cultures all over the world have celebrated their knowledge of the heavens in stone.



Stonehenge⁸

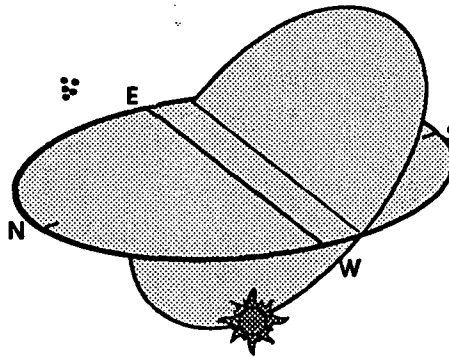
More than four-thousand years ago a people on the Salisbury Plains of England built their Stonehenge that marks the solstitial and equinoctial positions of the sun, serves as a calendar, and has the capability of predicting eclipses.



Ray Lanterman⁹

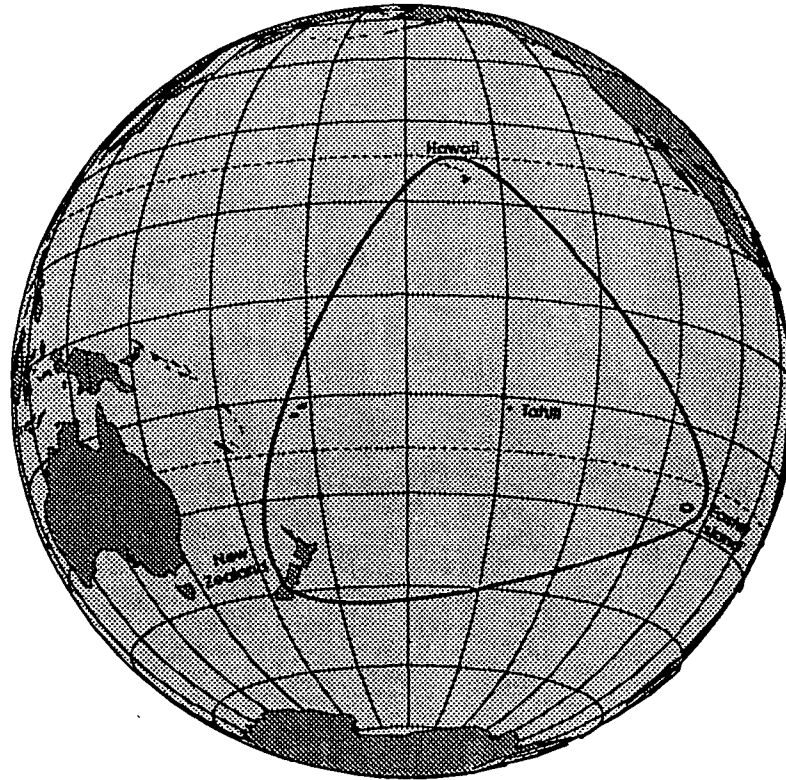
Egyptians oriented their pyramids to the cardinal points of direction to accuracies within 1/12 of a degree. The Chinese celebrate their ancient knowledge of the cardinal directions in elaborate ritual.

Greeks oriented the Parthenon and other temples to the rising of the Pleiades. And in Mexico, the great city of Teotihuacân was oriented to the rising of the Pleiades.



The Pleiades, in mid-October, rising when the sun is 3 hours beneath the western horizon, appear in a completely darkened sky.

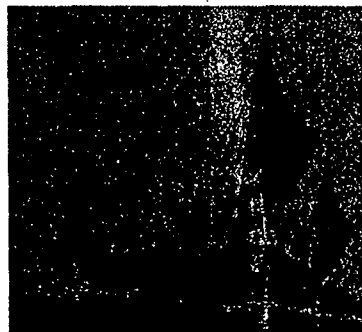
The rising of the Pleiades is remembered in Europe in All Hallows Day. In Hawaii, the rising of this "Cluster of Little Stars" *Na-huihui-o-Makali'i* was a *sign* announcing an event—the Makahiki festival—that began with a *signal*.¹⁰ The four-month festival begins with the Pleiades rising at sunset and ends with the Pleiades culminating in sunset (February).



By AD 1000, the Polynesians had inhabited virtually every habitable island within the Polynesian Triangle.

For the Polynesians of old, knowledge of the heavens was the key to finding tiny islands over vast oceanic distances without instruments. Our knowledge of wayfinding comes largely through the voyages of *Hokule'a*. Nainoa Thompson generated navigational knowledge and tested it over thousands of miles of open ocean voyaging. We know what works, and by projecting back in time we have a better idea of the problems ancient Polynesians faced in finding tiny islands and insights into how they might have solved those problems.¹¹

In light of how other cultures remembered their knowledge in stone, is it not plausible that Hawaiians celebrated their knowledge of the heavens in stone, possibly Ku-kani-loko?

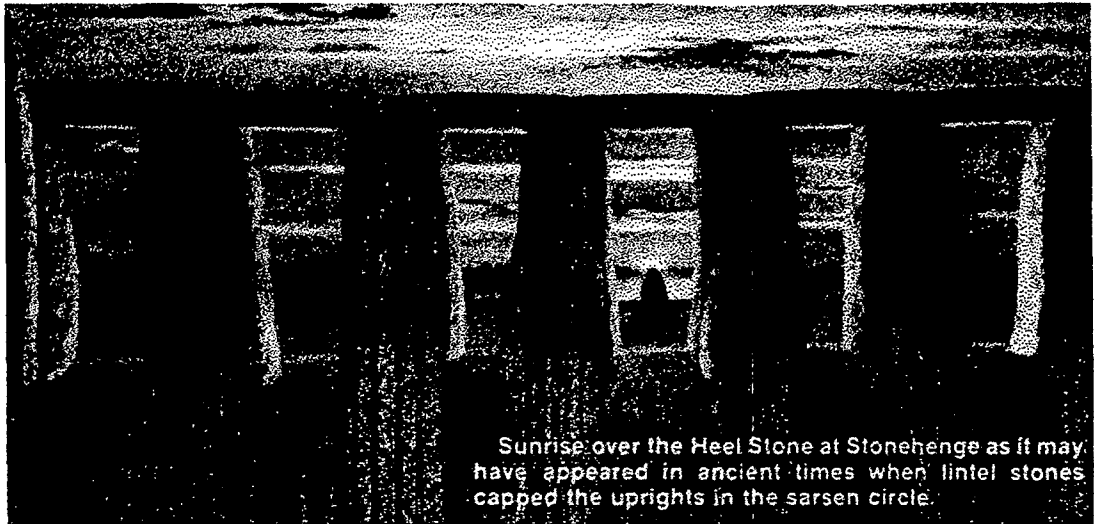


The Southern Cross appears beneath the starboard manu.¹²

MOUNTAINS, SUN AND STARS

Ku-kani-loko lies in a saddle-shaped region between the summits of two gigantic volcanoes, the Waianae and Koolau. The plateau region was formed by massive Koolau lavas flooding against the pre-existing Waianae.

Of the two volcanic peaks, the Waianae is the more imposing, for it is a thousand feet higher two miles closer. The 20-mile Waianae provides a natural backdrop of geographic features against which we see sun, moon, planets, and stars setting.



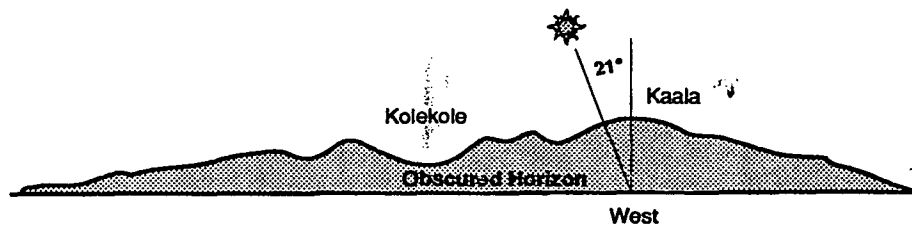
Sunrise over the Heel Stone at Stonehenge as it may have appeared in ancient times when lintel stones capped the uprights in the sarsen circle.

R. Lanterman¹³

Stonehenge, in contrast, is formed of stone arches that serve as sighting portals to significant astronomical events at the horizon.

Twice a year the sun crosses the equator—on its way northward on March 21 and its way southward on September 23—at the vernal equinox and autumnal equinox. Day and night are then of equal length all over the earth. Seen from Ku-kani-loko, the equinoctial sun sets directly behind Mt Kaala.

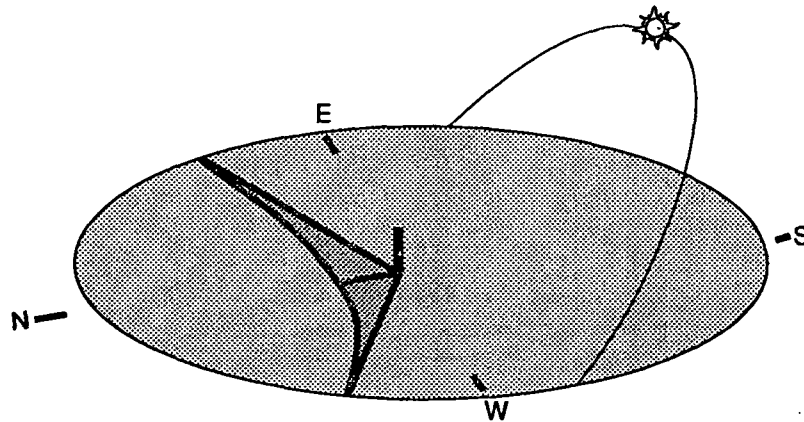
December 22, at the time of winter solstice, the sun sets behind the peak to the south of Kolekole Pass. And at summer solstice, June 22, it sets over Mokuleia and a line of old sea cliffs at the foot of which Kaukonahua Stream runs



The equinoctial sun is on the celestial equator. . At Ku-kani-loko it approaches the horizon at an angle 21° from the vertical.

Shadows may have had a role in Hawaiian thinking. A gnomon, for instance, is an indicator. A stick in the ground, a building, an obelisk—these cast shadows and they “know” where the sun is. Shadow length varies with time of day, with season, and with

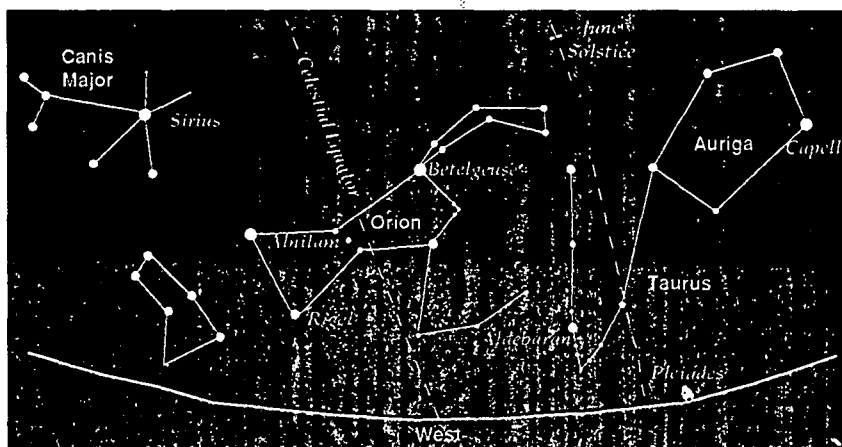
latitude. Francis Warther of Kauai has suggested that the oracle tower in heiau platforms might have been used as astronomical observatories.¹⁴ And, we add, possibly gnomons with shadows pointing to geographic features.



Morning, noon, and evening shadows of a gnomon at the time of winter solstice, latitude 21°N. The sun on December 22 is 44.5° south of the zenith. Shadows at noon are nearly as long as an object is high. The shadow of a meterstick, for example, is then 98 cm.

Sun, moon and planets—not stars—vary their setting positions with the time of year. Stars rise at discrete points on the eastern horizon and set at corresponding points on the western horizon. The points do not change in so short a span as a human lifetime.

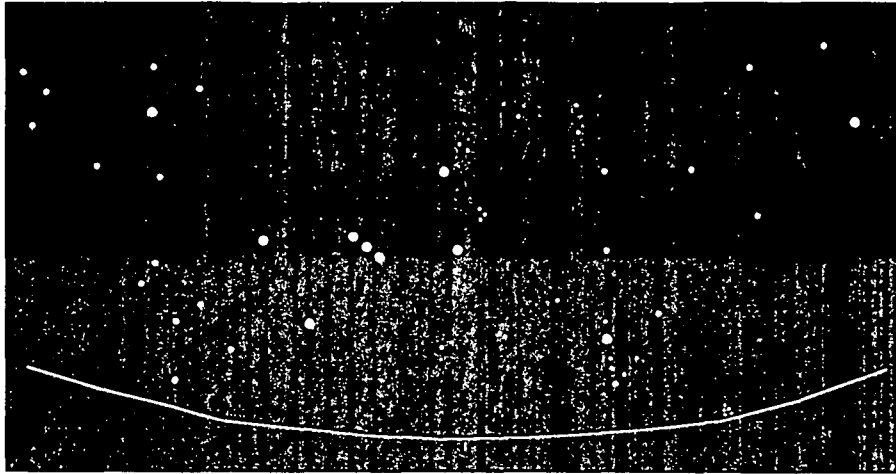
Stars, like the sun, moon and planets, set behind the Waianae mountains. The three-in-a-row in Orion's Belt set behind Mt Kaala for they are just about on the equator as the sun is at equinoctial times.



The sky looking directly west from Ku-kani-loko on April 17, 1500 at 8:00 p.m. with Orion about to set. The three stars marking Orion's Belt set behind Mt Kaala at all times of year since these "Three Canoe Paddlers" travel along the celestial equator.

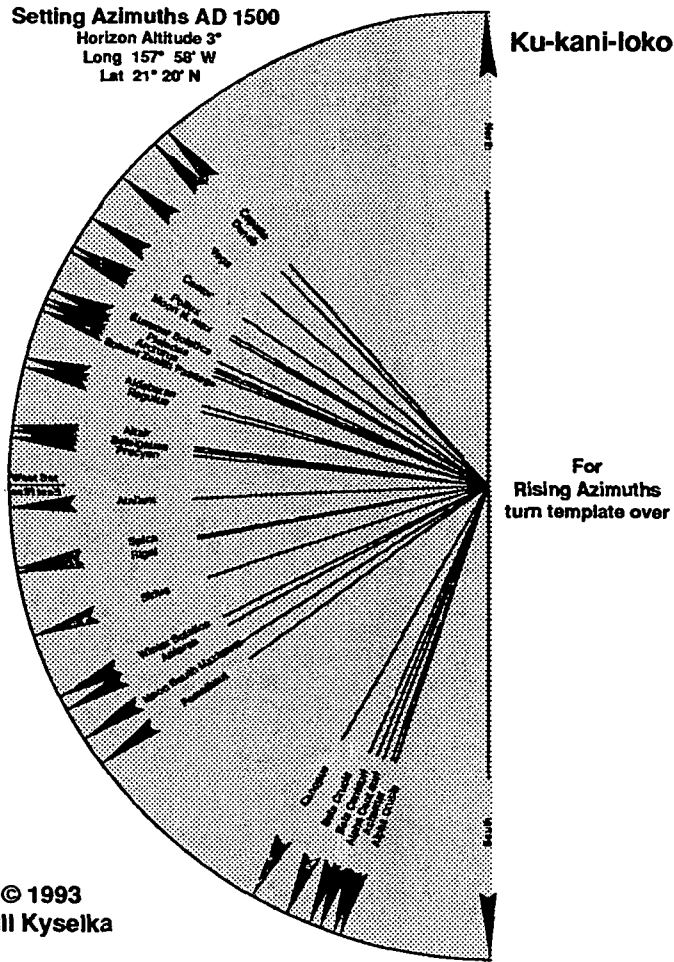
Sirius, the brightest in the sky and one that travels over Tahiti, sets into Kolekole Pass. Hokule'a (Arcturus) sets over Kaena

Point in nearly the same direction as the Pleiades



As in the previous diagram but without identifying lines and names. A line across the three-in-a-row extend to the southwest comes to the brightest star in the sky, Sirius, that travels over Tahiti. Extended in the opposite direction it comes to a "Cluster of Little Eyes," *Na Huihui o Makali'i* (Pleiades).

Both the Pleiades (*Makali'i*) and Arcturus (*Hokule'a*) travel over Hawaii. One could look straight up at the *zenith* to see them going overhead. Since they are about halfway across the sky from each other one is in the sky nearly all the time.

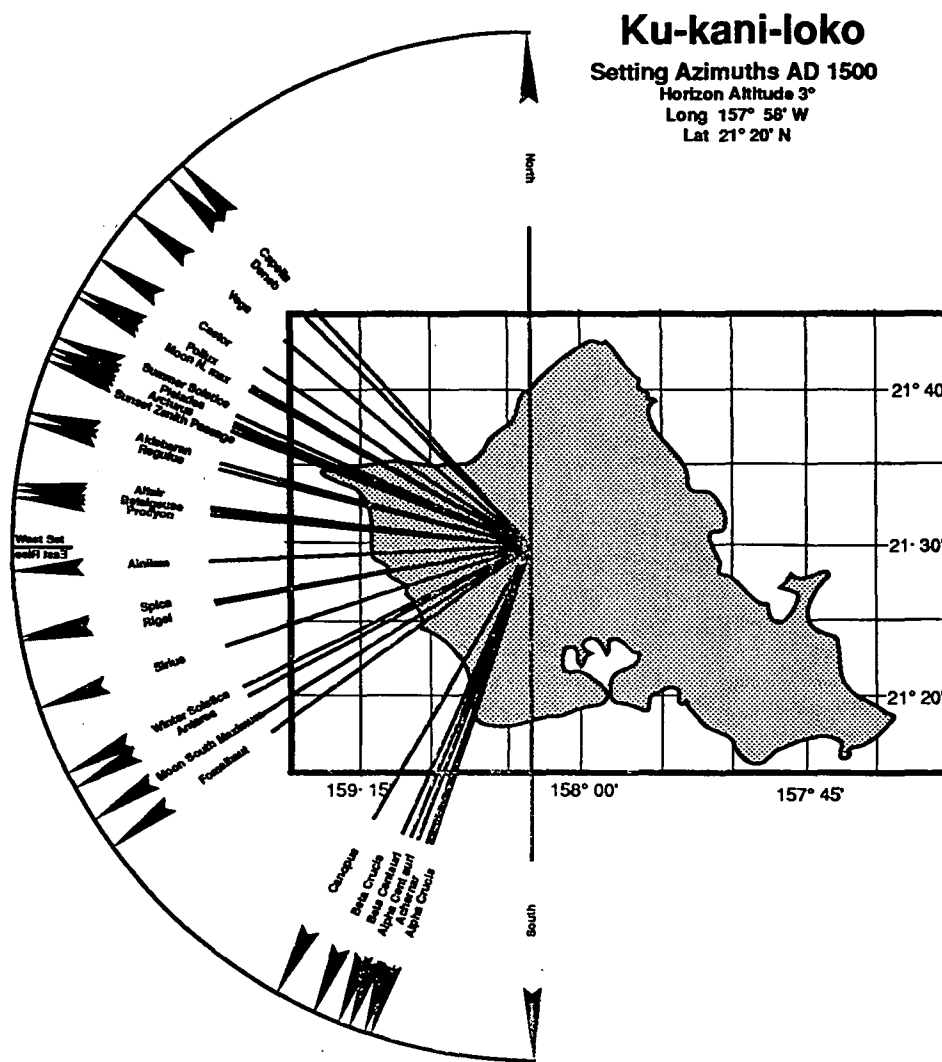


Template for checking stellar azimuths against a geographical background.
Azimuths for AD 1500 at latitude 21°.

**Ku-kani-loko
Azimuths, AD 1500
Latitude 21° North**

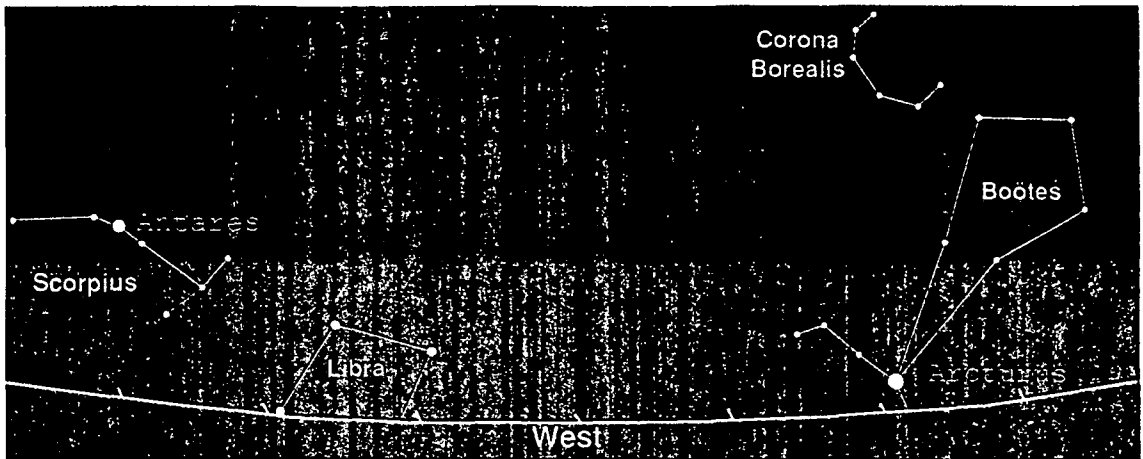
Star/Event	3° Horizon		0° Horizon	Easter
	Rise	Set	Set	Island
Achernar	161° 01'	198° 59'	202° 44'	166 05
Aldebaran	74 35	285 25	286 43	
Alpha Centauri	159 13	200 47	204 17	163 01
Alpha Crucis	161 52	198 08	202 01	165 46
Altair	82 52	277 08	278 24	81 16
Antares	118 22	241 38	243 07	117 34
Arcturus	67 39	292 21	293 48	55 14
Beta Centauri	157 58	202 02	293 43	160 00
Beta Crucis	156 32	203 28	205 22	
Betelgeuse	83 22	276 38	277 54	81 57
Canopus	150 22	209 38	212 12	152 14
Capella	41 56	318 04	319 56	36 41
Castor	55 45	304 15	305 46	51 36
Deneb	43 55	316 05	317 53	29 20
Fomalhaut	126 12	233 48	235 25	126 57
Mintaka	92 50	267 10	268 27	90 28
Pleiades	67	293 00	294 22	64 19
Pollux	59 49	300 11	301 38	56 07
Procyon	84 13	275 47	277 03	82 21
Regulus	75 42	284 18	285 37	73 51
Rigel	100 38	259 22	260 41	99 44
Sirius	108 27	251 33	252 54	108 00
Spica	100 13	259 47	261 05	99 31
Vega	49 39	310 21	311 59	45 00
`Dec solstice	116 33	243 27	245 02	
`Jun solstice	65 37	294 23	295 36	
`Moon N max	60 35	299 25	300 50	
`Moon S max	122 34	237 26	239 00	
`Zenith passage	68 33	291 27	292 48	

Here the *piko*, the navel, the center of the island, the site of the Birth Stones, a place sacred to ancient Hawaiian royalty. From this place at the *piko* of the island you can look toward important astronomical events that occur in line with prominent landmarks.



Many rocks even with the ground as if gigantic stepping stones. Scattered rocks a foot above ground. A "healing stone" imported earlier this century has since been returned to preserve this site. Place of power at the geometric center, birthing, at the navel of the island. Eucalyptus and palm trees now planted here. Rolling hill to the north blocks view of the sea.

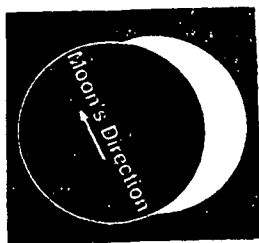
Higher stones toward center, flatter ground-sunken ones at edge. No apparent alignment of the stones. Rain solution grooves in one as pointers, like the edges of . Flat stone 6 feet in diameter. [Here the picture of the rock with concentric circles] Boulders 2-3 feet high. Sun sinking south of Kolekole pass. Heavy gray clouds covering and red-orange sunset behind it. One southwestern facing stone with rest for back could be the spot.



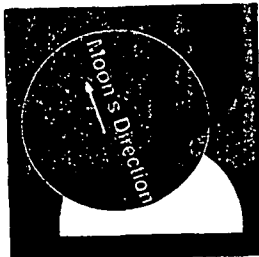
Orange-red Arcturus (*Hokule'a*) and red Antares in Scorpius (*Mau's Fishhook*) setting with the "Basket" (Corona Borealis) following. In legend, Corona Borealis was the basket from which the children of the gods took the stars and placed them in the heavens.

It is plausible that early Hawaiians of old celebrated their knowledge of the heavens in stone. The alignment of Ku-kani-loko to Mt Kaala may be coincidence. But an artifact there, a circle, may have been a sundial. And the peaks themselves reminders of where the sun is at various times of year.

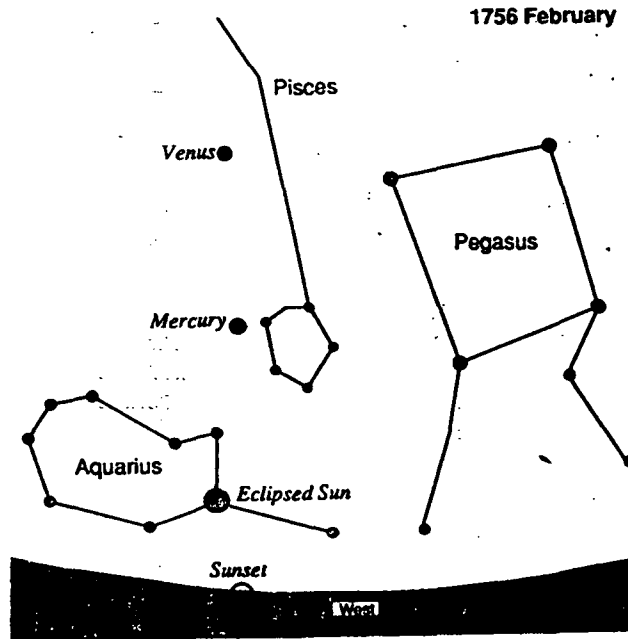
A calendar of events? What mana must have attended a child born when the sun was setting behind Mt Kaala where also the three-in-a-row set. Or to be born at a time the sun was setting into Kolekole. Or when when setting over Mokuleia and the seacliffs and toward Kauai. The great Mahuku heiau above Waimea Bay is oriented toward the summer solstice, toward the setting of the Pleiades and Arcturus.



Maximum, 5:59 p.m.



Sunset, 6:31 p.m.



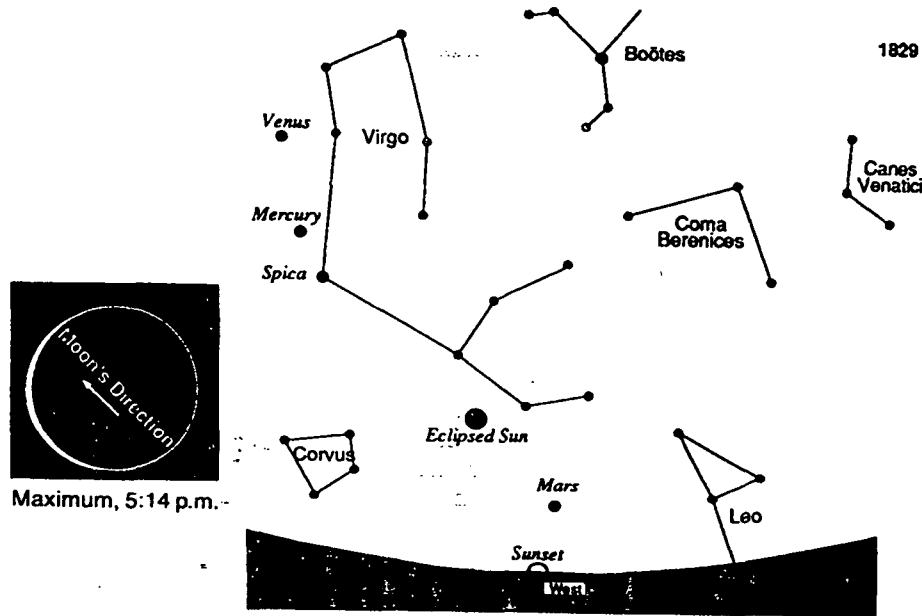
ECLIPSES

The year 1756—about the time of Kamehameha's birth—was a strange one. Hawaii had two solar eclipses that year, one at sunrise and the other at sunset. And three years later Comet Halley appeared. An eclipsed sun set on the north rim of Kolekole Pass on February 29, 1756¹⁵

The sun was in Aquarius on that extra February day, nearing the western horizon when the unseen moon moved up (eastward) across its face, hiding 80 per cent of it. The sky grew dark as if the sun were setting 40 minutes ahead of time. Brightening as it neared the horizon, it set, still a quarter of it covered. Observers 300 miles south of Hawaii in the path of centrality would have seen it with sunlight, for this was an annular eclipse.

Mercury and Venus lingered for a brief time in the twilight, leaving the sky with plunging Pegasus.

An even more spectacular eclipse occurred September 27, 1829, nearly at equinoctial time with the sun setting behind Mt Kaala.¹⁶



The sun was just past the equator on an equinoctial afternoon and nearing the horizon. The sky darkened, and all but 3 per cent of the sun disappeared, the thinnest of thin crescents. The path of centrality of this annular eclipse was 50 miles north of the island of Kauai. Mercury and Venus were two bright objects in the evening twilight.

CONCLUSION

From a quick glance we can say that Ku-kani-loko is no Stonehenge. Perhaps some of its stones were bright from long distances, but there are no obvious sighting portals. However we have not studied the site intensively

Because of its intriguing placement relative to Mt Kaala it is

imperative that this site retain its vistas of the Waianae and Koolau.

Intensive study may reveal aspects of Ku-kani-loko that we do not presently see.

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- 1 Terrance Barrow and Ray Lanterman, *More Incredible Hawaii* (Rutland Vermont: Charles F. Tuttle Co., 1985) 35. (from a photograph by Francis Haar)
 - 2 David Malo, *Hawaiian Antiquities*. (Honolulu: Bishop Museum Press, 1951) 246.
 - 3 Fornander
 - 4 Martha Beckwith, *Hawaiian Mythology* (Honolulu: The University Press of Hawaii, 1970) 377
 - 5 Beckwith, *Mythology*, 526
 - 6 Beckwith, *Mythology*, 340.
 - 7 Elspeth P. Sterling and Catherine C. Summers *Sites of Oahu*. (Honolulu: Bishop Museum Press, 1978) 138-141.
 - 8 Will Kyselka and Ray Lanterman, *North Star to Southern Cross* (Honolulu: University of Hawaii Press, 1976)9.
 - 9 Kyselka, *North Star* 7.
 - 10 Kyselka, "On the Rising of the Pleiades," *Hawaiian Journal of History* (in press)
 - 11 Kyselka, *An Ocean in Mind* (Honolulu: University of Hawaii Press, 1987)
 - 12 Kyselka, *Ocean* 11
 - 13 Kyselka, *Ocean* 15
 - 14 Francis X. Warther, *Advertiser? Star-Bulletin?* article.
 - 15 Kyselka, "Solar Eclipses in Hawaii," *Hawaiian Journal of History* (1991)35.
 - 16 Kyselka, "Solar Eclipses," 40.