A primitive calendar used by prehistoric farmers in Japan

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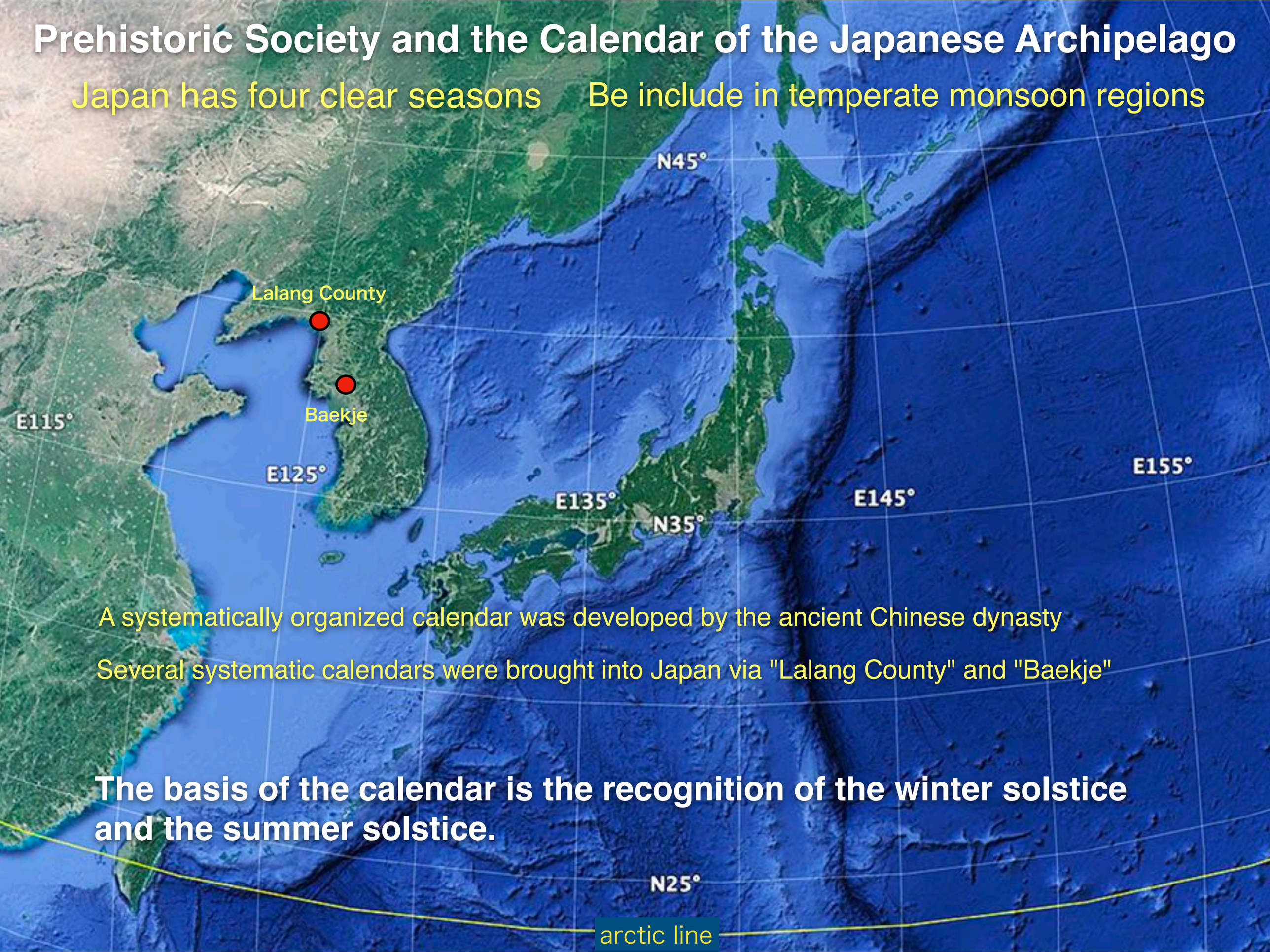
Prehistoric Society and the Calendar of the Japanese Archipelago

Japan has four clear seasons　Be include in temperate monsoon regions



A systematically organized calendar was developed by the ancient Chinese dynasty

Several systematic calendars were brought into Japan via "Lalang County" and "Baekje"

The basis of the calendar is the recognition of the winter solstice and the summer solstice.

Chronological table of various cultures in the prehistoric period of Japan

33,000 B.C.

Paleolithic period

Hunter-gatherer culture

14,000 B.C.

start of a residential life

Did they recognize the summer solstice and winter solstice?

Jomon period

Hunting and gathering and garden culture

● Sizunai gotenyama site

750 B.C.

Yayoi period

Rice-paddy farming culture

early state stage

● Hirabaru tomb1

Japanese records in Chinese history documents

「漢書・地理志」

Japanese records in Chinese history documents

「魏志倭人伝」

260 A.D.

Kofun period

early state stage

Systematic calendar from Paekje.

「天文博士」来日

588 A.D.

Systematic calendar introduced from Chinese dynasty.

暦導入

Asuka and Nara periods

formative period of a state

710 A.D.

The two prehistoric sites that we're going to see

Sizunai gotenyama site

Hunting and gathering and garden culture

1,500 B.C.

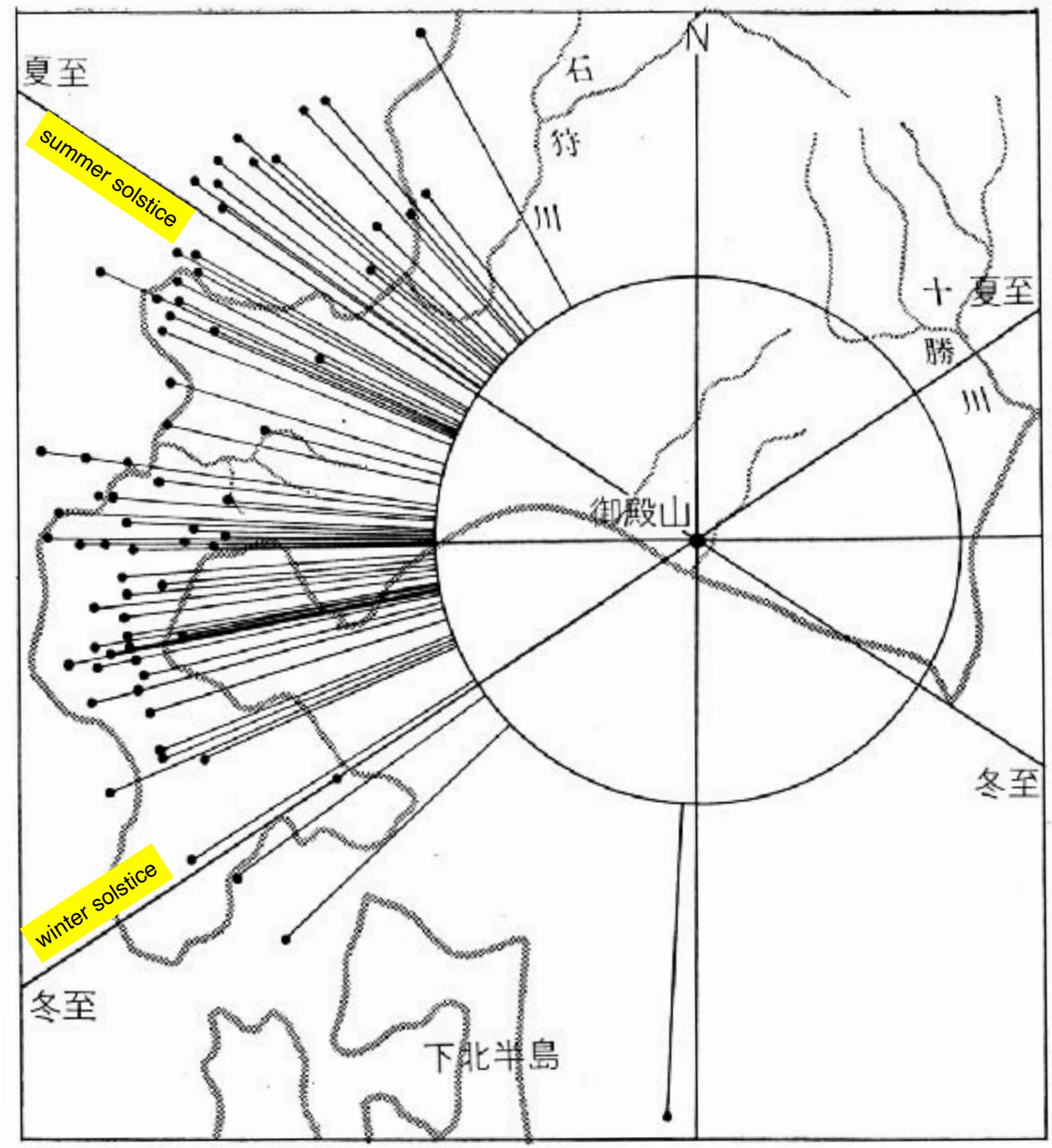
42°22′15.71″N.
142°23′33.13″E.

Hirabaru tomb No.1

Rice-paddy farming culture

150-180 A.D.

33°32′32.36″N.
130°13′42.22″E.



御殿山墳墓群の頭位方向
74例(北緯42°19')。

藤本英夫1970『北の墓』学生社,157頁より転載

Pioneering work by Hideo Fujimoto

1970 implementation

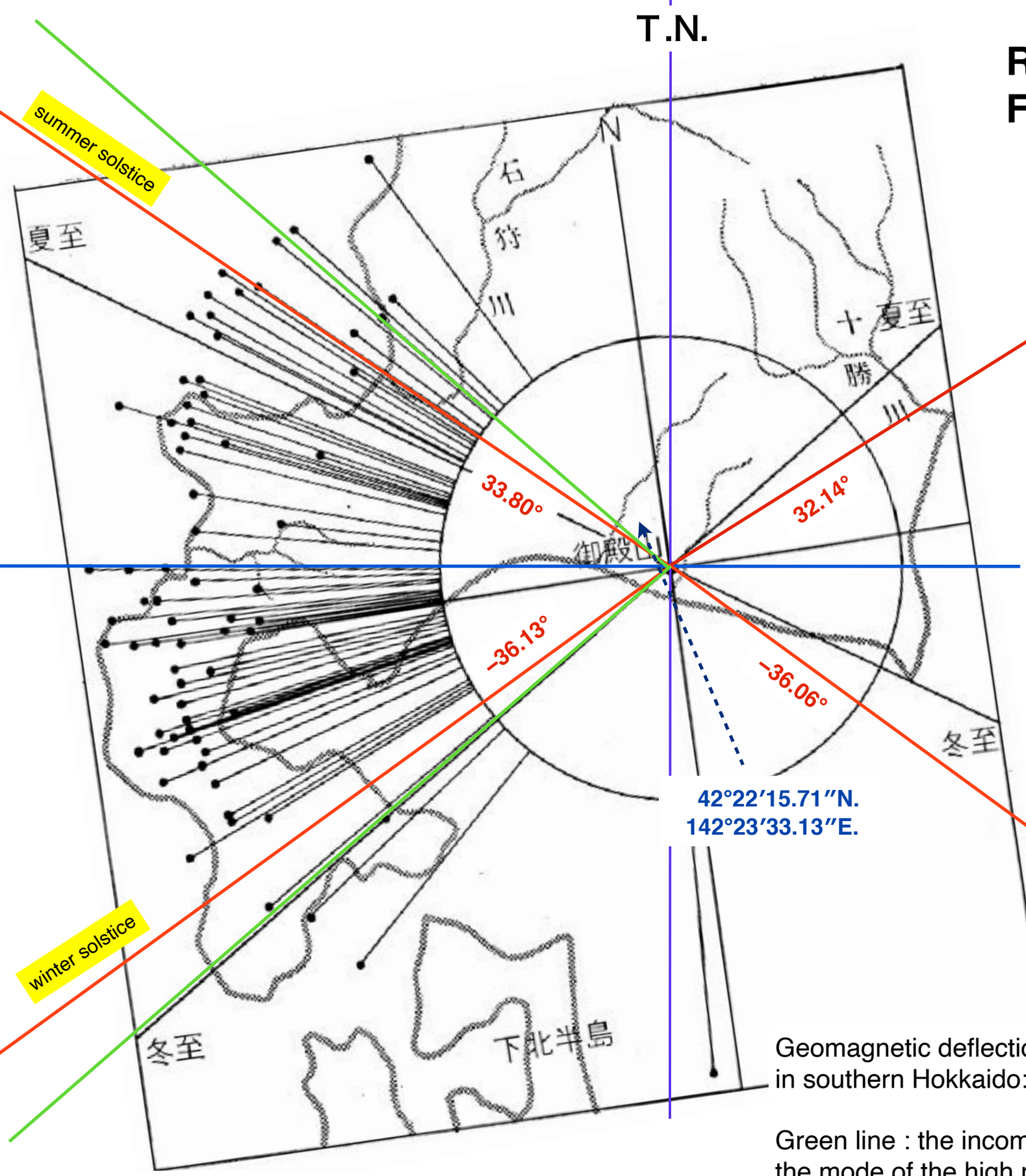
Hideo Fujimoto, an archaeologist who is out of power, measured and totaled the head positions of 74 burials found in the Shizunai Gotenyama site from the late Jomon period along the magnetic north, and made this map in comparison with the range of the annual sunrise and sunset directions there.

From this, it is considered that people in the Jomon period assumed the place where the dead lived in the next world in the direction of sunset.
This map was the pioneer of the research on the head position of burial in the Jomon period.

17 cases out of the direction of sunset in a year

Result of azimuth correction on Fujimoto figure

The date is set around 1500 B.C.



藤本英夫1970『北の墓』学生社,157頁より転載

This figure is the original figure of Fujimoto with the orientation adjustment. First, a correction to true north is made taking into account the magnetic deflection angle as of 1970, and then the directions of sunrise and sunset around 1500 BC (latter half of the latter half of Jomon period) are repeated. This correction confirmed the high possibility that the burial position of the remains was determined based on the direction of sunset during the year.

11 cases of deviating from the annual direction of sunset

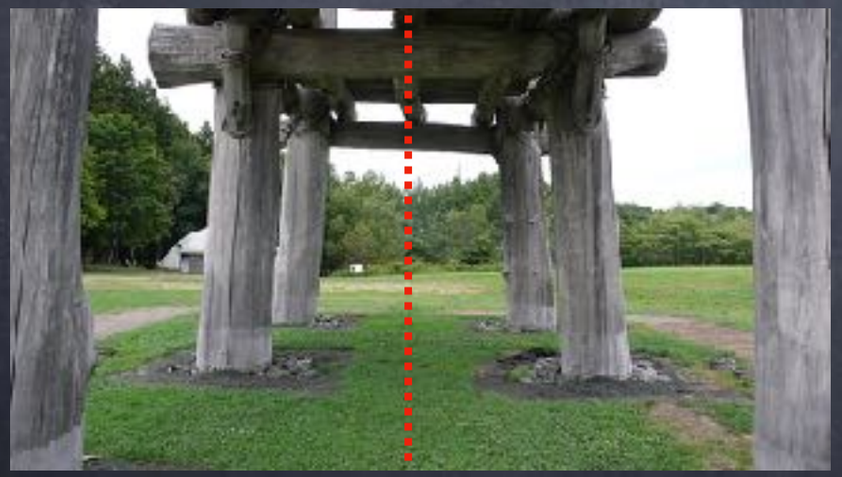
6 cases of deviation from the annual moon orientation in the high moon mode

Geomagnetic deflection angle at 1970 in southern Hokkaido: N8 ° W

Green line : the incoming direction of the moon around the solstices in the mode of the high moon

Evidence of summer and winter solstice awareness identified from ritual relics of Jomon and Yayoi period archaeological sites

Middle Jomon period

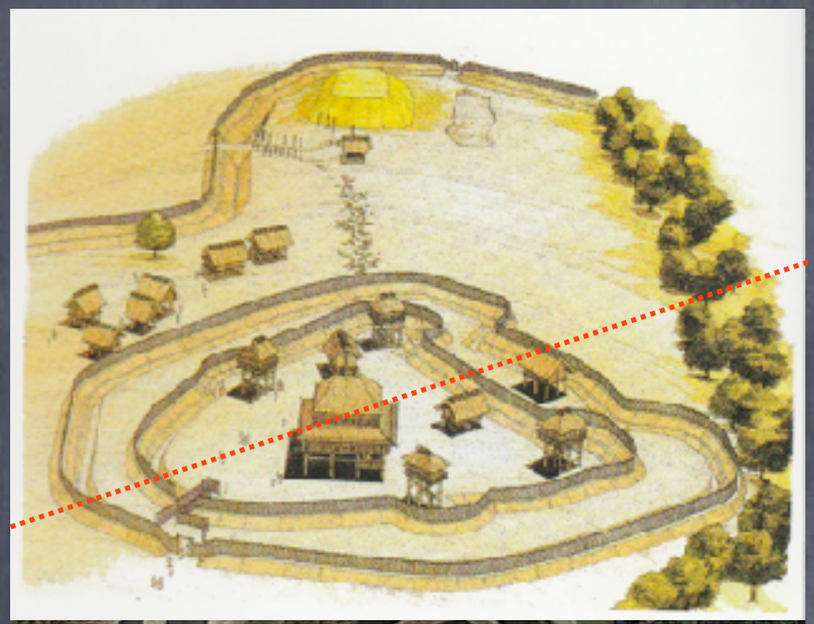


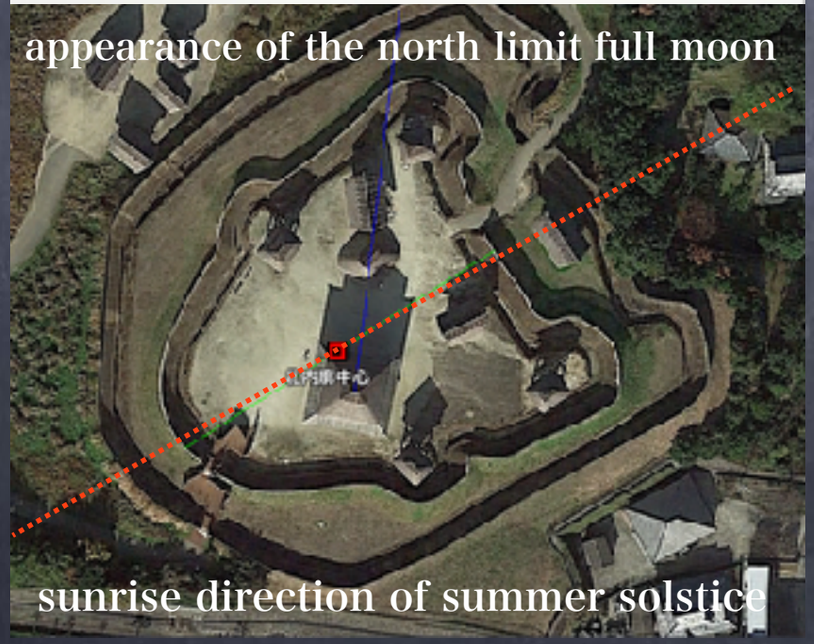
appearance of the north limit full moon

sunset direction of winter solstice

Sannai-Maruyama, Aomori pref.

Late Yayoi period





Yoshinogari , Saga pref.

At present, there are 3 examples in the Jomon period remains, 3 examples in the Yayoi period remains, and around 10 examples in the keyhole-shaped mounds of the Kofun period, and it is known that people in the prehistoric society recognized the Summer and Winter solstice, and the axes of rituals and burial sites were aligned to the same direction.

In addition, ancient structural remnants of religious rituals were found, whose axes were aligned with the direction of the appearance of the full moon, the northern limit, which appeared around the winter solstice in the high moon mode.

Hirabaru tomb No.1, Fukuoka Prefecture

1965 excavation and research achievements by Dairoku HARADA

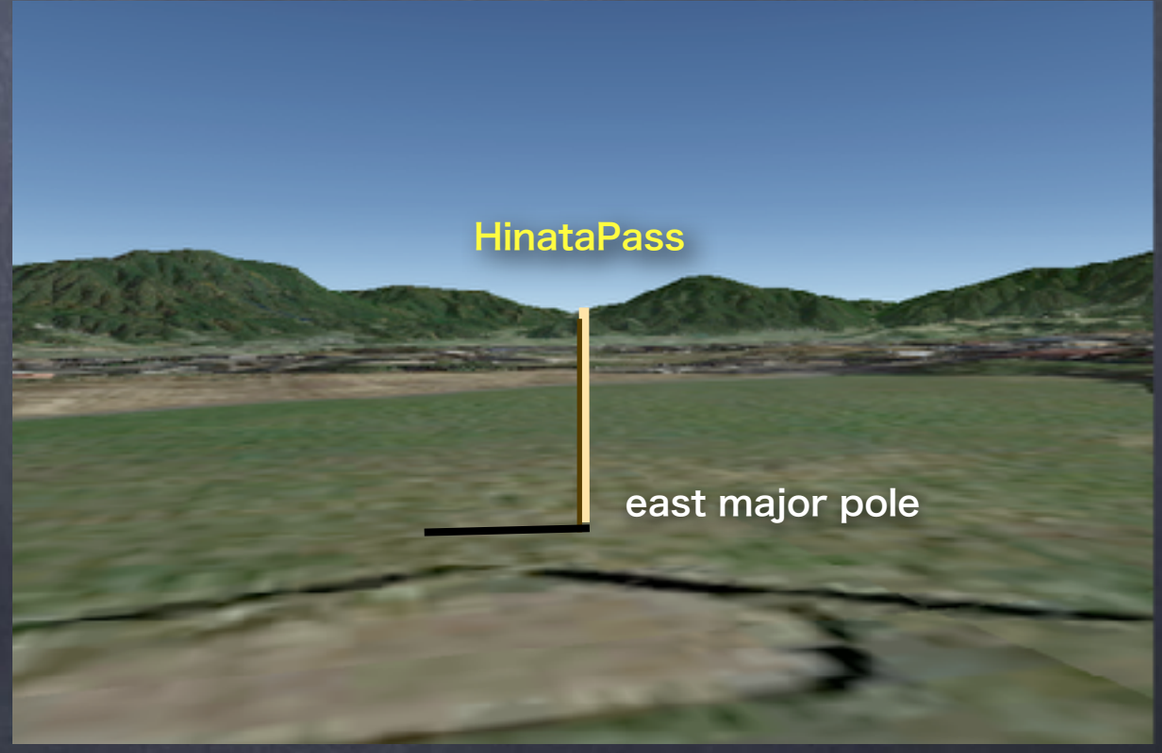
Sunrise Calendar for Rice-paddy Farmers

Dairoku HARADA

1965 excavation and research achievements by Dairoku HARADA

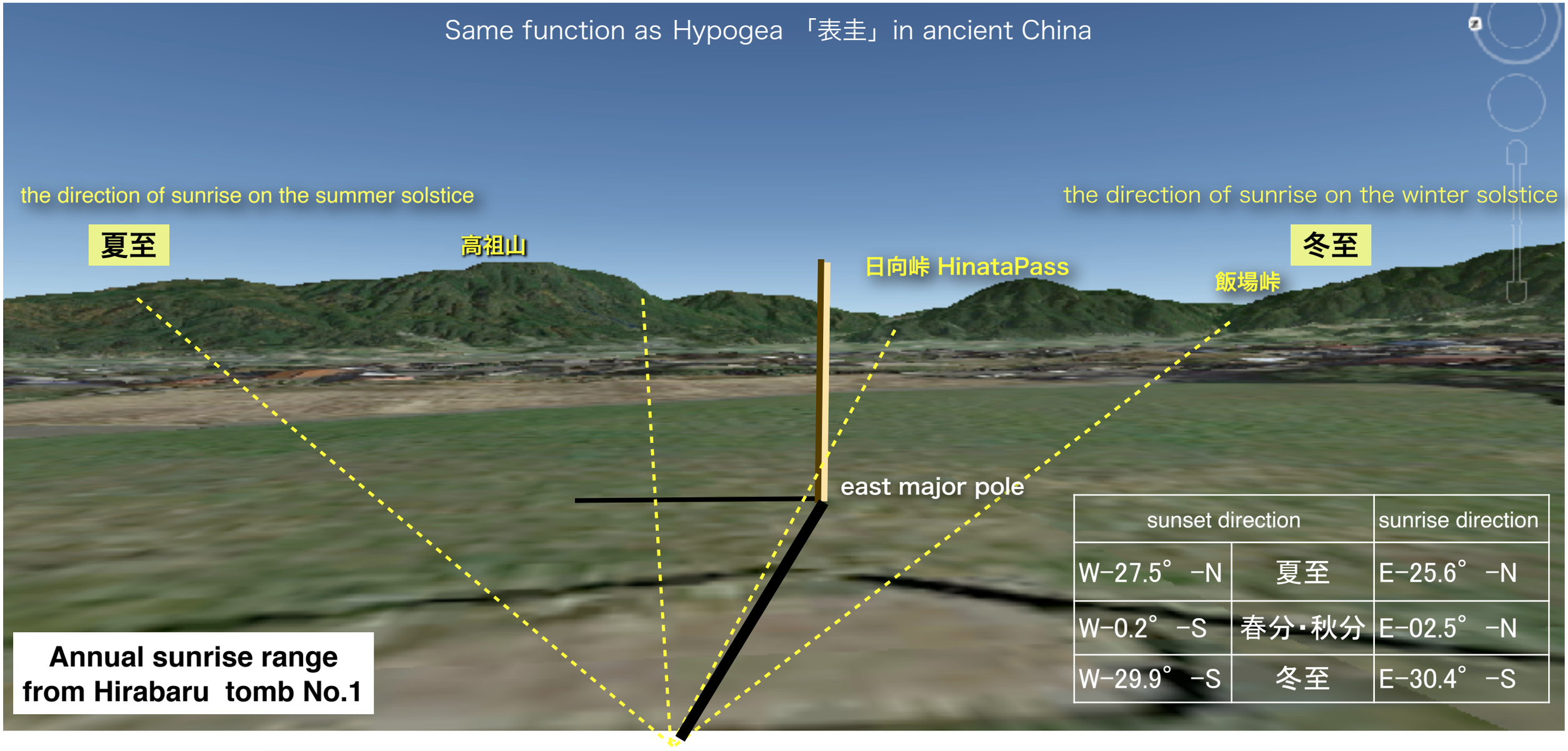
The tomb was excavated and researched in 1965 by Dairoku Harada, an archaeologist who was out of office, and 40 bronze mirrors including the largest five mirrors in Japan were found there.
Harada regarded the buried person as a grave of Princess Ito state, and advocated the theory that she was a goddess who shut herself up in the sun rising from “Hinata Pass”, so it was ignored by the archaeological community of Japan at that time.

In 1998, the remains of “ east major pole" were identified from the east of the tumulus through a reinvestigation. The fact that the focus of the burial was on ”Hinata Pass” was reconfirmed.



newly recognized east major wooden pole in1998

The function of the pole is to know the time through its shadow.

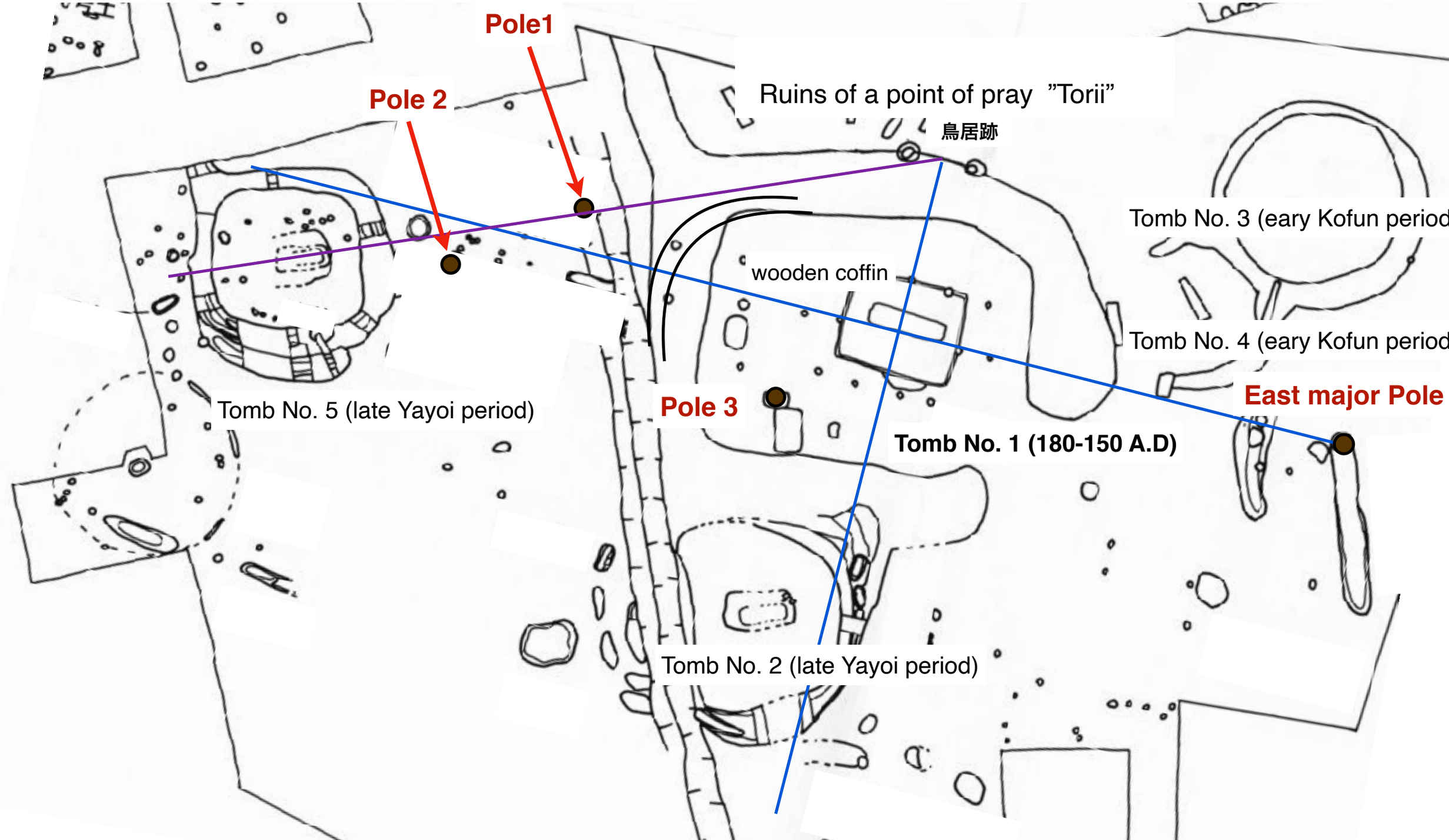


sunset direction		sunrise direction
W−27.5° −N	夏至	E−25.6° −N
W−0.2° −S	春分・秋分	E−02.5° −N
W−29.9° −S	冬至	E−30.4° −S

mountain and pass	latitude N	Longitude W	azimuth angle	Distance
可也山（西北西）	33°34′18.20″	130°09′43.99″	298°09′00″	6,968m
高祖山（東）	33°32′53.30″	130°16′07.29″	80°19′48″	3,723m
宮地岳（西）	33°32′29.46″	130°10′55.84″	268°50′24″	269m
日向峠（東）	33°31′48.40″	130°17′15.76″	103°47′40″	5,674m
王丸山（東）	33°31′29.25″	130°16′50.30″	111°56′24″	5,225m
飯場峠（東南東）	33°30′40.06″	130°17′12.57″	122°43′12″	6,432m
平原１号墓主体部	33°32′32.36″	130°13′42.22″		

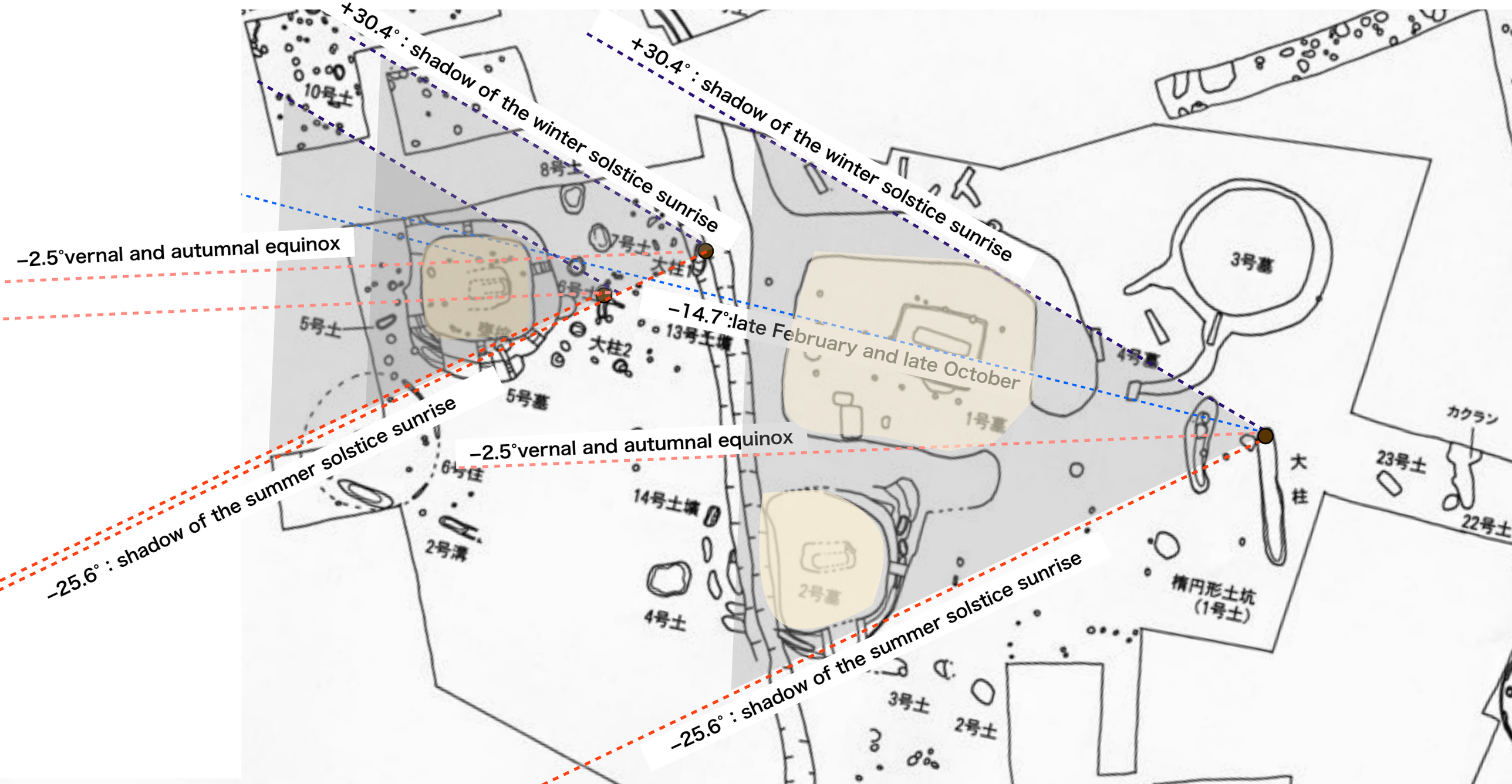
A plan view of the Hirabaru burial mounds

Five burial mounds were found.
4 remains of poles including the east major pole were found on both east and west sides of Tomb No.1
Remains of a place of worship "Torii" was also found from the north of the Tomb No. 1.

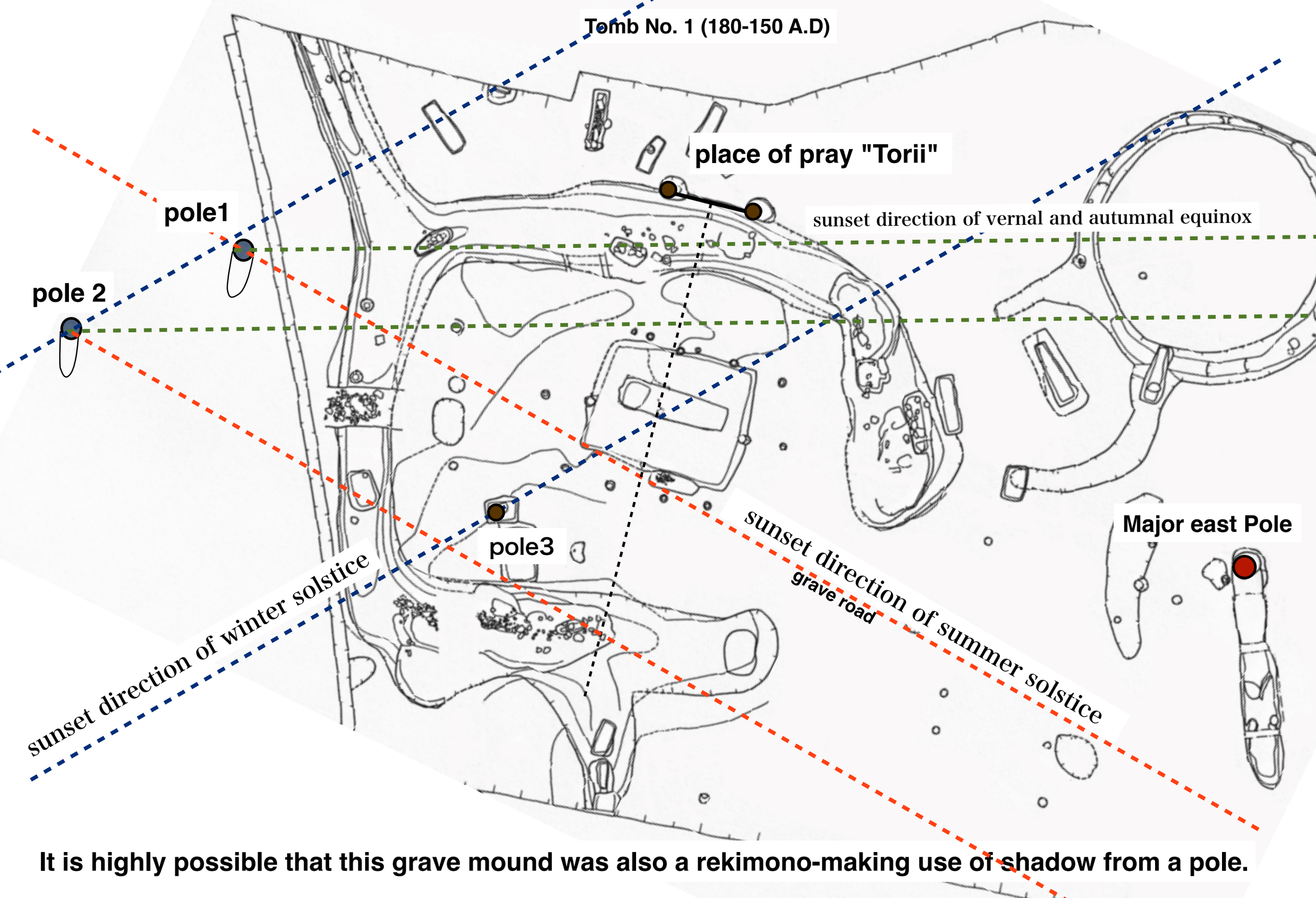


The direction and range of shadows from each pole extending immediately after sunrise throughout the year

The orientation of placing the burial ground in the shadow area extended from each pole at the time of sunrise in a year can be confirmed　(the date of sunrise is based on 150 A.D.).

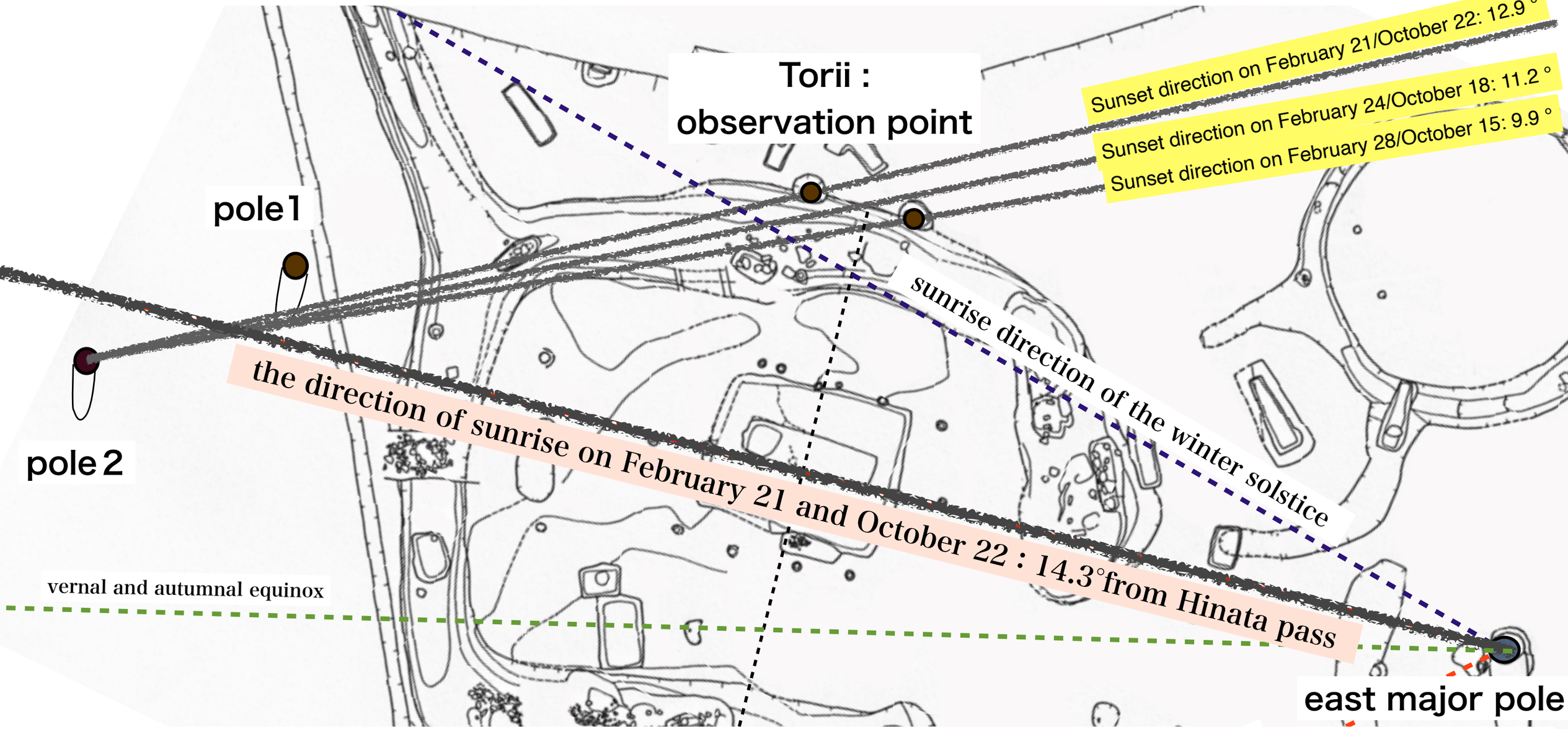


Relationship between three wooden poles and the direction of sunset



It is highly possible that this grave mound was also a rekimono-making use of shadow from a pole.

The combination of the direction of the shadow extending from major eastern pillar and the shadow extending to “ Torii”



The spring ritual of 150 AD: knowing the date by the shadow extending from the east major pole to the center of the tomb.

The rite of thanksgiving for the harvest of 150 AD: the shadow extending from the east major pole to the center of the burial pit tells the date.

The dates of spring and autumn rituals can be known by the shadows cast on the “Torii” just before evening.

A comparison between descriptions in Chinese historic books about the sense of the calendar held by Yayoi people in this period and the actual condition of the archaeological site

The article of the Giryaku quoted in the 'Gishiwajinden' (literally, an 'Account of the Wa' in "The History of the Wei Dynasty")

「魏略曰 其俗不知正歳四節 但計春耕秋収為紀年」

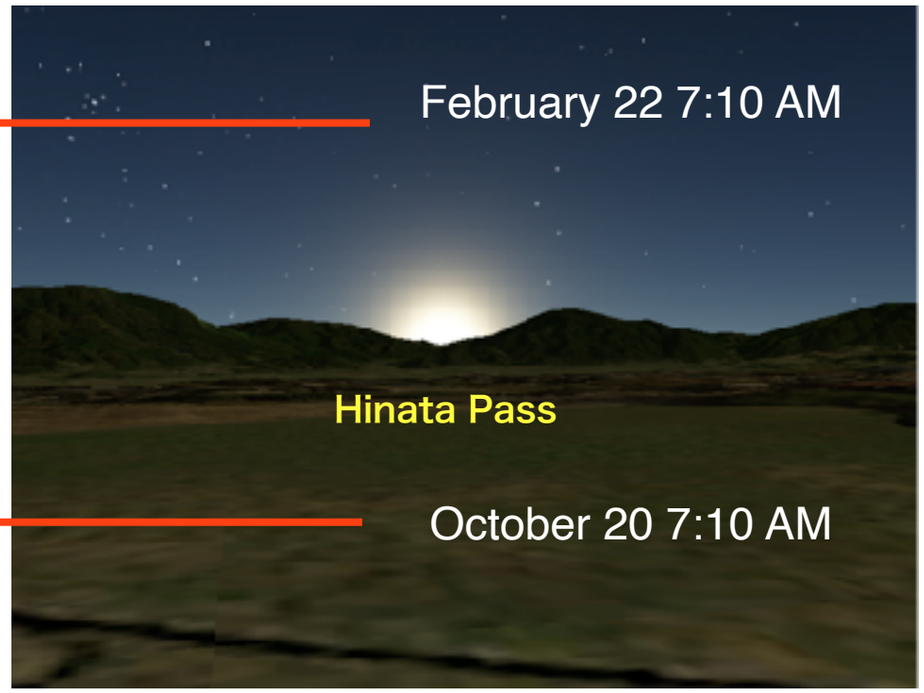
"According to 'Wei Lue’「魏略」 They do not know the winter solstice or summer solstice or the difference of the four seasons. However, it says that the calendar is made yearly by measuring the cultivation in spring and the harvest in autumn."

Precedence of spring 「祈年祭」: Held from February 17 to 23rd.

A pair of important rites in spring and autumn

Ceremony of thanksgiving for the autumn harvest 「神嘗祭」: Held from October 15 to 25th.

From the Ise-jingu Shrine website 伊勢神宮HPより

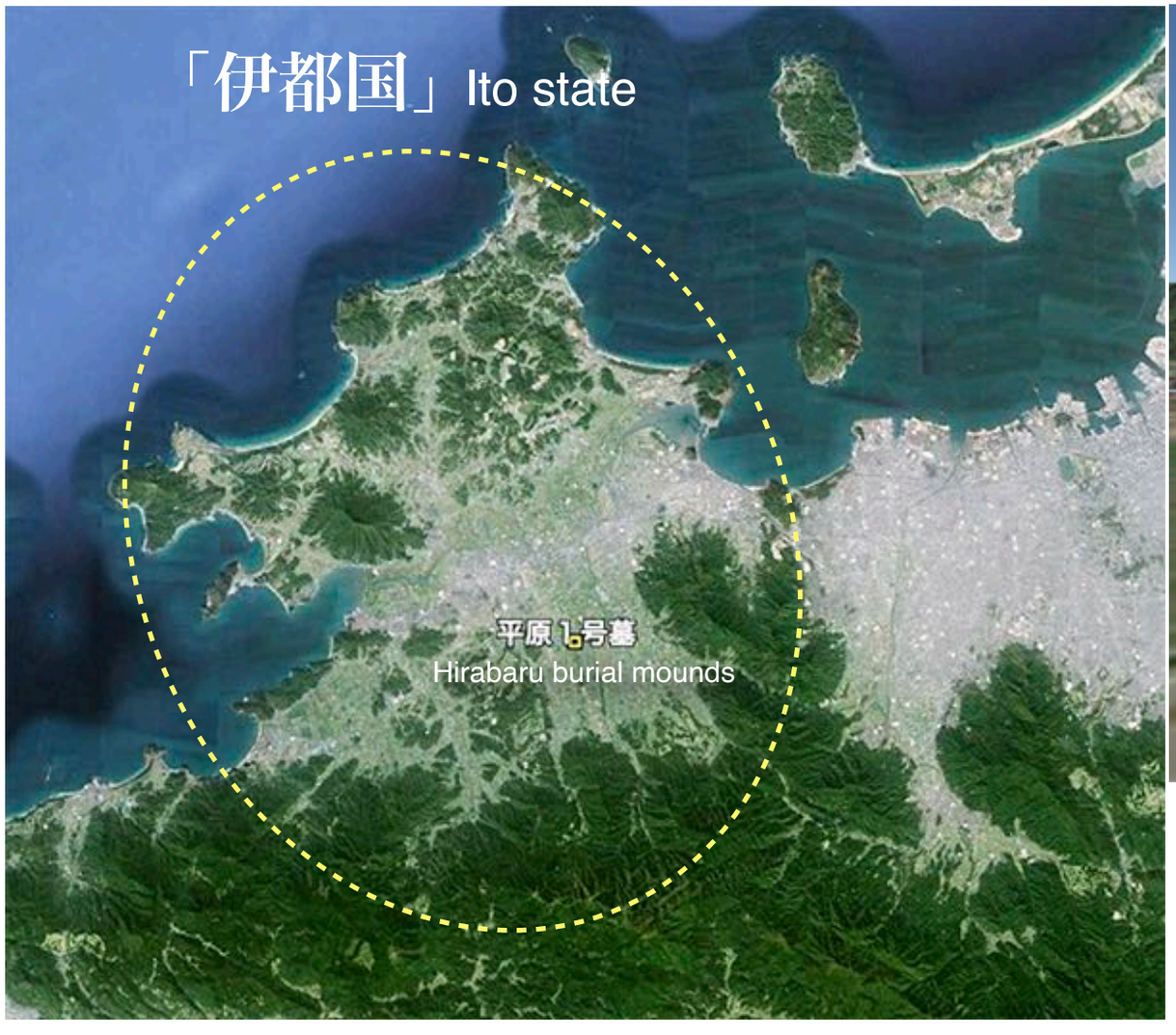


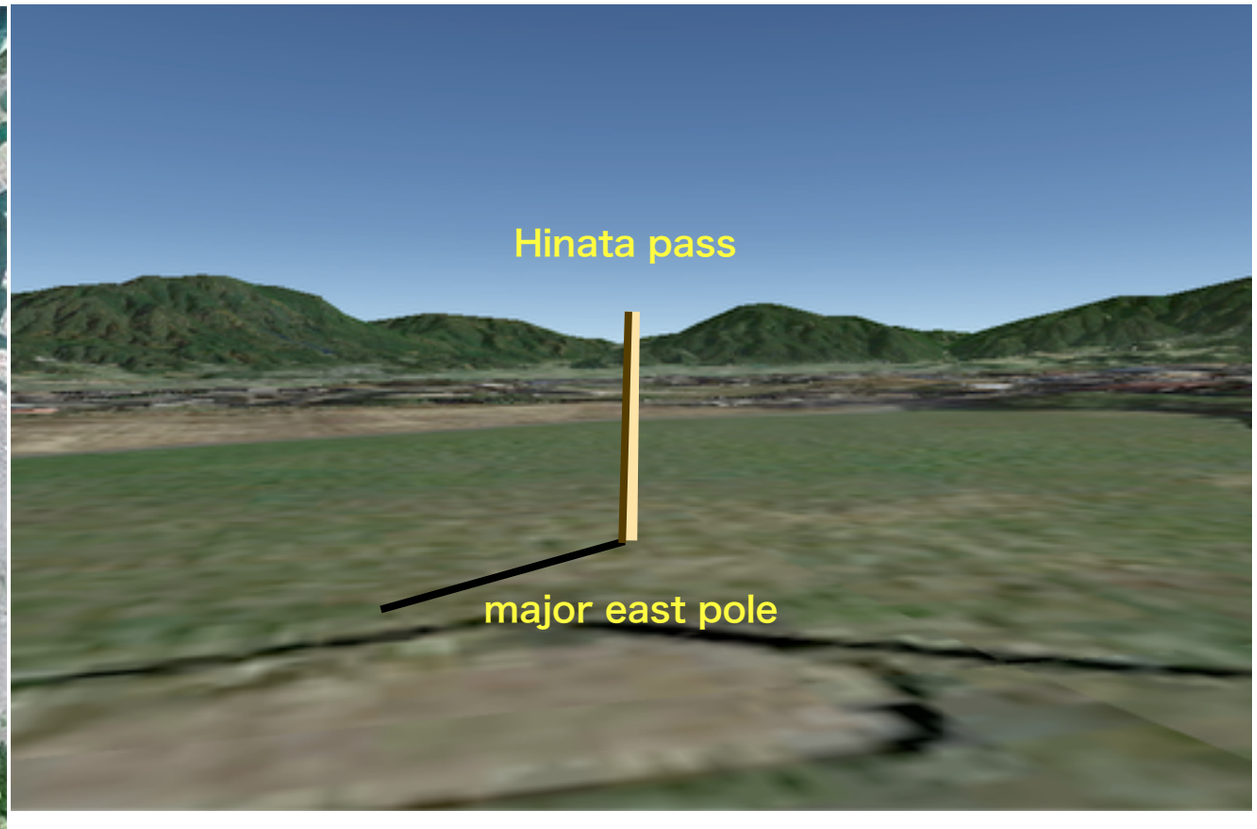
Possibility that a Chinese envoy observed the system of Sunrise Agricultural Calendar used in Ito state

An article in 「魏志倭人伝」showing where a Chinese envoy stayed in Japan in the 3rd century.

「常停伊都国」

"The envoys from Wei were always allowed to stay only in Ito state."



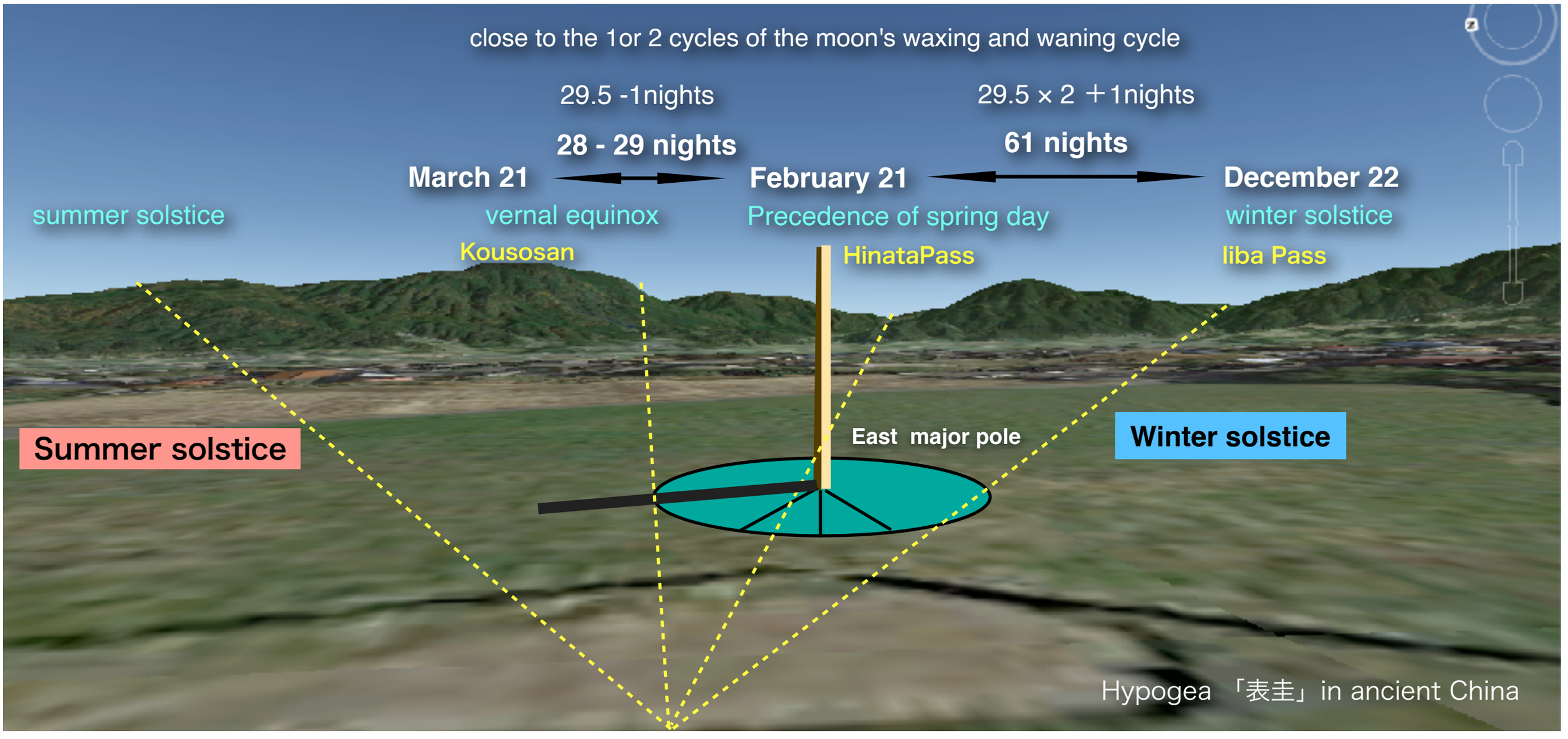


The Chinese envoy might have actually visited the Hirabaru burial mounds and observed the framework of the sunrise agricultural calendar. However, they overlooked the fact that the Yayoy people in those days recognized the summer solstice and winter solstice.

Final discussion

Could it have been accompanied by lunar observations?

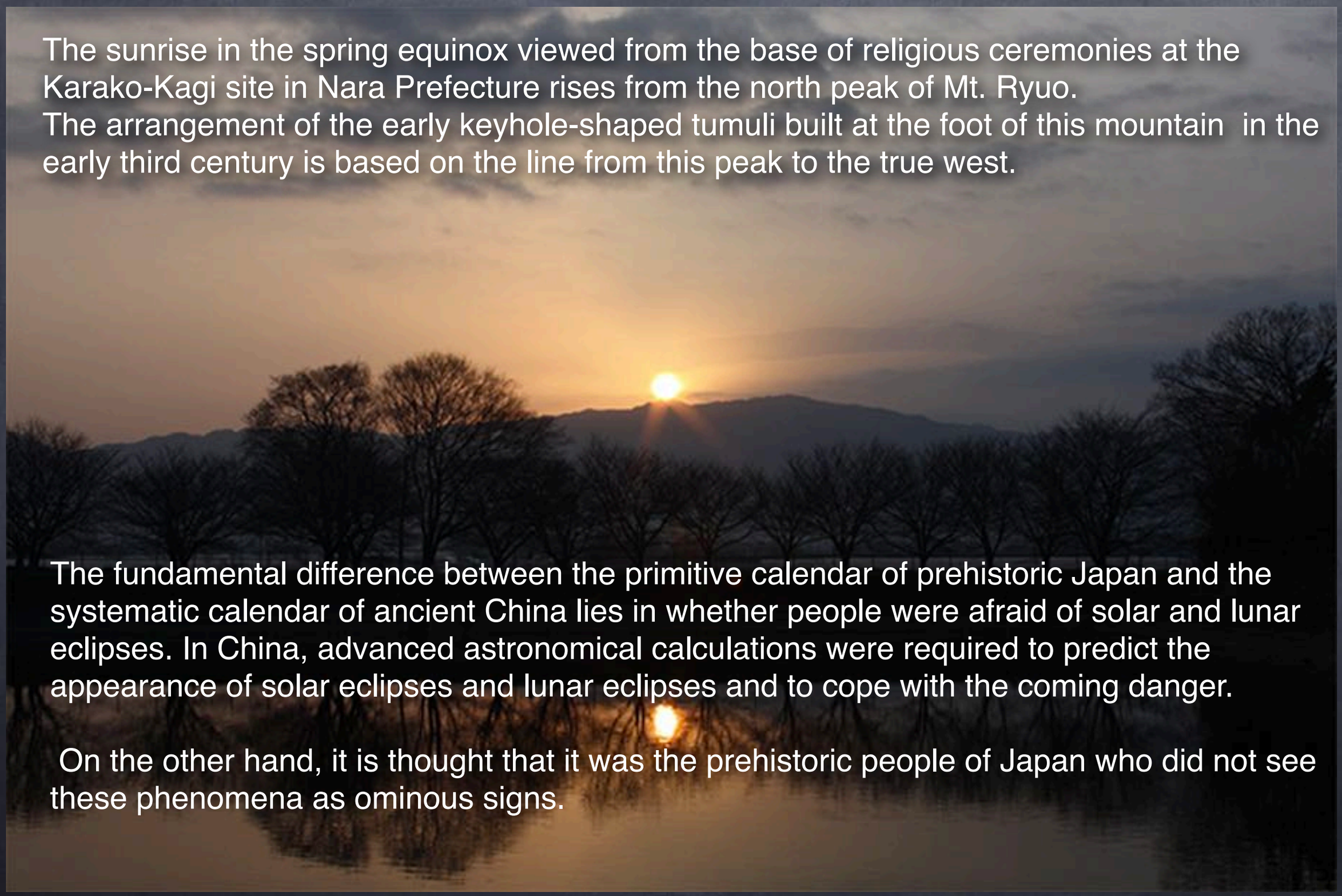
Is there any possibility that the azimuth memory was attached to the outer circumference of the east major pole?



If the azimuth memory was attached to the outer circumference of the pole, it would have been a complete almanometer. If it had been accompanied by observations of the phases of the moon, it could have been an advanced calendar.

The Prehistoric Society of Japan May Have Recognized the Vernal Equinox and the Autumnal Equinox by Combining Observations of the Sun and the Moon

The sunrise in the spring equinox viewed from the base of religious ceremonies at the Karako-Kagi site in Nara Prefecture rises from the north peak of Mt. Ryuo.
The arrangement of the early keyhole-shaped tumuli built at the foot of this mountain in the early third century is based on the line from this peak to the true west.



The fundamental difference between the primitive calendar of prehistoric Japan and the systematic calendar of ancient China lies in whether people were afraid of solar and lunar eclipses. In China, advanced astronomical calculations were required to predict the appearance of solar eclipses and lunar eclipses and to cope with the coming danger.

On the other hand, it is thought that it was the prehistoric people of Japan who did not see these phenomena as ominous signs.