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The Orientation of Kofun Tombs According to Saito Tadashi

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Saito Tadashi was a Japanese archaeologist and professor at Taisho University. He was born in 1908 in Hokkaido. After high schools, he started his studies at the Department of Japanese History of Tokyo University. Of 1932 it is his bachelor dissertation on Japanese ancient mortuary practices. From 1933 to 1940, he undertook surveys and excavations in the Korean Peninsula. After returning to Japan, Saito Tadashi worked in the Ministry of Education and Culture for more than a quarter century (1940–1966), conducting cultural heritage surveying of archaeological sites. In particular, he surveyed the orientation of many keyhole kofun. Japanese kofun are ancient burial mounds mainly constructed between the middle of the third century to the early seventh century CE. The term “kofun”, which means “ancient tomb”, is also used to indicate a period in the history of Japan, from about 300 AD to 538 AD, which is the year of the official introduction of Buddhism in the archipelago. The larger kofun have a very distinctive shape and are usually defined as keyhole-shaped mounds. The Japanese term is zempō-kōen fun, which means “square in the front and round in the rear”, according to the geometric layout of the two mounds composing the kofun. About kofun and their orientation, a large literature in Japanese exists. Of this literature we will stress the studies by Saito Tadashi. Regarding the orientation, let us note that the front of the kofun is the square part of it, as the name zempō-kōen fun is indicating, and that the direction of orientation is the direction which is facing the front of the kofun. Then, the orientation of the largest Japanese kofun, the Daisenryo kofun, is south-southwest. And in fact, there we find the Torii Gate. Considering the results of the studies by Saito Tadashi in 1950s, who looked at the orientation of 394 tombs of the Early and Middle Kofun periods (3rd to 5th centuries), we can see that many of them are facing the south and west directions. We will stress also the fact that there are two periods regarding the kofun burial chambers. In the first period we find vertical pits from the top of the mound to the burial chambers. In the second period, we find horizontal passage corridors. Therefore, the claim of a supposed orientation of kofun facing the arc of rising/shining sun, - that is, the orientation of their passage corridors to rising/shining sun (whatever it means) - is wrong because it is based on a supposed ubiquitous presence of a passage corridor which is not true. As we can find in literature, the orientation is given by the front side of the zempō-kōen fun, “square front, round rear”.

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Introduction

An image of the day (October 11, 2017), provided by NASA Earth Observatory (Patel, 2017), is showing an area in Japan, with some specific sites encircled. The largest one is the Daisenryo Kofun (alternately, Daisen Kofun). Kofun are large tombs formed by tumuli. Of the Daisen Kofun, Kasha Patel (2017) tells that it is shaped like a “keyhole”, however the structure is quite different from the keyhole tombs observed in the Sahara (Sparavigna, 2013, 2014, 2018). In Japan, this site and others, defined as keyhole-shaped kofun, consist of mounds, surrounded by moats (Fig. 1). The mounds are composed of two parts: the part in the front of the mound is of trapezoidal shape, the rear part is round, and the Japanese name of a keyhole-shaped mound is “zenpōkōen”, which means literally “**square front, round rear**”.



Fig. 1 - A large kofun as we can see from a Google Earth image, Many thanks to Google Earth.

In (Patel, 2017), it is said that Daisenryo Kofun is one of about fifty burial sites still intact today in the city of Sakai, near Osaka. “Each kofun (which means “ancient grave”) varies in size and takes different shapes - but most often keyholes, squares, or circles. Kofun were popular in Japan between the third and sixth century, which is referred to as the Kofun Period” (Patel, 2017). The image of the day from NASA is giving the Mozu-Furuichi Kofun Group. “The Daisenryo Kofun is the largest in Japan, but little is known about what lies inside. One glimpse came in 1872, when a severe storm damaged the site and revealed a treasure-trove of valuables from inside - helmets, glass bowls, and clay figures known as haniwa. Because kofun are considered sacred religious sites, further archaeological research was prohibited. Even today, no one is permitted to go beyond the bridge over the second moat!” (Patel, 2017).

Patel tells that further archaeological investigations on these kofun are forbidden, however

many archaeological studies exist, and evidence is provided by the large literature in Japanese on Kofun and Kofun Period.

On kofun and their orientation, a large literature in Japanese exists – see references in my <https://zenodo.org/records/14677142> -, such as some references about related archaeoastronomical studies too. Details about the burial chambers in the kofun having a keyhole-shape are given in <https://zenodo.org/records/14677142> . In some of them, the presence of two burial chambers inside is giving a direction coherent with the long axis of the tumulus. We also recommend the reading of two detailed discussions (in Italian), that have been provided by G. Poncini in the Enciclopedia dell' Arte Antica (1995) and M. Hudson about archaeology in Japan 2002.

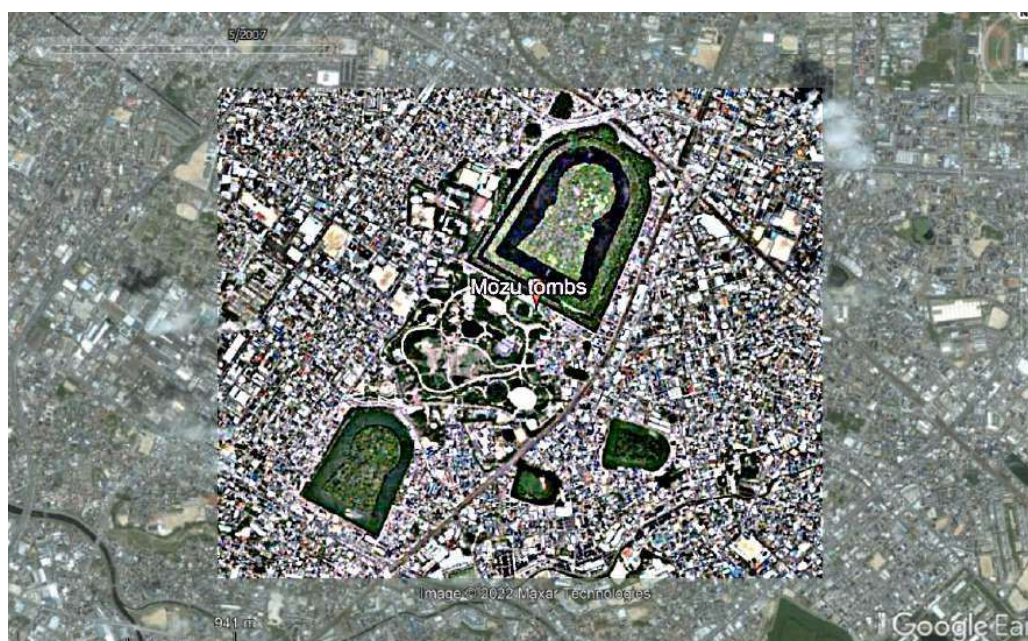


Fig. 2 – In (Patel, 2017) we can find an image provided by the NASA Earth Observatory, showing the group of the Mozu Tombs, with the largest existing one, the Daisenryo kofun. Here it is given the same group in a Google Earth satellite image, the central part enhanced by GIMP Retinex filter.

The study here proposed aims to investigate the orientation of the tumuli and find any possible reference to geomancy. Its main goal, however, is to remember the work made by Saito Tadashi regarding the orientation of these tumuli.

As given by M. Tomii, 2014, in the Encyclopedia of Global Archaeology, Saito Tadashi was a Japanese archaeologist and professor at Taisho University. He was born in 1908 in Hokkaido. After high schools, he started his studies at the Department of Japanese History of Tokyo University. Of 1932 it is his bachelor dissertation on Japanese ancient mortuary

practices. From 1933 to 1940, he undertook surveys and excavations in the Korean Peninsula. After returning to Japan, Saito Tadashi worked in the Ministry of Education and Culture for more than a quarter century (1940–1966), conducting cultural heritage surveying of archaeological sites. In particular, he surveyed the orientation of many keyhole kofun. Considering the results of the investigation by Saito Tadashi in 1950s, who looked at the orientation of 394 tombs of the Early and Middle Kofun periods (3rd to 5th centuries), we can tell that many of them are facing the south and the west direction. Moreover, we can also see that the quarter which contains the smaller number of tombs is the north-east one. In geomancy, the northeast quarter is particularly inauspicious, known as the "demon gate". In Japan, this gate is referred to as Kimon, meaning ominous direction, or taboo direction. For the orientation of kofun, as we will discuss, it is strictly necessary to understand what the main side of them is. Consequently, the direction that this side is facing is considered the orientation of the structure.



Fig. 3 - Nintoku-tenno-ryo Kofun in Google Earth Pro, that is, the Daisenryo Kofun (many thanks to Google). The structure has a symmetry axis (arrow), which is its main axis. The base (about 300 m long) of the trapezoidal part seems perpendicular to the main axis (about 490 m long). In the image we can see the Torii Gate (blue marker). “There are sacred areas indicated by Torii gates facing the tombs where individuals can worship or pay their respects. There is such a place at the front of the keyhole-shaped Emperor Nintoku Mausoleum (located at the southern end of the burial mound)” (from [livejapan.com](https://livejapan.com/en/in-kansai/in-pref-osaka/in-sakai/article-a2000228/))

Let us note that the main side of this mound faces south-southwest direction.

Orientation of zenpōkōen kofun (first part)

For what concerns the orientation of Kofun, those having the **zenpōkōen** shape, a detailed

discussion is given in (Goto, 2018). The main subject of this article is a short history of archaeoastronomy in Japan. This author, Akira Goto, and Yoshitaka Hojo have recently written an update in (Hojo and Goto, 2021).

For the astronomical orientation, the kofun burial sites differ from those of Sahara, which have an orientation to sunrise for sure (see Sparavigna, 2018).

Abstract of (Goto, 2018) tells that “Although the information about archaeoastronomy in Japan available to international audiences is limited, this does not mean that archaeoastronomy has never been attempted in Japan. On the contrary,” the article by Goto “shows that a variety of archaeoastronomical research has been done in Japan”. As evidenced by the large bibliography, many studies have been performed concerning the orientations of ancient burial sites.

Akira Goto (2018) in particular, examines the keyhole-shape mounds. He continues remembering the British engineer William Gowland too. “Kofun studies, which [William] Gowland [1897] pioneered and had been further developed by Japanese archaeologists, have found several types of burial mounds: rectangular, circular, keyhole shape (*square at the front and rounded in the rear*), squares both at front and in the rear type, and several others. The discussion [by Goto, 2018] examines the keyhole-shape mounds, whose construction started at the beginning of the Kofun Period (late third century) and contains many giant mounds that were likely royal tombs. ... I [Akira Goto] would like to mention that *the main axis of the burial mound and the orientation of burial chamber do not necessarily correspond. In some cases, burial chambers are lain at right angle to the main axis of burial mounds and there is a temporal as well as regional variation in their relationship* (e. g. Goto 1936; Kobayashi 1960; Shiraishi 1989; Hojo 2017 [see the references given in Goto, 2018]). Early researchers following Gowland continued to point out the regularity of burial orientation of Kofun mounds, namely eastern and northern orientation, according to the area. Although most of them recognized the particular orientation of burial mounds and burial chambers, researchers have proposed several different interpretations: topographical, symbolic, political, as well as astronomical. ... *One of the leading figures of Kofun studies from 1950–1970s was Tadashi Saito*, who suggested that the eastern orientation is similar to the custom of Shilla in the eastern part of the Korean Peninsula and northern orientation to Lelang Commandery in northern Korean Peninsula. Saito further argued that the eastern orientation was related to the worship of the Sun and that the northern orientation was the influence of Chinese Confucianism philosophy” (Goto, 2018).

Let us remember that William Gowland (1842 – 1922) was an English mining engineer who carried out archaeological work at Stonehenge and in Japan. He has been called the "Father of Japanese Archaeology".

According to Goto, 2018, early research has shown a regularity of “burial orientation of Kofun mounds, namely eastern and northern orientation, according to the area”. Goto considers an orientation as in Figure 3, where we can see the kofun having a north-northeast orientation. However, usually, the orientation of the tumulus is given considering the main side of the kofun. Then, in the case of Figure 3, the orientation of the kofun is said to be south-southwest (and there we can find the Torii gate, a traditional gate most found at the

entrance of a Shinto shrine, symbolically marking the transition from the mundane to the sacred space). Consequently, the eastern orientation mentioned by Goto is that of a tumulus facing west, the northern orientation is that of a tumulus facing south.

Akira Goto says that several different interpretations exist of the orientation of the tumuli: “topographical, symbolic, political, as well as astronomical. Topographic interpretations refer to the location of the mounds, such as at the mountain slope, ... Thus, the orientation of these mounds tends to accord with the direction of the slope” (Goto, 2018). Political interpretations of different orientations are linked to the different “social status of buried persons (Hojo 2017)”. Symbolic interpretations have related orientation to landscape features such as sacred mountains: “Symbolic interpretations have often been combined with astronomical ones”, and see the detailed analysis in (Goto, 2018).

Concerning kofun burial places in Kinai Area, central Japan (see also Hojo and Goto, 2021), in Goto, 2018, we find that researchers recognized “the *kita-makura* chamber orientation, which is literally translated as *northern pillow*. The northern pillow suggests that the dead was buried with his/her head orienting to the north. This is the same thing as what Gowland called *southern aspect, since the burial chamber is usually opened toward south*. Until today, Japanese customs believe that it is not good to sleep with your head to the north, since the northern pillow position is a custom reserved only for the dead” (Goto, 2018). “In his recent book, entitled *The Orientation of Kofun and the Sun*, Yoshitaka Hojo reanalyzed astronomical interpretations of Kofun burial orientations (Hojo, 2017). Using astronomical simulation and calculation, Hojo has convincingly shown that the burials characterized as *northern pillow* are mostly lain within a range of the circular movement of Big Dipper”. In (Goto, 2018), many references are given and here only those in English are reported (Goto, 2021, Goto, 2016, Hojo, 2017, Renshaw et al., 2000, Renshaw, 2015).

And, from (Goto, 2021), mentioning (Gowland, 1897), we find again: “To summarize, early Japanese researchers following Gowland continued to point out the regularity of the burial orientation of burial mounds, namely eastern and northern orientations, which varied by area. Although most of them recognized the particular orientation of burial mounds and burial chambers, researchers have proposed several different interpretations: topographical, symbolic, political, as well as astronomical”. Then, from the analysis of Akira Goto, we can tell that Yoshitaka Hojo has linked the orientation of burial chambers to the circumpolar movement of Big Dipper asterism. It seems to be also a shift of *kita-makura* to older times of Japan, before the advent of Buddhism.

Let us stress that when Goto writes “following Gowland continued to point out the regularity of the burial orientation of burial mounds, namely eastern and northern orientations”, it means that the front side of the kofun is facing west or south. That is, the orientation is west or south. And this is the result given by Saito Tadashi.

The orientation of kofun by Saito Tadashi

In an article by J. Edward Kidder, Jr., entitled “Makimuku, Himiko and Yamatai: Solving the Puzzle”, 2015, we can find several interesting information about the orientation of kofun. First, let us tell that the Makimuku ruins are ruins in Nara Prefecture Sakurai, near Mount Miwa, of the Yayoi Period. It is a site that began in the 3rd century. Some

researchers consider this area to be the birthplace of the Kofun system, that is the center of Yamatai country. Himiko is the queen of the Yamatai. Six ancient burial mounds such as Hashihaka Kofun, are distributed in the Makimuku area.



Fig. 4 – Many thanks to Google Earth, an image of which is showing the Hashihaka kofun (箸墓古墳), Sakurai City, Nara Prefecture, Japan (the black area above to kofun is water). Hashihaka kofun seems being the first large keyhole-shaped kofun constructed in Japan, associated with Yamato (Brown, 1993). Imperial Household Agency designates Hashihaka kofun as the tomb of Princess Yamato Totohi Momoso, daughter of Emperor Kōrei. A scholarly theory is proposing Hashihaka kofun as the tomb of Himiko, the queen of Yamatai. [Researchers in 2013](https://heritageofjapan.wordpress.com/2013/02/25/researchers-investigate-hashihaka-ancient-tomb/) conducted the first-ever on-site survey of the Hashihaka kofun (granted access by the Imperial Household Agency).

<https://heritageofjapan.wordpress.com/2013/02/25/researchers-investigate-hashihaka-ancient-tomb/>
*The name Hashihaka means "chopstick grave" and refers to the love between the Princess and the **kami of sacred Mount Miwa** (about 2 km East of the tumulus), which ended with the princess stabbing herself to death with a chopstick.*

In Edward Kidder's "Makimuku, Himiko and Yamatai: Solving the Puzzle", 2015, it is told the following. "To return briefly to the era prior to the Japanese adoption of the continental system of southern orientation [the Gowland's "southern aspect"] ... , the stage is particularly demonstrable in the construction of the early mounded tombs. Many of them, especially very large ones, are known as the zenpoko (square front round back) type, popularly known in English as "keyhole-shaped." **Saito Tadashi looked at 394 tombs of the Early and Middle Kofun periods** (3rd to 5th centuries), including excavated smaller round mounds in which the direction of the burial chamber had been determined, separating these as built on hilly and level terrain (Saitō, 1953, 1961)". Edward Kidder continues: "The perplexing question has always been the **extreme randomness of their orientation**. Was there a system, such as facing the sun at certain times of the year, facing the residence of the deceased, facing a tomb of a revered ancestor, and so on? Were there regional differences and/or time differences in the first half of the Kofun period? **Early ones, occasionally**

formed by cutting off the tail of a hill, naturally followed its direction. The orientation was then uncontrollable, and some scholars think this may have fixed an attitude that *direction was not significant, but only size.* The study includes 135 tombs on hilly terrain and 259 on level ground as indicated on the chart. In the entire group only WSW has no tomb facing it [hilly terrain], but several other directions have only one. The point here is that, although the cardinal directions are generally preferred and south is obviously used more for level ground, even south has only 88 tombs (22%). *South has the highest percentage, but it is rivaled by west with 76 (19%). Japanese folklore contains many stories of protecting houses, palaces, temples, castles and even cities from the hostile spirits that attack from the north, the classic example being the Enryaku-ji for the city of Kyoto.* Twenty tombs face north. Saito says there can be only one explanation: the Chinese principle of southern orientation had not yet been introduced". (Kidder, 2015).

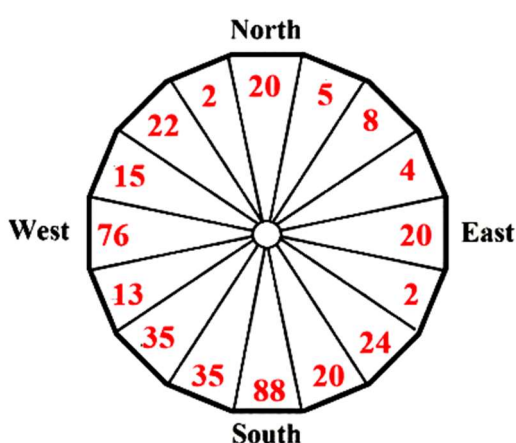


Fig.5 (a): Orientation of kofun according to Saito Tadashi (Kidder, 2015).

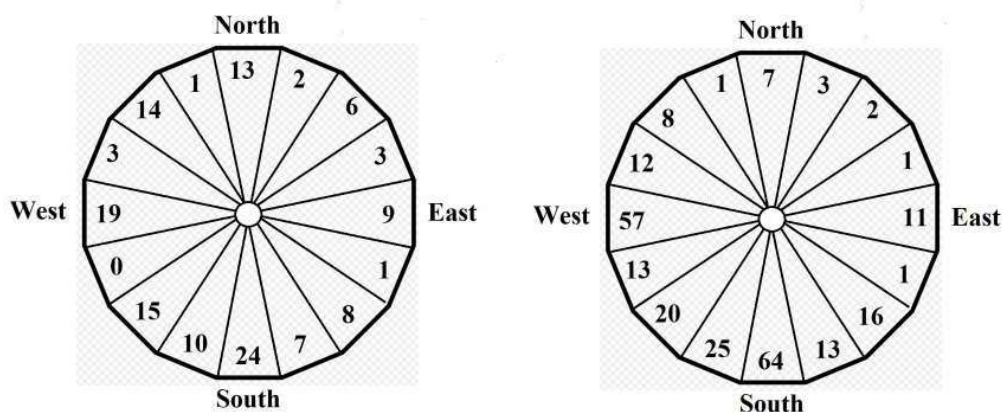
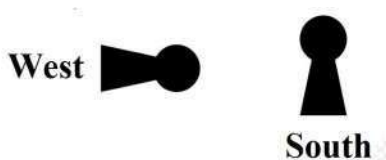


Fig. 5 (b) - Orientation of keyhole tombs, as given by Saito's data, in (Kidder, 2015). Left: hilly terrain; right: level terrain. In (Kidder, 2015), it is told that they are the orientations of "keyhole-shaped tombs and burial chambers of excavated round mounds". However, in (Kidder, 2007), the same author says that they are keyhole tombs. About the round mounds,

Kidder provides further data (see Section “Divination and Geomancy”). In the arc from west to south (inclusive count), there are 179 keyhole tombs (69%) as told in (Kidder, 2007). According to the compass rose in (Kidder, 2015), in the remaining part of the rose, we find 75 tombs, for a total of 254, instead of 259 (probably a misprint in <https://icu.repo.nii.ac.jp/>, page 11, or in the text, or in Saito’s text; the percentage is passing from 69% to 70%).

https://icu.repo.nii.ac.jp/?action=repository_action_common_download&item_id=4211&item_no=1&attribute_id=22&file_no=1



For the keyhole-shaped tombs, as we have already told and as will see in the following discussions, the direction is that faced by the square side of the kofun. For instance, in the figure on the left, the kofun on the left is facing West, that on the right is facing South.

Edward Kidder’s point of view “on the randomness is that it was actually a calculated concept at this stage. It was in keeping with the prevailing practices in a world intimidated by malignant spirits which had to be beseeched and placated”. Kidder had “interpreted Himiko’s form of magic called kido as controlling the spirits of the dead. Spirits were known to be robotic routine followers (hence not retracing one’s steps at a funeral), moving in straight lines (hence spirit screens), unable to cope with inconsistencies and sudden changes. In other words, randomness confused them and neutralized their inimical intentions” (Kidder, 2015).

Divination and Geomancy

From the same author, J. Edward Kidder, we can have further information (Kidder, 2007). “The differences between a diviner and a geomancer were murky ... While there is no consensus on whether the idea of the mounded tomb was borrowed from abroad or evolved locally from Yayoi humped-up graves, if the former, geomancy should have come with it, thus making the geomancer a part of the initial process of sitting the grave and timing the funeral and burial” (Kidder, 2007).

“The great majority of the tumuli are round, but the keyhole shape and direction of the burial compartment seem to have lent themselves to some kind of planned orientation ... The orientation of keyhole is so conspicuously haphazard it has defied explanation. ***Suenaga says the problem was initiated by shaping early tombs out of hill ends, therefore guaranteeing a limited choice of direction. By default, direction was not thought to be important.*** In a sense this may be true, but when the choice for orientation became unlimited after the largest keyhole were built on level ground, it seems inevitable that certain directions would take preference” (Kidder, 2007).

“It is inconceivable to me [Kidder] that orientation was not an important factor if both the location and the timing were significant. Professionals had made their geomantic duties into an influential business from a very early date in China, and orientation had become an important feature of the whole mortuary system. Suenaga went on to say he believed a tomb like Emperor Nintoku’s on the Sakai Plain “faced” his palace in Naniwa, by which is meant the round knoll is pointed in that direction. This may work in his case, but it was not a

principle, as the tombs attributed to most ruler have no such relationship. One can even argue which is the “front” and which is the “back” of such mounds” (Kidder, 2007).

Let us stress that the Japanese term means ‘square front, round rear’.

Another comment is necessary. As we have shown in the detailed discussion, <https://zenodo.org/records/14677142>, using elevation TessaDEM maps, keyhole tombs that appears, in the satellite imagery, to have been built on level ground were instead built on a surface with a non-flat elevation profile.

“I [Kidder] believe it was actually a calculated randomness, which seems to be the closest to the geomantic thinking of the time. It takes as its premise the inability of malevolent spirits to deviate from the routine and therefore to be confused by diversity. In effect, the alignment of tomb mounds and burial chambers on different axes neutralized the influence of the evil spirits” (Kidder, 2007).

Then we find again, in the given reference, the data by Saito.

“The orientation of 394 keyhole tombs was tabulated by Saito Tadashi with some comment on their randomness [then, we find 394 keyhole tombs]. By and large, these are early- and middle- period tombs. He separated them by terrain: mounds built on plains or plateaus where choice of direction was seemingly unhampered, and mounds built in hilly areas where the topography was an influencing factor. Both groups show a preference for the cardinal directions, but in the upland terrain none of the four quadrants was overwhelmingly preferred (NE 11; SE 16; SW 25; NW 18). Among the 259 flatland tombs, by far the largest number lie in the southwestern arc of the compass, and if the two adjacent points are included, they constitute 179, or 69 percent, of the total. With the exception of due east and to a lesser extent due north, the wide, roughly 200- degree northeasterly arc from north-north-west to south-south-east [actually, east-south- east] was generally avoided (only 26 to 10 percent).” (Kidder, 2007)

“Saito also listed 93 round or square tombs, chiefly of the early and middle periods, for which the axis of the internal structure is known. Rough uniformity is arrived at only in the later stone passageway and chamber tombs, most of which open towards the south, so the question concentrates on burial before that time. ... For 43 the axis is east-west, for 34 it is north-south, for 6 it is southwest-northeast, and for 20 it is northwest- southwest. Therefore, one sees the cardinal points again as first choice and beyond that, where the direction of the head could be determined, the largest number were pointed toward the east or north” (Kidder, 2007).

“The question is then asked by all Japanese: why the east and north? North is taboo, especially in regards to one’s bed. Evil spirits still attack from the northeast, and various ingenious forms of protection have been devised over the centuries to protect individual residences, temples, castles, and even cities. ... A simple answer is that the taboo arrived in Japan later. *Saito found that orientation of the burial with north or east during the Jomon and Yayoi periods was not uncommon, so he believed that the random tradition was well entrenched with no special stigma attached to directions.* A high percentage of Jomon and Yayoi houses were entered from the general direction of the south, but it looks as though no psychological connection was made between residence and grave until the later part of the fifth century” (Kidder, 2007).

Kita-makura

Akira Goto is mentioning the kita-makura (northern pillow) burial chamber orientation. The northern pillow suggests that the dead was buried with his/her head orienting to the north. Let us better understand the kita-makura.

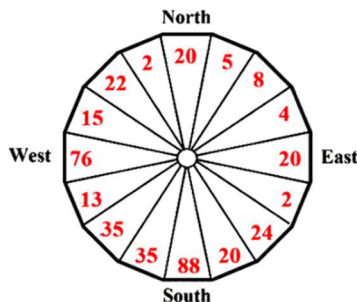
From the book on the Japanese Rinzai Zen Buddhism, by Jørn Borup, 2008. “He/she is dressed in a pilgrim’s outfit, the journey of death being the final religious pilgrimage, and pilgrimage itself being a principal recurrent symbolic journey toward death. The body of the deceased is to be placed beside a folded screen erected upside down to protect against malevolent spirits, with the head pointing toward the north (kitamakura) – a ritual based on the legend of Buddha. The hands must be folded in gasshō position, and the head covered by a white piece of cloth, just like the kamidana should be concealed with a white paper (kamidana fuji) when announcing the death to the ancestors in the butsudan. The “pillow decoration” (makura kazari) is a small table covered by a white cloth, with offerings consisting of flowers, incense, a lighted candle, a bowl of cooked rice, and water”. “The practice of gasshō (合掌), pressing one's hands together in prayer, is said to come from Zen Buddhism and is a gesture used throughout Asia as a sign of reverence or greeting” (from www.jas-hou.org).

“Buddha died with his head turned to the north, his feet to the south, his face to the west and his back to the east. A dead body will be laid in a way called Kita-Makura or north-pillow, with its head turned to the north, and few Japanese will sleep lying in that was at ordinary times” (from Atsuharu Sakai, 1949).

It is told that, officially, Buddhism was introduced in Japan at the end of Kofun period. Then, we must consider the Kofun period before the introduction of Buddhism.

According to the “Funeral Rites”, in the discussion by Arthur Hyde Lay, entitled “Japanese funeral rites”, published by the Transactions of the Asiatic Society of Japan, 1891, about the kofun tumuli it is told that “As regards the materials used and the manner in which they were put together, we gather from the Shoryoshiki that a foundation was laid of small stones which were rendered cohesive by lime and then beaten into a compact mass and allowed to dry. Upon this basis was placed the stone receptacle, *care being taken to lay the coffin in such a position that the head of the corpse should be towards the North*; and above were laid three or four large stone slabs”. Therefore, the research by Hojo and Goto on the astronomical orientation of the burial chambers and sarcophagi is fundamental to have further insight into the religion of Kofun period too.

Fig.5(a)



Let us consider Figure 5 previously proposed, showing the orientations of keyhole tombs, given by Saito’s data, in the article by Kidder, 2015, with remarks in Kidder, 2007. We can see that there is a quarter which contains the smaller number of tombs facing the directions within it. It is the north-east one. In geomancy, the northeast quarter is particularly inauspicious, because of one direction, known as the "demon gate". In Japan, it is referred to as Kimon,

meaning ominous direction, or taboo direction. “Geomancy, known in Japanese as kaso and derived from the Chinese feng shui, has been practiced here for centuries, and was used in the building of two early Japanese capitals in the 7th and 8th centuries.” (Coleman, 1998).

In the “Japanese Religions: Past and Present”, by Reader, I. et al. 1993 it is told that “Another area of folk religion that continues to influence the lives and practices of many Japanese is a concern with divination and with lucky and unlucky days and directions, ... Fortune-telling and divination played a major role in Japanese life in earlier ages, with oracles consulted before undertaking new projects, and with diviners consulted about the correct day to start an enterprise or the best possible position in which to build a house. Many Japanese still take note of these things. Before building a new house, or before moving elsewhere it is common to consult a diviner to make sure that the propose orientation of the house will not be unlucky. Certain directions (in particular the north-east, known as the kimon or ‘devil’s gate’) are especially unlucky and are avoided. Similar consultations take place when building a grave, for sitting it facing an unlucky direction is believed to cause distress to the spirits of the dead and prevent them reaching a state of peace” (Reader et al., 1993).

The geomancy is used today as evidenced by an article in Los Angeles Times, author Joseph Coleman. The article has the following title “Using Stars, Calendar and Compass, Geomancers Keep Devil at the Gate”. And the Gate is the Kimon. This title is particularly relevant, because of the reference to the calendar. To have more information we can see Leslie Williams, E. (2007). The author tells that in Yin-Yang Five Phase cosmology, earth plays a central role as the medium of change in the annual cycle. “Each of the four seasons corresponds to a separate phase and to one quarter of the cycle: spring to wood, summer to fire, autumn to metal, and winter to water. Earth is the center position of the cycle”.

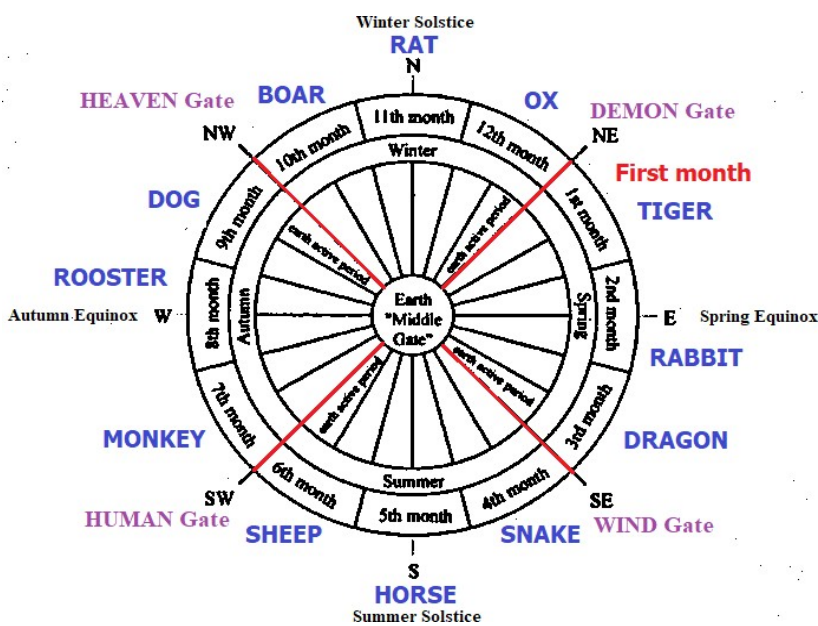


Fig. 6 – Here a figure according to Fig.4.8 from Leslie Williams, E. (2007). Note that the first month, and therefore the beginning of the year, corresponds to the Demon Gate. Let us note that the symmetry axis of the Daisenryo Kofun is NOT in the Demon Gate direction. This Kofun is FACING the SSW diction.

“Earth active periods of seasonal transition are significant calendrical projections of the Feminine archetype and the Great Mother herself. These earth active periods are called “gates” (mon). All four gates are recognized as interstices of power in time and space, as portals of contact with spirits, both the generative and devouring aspects of the Great Mother. The four gates are: the Demon Gate, the Wind Gate, the Human Gate (or the rear Demon gate) and the Heaven Gate. The gate at the end of each active period marks the beginning of a lunar calendar season”, as told by Leslie Williams, E. (2007).

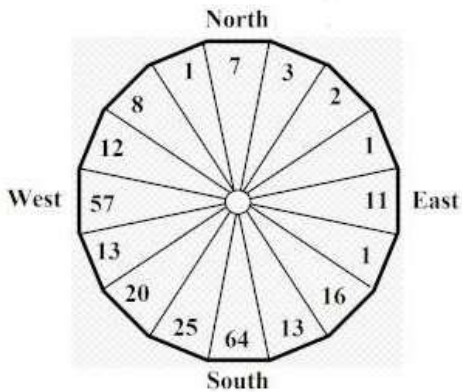
About the Demon Gate, Leslie Williams tells that the first earth active period occurs at the transition of winter to spring, at the northeast quadrant of the compass; it is known as the Demon gate (Japanese kimon). The Demon Gate is an interstice indicative of the devouring Feminine archetype and is the most potent yin interstice of the calendrical cycle”. The temporal gate is occurring at the New Moon of the Lunar New Year. It is an “ambiguous, dark phase of the moon”, a merging of old and new. Leslie Williams is also telling that the “ambiguous term” demon (ki; oni) denotes “spirits of the dead”, including “ancestral spirits”, and “invisible yin spirits” that “bring misfortune and harm to humans” (Leslie Williams is mentioning Ogawa, 1986).

“The Demon Gate is manifest in both time and in space. The Book of the Changes identifies the first trigram, “the Opposing,” that corresponds to the Demon Gate as being analogous to “mountain”, “stones”, “roads”, “doors and openings”, “fruits and seeds”, and “doorkeepers” (Baynes 1967; 278-79)” (Leslie Williams, 2007).

“Here a profusion of transitional, interstitial images is presented. In terms of remnants of Yayoi period ritual practice, mountains (and stones) are powerful interstices for spirits and the ancestral dead. Roads and crossroads have been previously identified as haunt of spirits and ghosts. Doors, gates, and openings are interstices pure and simple, regions at which opposites meet; keepers of these places are at the source of power. In addition, these places of physical transition delineate the spatial aspect of the Demon Gate juncture in the time/space continuum. Similarly, fruits and seeds embody the “beginning and the ends of plants (Baynes 1967), In these images, the merging of beginning and end is presented (see Ômori 1993), as in the Uroboros figure devouring its own tail and the yin-yang dyad; the process of change, as both life-taking and life-giving, is depicted. The Demon Gate is emblematic of earth, which together with woman makes up the Feminine archetype. The Demon Gate is literally death (Noguchi 1994) and burial of the dead in the earth.” (Leslie Williams, 2007).

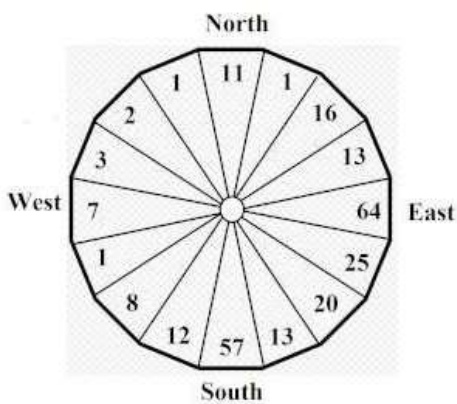
Leslie Williams is mentioning the Yayoi period, which is the period before the Kofun period. We find that the Demon Gate seems to be the remnant of Yayoi rituals.

In the following discussion, let us consider again Figure 5, and the Saito’s data for level terrain.



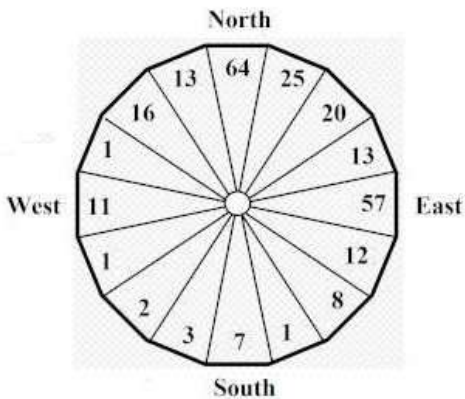
Rotation

Here again, we can use Saito's data, to stress the observation made by J. Edward Kidder, about the front and back of the kofun. That is, are we sure about the front in the square part? It is so, according to Saito.



In fact, Saito considered the orientation as in the upper panel in the image.

We could rotate it by 90 degrees (middle panel) or by 180 degrees (lower panel), counterclockwise.



Of course, if we rotate the axis, we pass from 64 kofun in the South direction, to 64 kofun in the East direction, and, with the further rotation, to 64 kofun in the North direction.

We have two directions (yellow and blue) along the symmetry axis of the kofun, which are the most natural to consider.

These directions can be easily distinguished by considering the square or the round part as the "front" of the tomb.

Saito Tadashi considers the orientation as in the UPPER panel.

For what regards the intermediate 90 degrees rotation (orange), it is problematic; what is the "front" in this case? Moreover, we could also assume a rotation of 270°, and then we can have 64 kofun in the West direction too.

As told by Akira Goto, we have that “several different interpretations [exist]: topographical, symbolic, political, as well as astronomical” for Kofun orientation. In the case of the topographical interpretation, satellite DEM maps are fundamental.

Orientation of zenpōkōen kofun (second part)

Let us consider two examples of kofun. We can see them in Figures 7 and 8. Trees and vegetation have been removed from the surfaces of the mounds, because of their restoration. In fact, *the real appearance of a kofun was that of an artificial structure, an evident man-made structure, and not of a natural hill.*

What is the orientation we can measure by means of satellites? As we did (Sparavigna, 2013, 2014, 2018) for the Sahara keyhole tombs, we can measure the orientation of the long axis of symmetry. Here we give an example:



Small

There is a ‘passage’, which is facing east. But kofun are different. There is not a ‘passage’, but a square front characterized by the Torii gate. One could tell that Torii gates are not of kofun period, BUT they are traditionally used to distinguish a sacred space from the profane one. And kofun are sacred spaces. The Daisenryo kofun faces south-southwest. NOT the sunrise. And there is NO corridor (see further discussions).



Huge

Here compass directions:

Name	Degrees, minutes	Decimal degrees	Name	Degrees, minutes	Decimal degrees
north	0° 00'	0.0°	south	180° 00'	180.0°
north-northeast	22° 30'	22.5°	south-southwest	202° 30'	202.5°
northeast	45° 00'	45.0°	southwest	225° 00'	225.0°
east-northeast	67° 30'	67.5°	west-southwest	247° 30'	247.5°
east	90° 00'	90.0°	west	270° 00'	270.0°
east-southeast	112° 30'	112.5°	west-northwest	292° 30'	292.5°
southeast	135° 00'	135.0°	northwest	315° 00'	315.0°
south-southeast	157° 30'	157.5°	north-northwest	337° 30'	337.5°

Courtesy <http://tamivox.org/dave/compass>

In Fig.7, from Google Earth Pro, we can see the Aotsuka Kofun.

“The Aotsuka Kofun (青塚古墳) is a Kofun period burial mound, located in the Aotsuka neighborhood of the city of Inuyama, Aichi in the Tōkai region of Japan. It was designated a National Historic Site of Japan in 1983. It is the second largest kofun found in Aichi Prefecture after the Danpusan Kofun in Nagoya.”

The item wikipedia.org/Aotsuka_Kofun is also telling that “The tumulus is a zenpō- kōen-fun (前方後円墳), which is shaped like a keyhole, having one square end and one circular end, when viewed from above. It has a total length of 123 meters and *is orientated to face southwest*. It consists of a three-tiered posterior circular portion with a diameter of 78 meters and height of 12 meters, and a two-tier trapezoidal anterior portion, with a width of 62 meters, length of 45 meters and height of seven meters. The tumulus was formerly covered in *fukiishi* across its entire surface, and had rows of cylindrical and drum-shaped *haniwa*. It is believed to have been built in the middle of the 4th century in the early Kofun period.” wikipedia.org/Fukiishi tells that “Fukiishi (葺石 or 葺き石 "roofing stone") were a means of covering burial chambers and burial mounds during the kofun period of Japan (c. 250–538). Stones collected from riverbeds were affixed to the slopes of raised kofun and other burial chambers. They are considered to have descended from forms used in Yayoi-period tumuli. They are common in the early and mid-Kofun periods, but most late Kofun-period tumuli do not have them.” The Aotsuka site of the kofun is open to the public.



Fig. 7 - Two axes and the meridian direction. **The kofun is facing south-southwest** (see please <http://tamivox.org/dave/compass>)

If we consider the orientation of the long axis, we find an azimuth of 33° (from the meridian line), between north-northeast and north-east. Therefore, we can find *an orientation towards the Big Dipper*, as those observed by Yoshitaka Hojo and Akira Goto, in 2021, for the long axis of the burial structures (see, Hojo and Goto, 2021; the orientation of the burial chambers have been considered). If we measure the eastern direction of the side of the trapezoidal front, which represents an axis perpendicular to the symmetry axis, we find an azimuth of about 121°. In this case, the direction of this side is towards the sunrise, but is this the solar orientation that we could consider? Or is it the opposite one, towards the sunset, that we must measure? Let us stress that it remains the fact that the square side, the main side of the kofun, is *facing south-southwest*.

北鮮 <i>North Korea</i> hokuchō	南北 <i>North-South (civil war)</i> nanboku
北進 <i>advancing north</i> hokushin	北京 <i>Beijing, Peking</i> pekin
北空 <i>northern skies</i> hokuten, kitazora	台北 <i>Taipei, Taiwan</i> taipei
北洋 <i>northern seas</i> hokuyō	北上中 <i>proceeding north</i> hokujōchū
以北 <i>north</i> ihoku	北朝鮮 <i>North Korea</i> kita chōsen
華北 <i>northern China</i> kahoku	北向き <i>facing north</i> kitamuki
北側 <i>northern side</i> kitagawa	西北西 <i>west northwest</i> seihokusei
北風 <i>northern winds</i> kitakaze	東北東 <i>east northeast</i> tōhokutō
真北 <i>directly facing north</i> makita	北回帰線 <i>tropic of cancer</i> kitakai kisen

北枕で寝る *sleep facing north* **kitamakura de neru**

From the Kanji Handbook, by Vee David, 2013

Following Akira Goto, (2018), we have to consider the orientation of the burial chamber inside, to see if we have a “northern aspect”, in the case the chamber is aligned in the same direction of the symmetry axis, or an orientation towards the sunrise or the sunset, if the chamber is aligned perpendicular to the axis. Then, only an investigation inside the kofun can determine the relevant direction. About sunset, let us remember that “the dead person’s head is turned to the north. If the body cannot be headed to the north for a certain reason, it may be turned to the west” (<https://osoushiki-plaza.com/eng/eng3.html#5>).

Let us now consider for comparison the [Hiruiōzuka Kofun](#) (昼飯大塚古墳). It is a kofun burial mound located in what is now part of the city of Ōgaki, Gifu in the Chubu region of Japan. The site was designated a National Historic Site of Japan in 2000. If we consider the **orientation of the long axis**, we find an azimuth of 55° (from the meridian line). Therefore, we can find an orientation towards the rising of the moon, on a ***northernmost lunar standstill***, as mentioned in (Hojo and Goto, 2021). If we consider the direction of the **side** of the trapezoidal front, which represents an axis perpendicular to the symmetry axis, we find an azimuth of about 145°. ***In this case, the “square” side of the kofun is facing the sunset.*** If we consider the **pathway** on the kofun, we find about 141°.

Fig. 8 (a) - Hiruiōzuka Kofun in Google Earth Pro. Many thanks to Google.

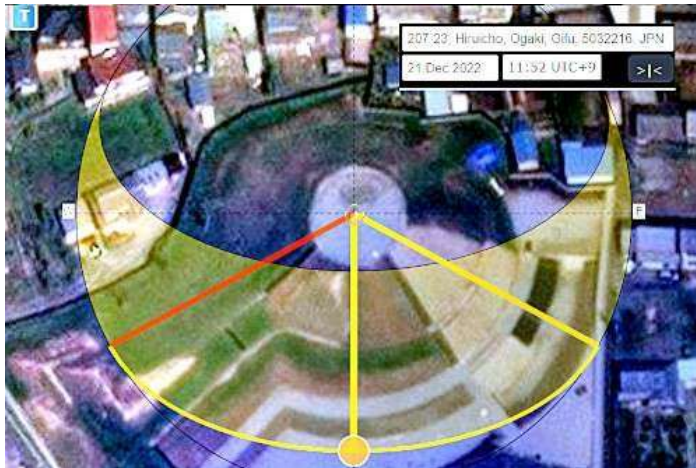


Fig. 8 (b) – Many thanks to [suncalc.org](http://www.suncalc.org). The lines represent the direction of the sunrise, noon and sunset on the winter solstice.

In the previous image (Fig.8 b), we can see a simulation obtained by means of [suncalc.org](http://www.suncalc.org): <https://www.suncalc.org/#/35.3876,136.5715,19/2022.12.21/11:50/0/1>. The figure shows the motion of the sun on a local astronomic horizon, from sunrise to sunset, on the winter solstice. Using the following link, the summer solstice is simulated (many thanks to [suncalc.org](http://www.suncalc.org)): <https://www.suncalc.org/#/35.3876,136.5715,19/2022.06.21/11:55/0/1>

In the case that we use the trapezoidal base or the pathway on the mound, ***the direction is not in the arc of the sunrise***. In any case, following Akira Goto, 2018, this kofun seems being characterized by a “southern aspect”. However, we could distinguish the orientation of keyhole kofun according to the arcs of sunrise, noon, sunset and north (hinotate, kagetomo, hinoyoko, and sotomo).

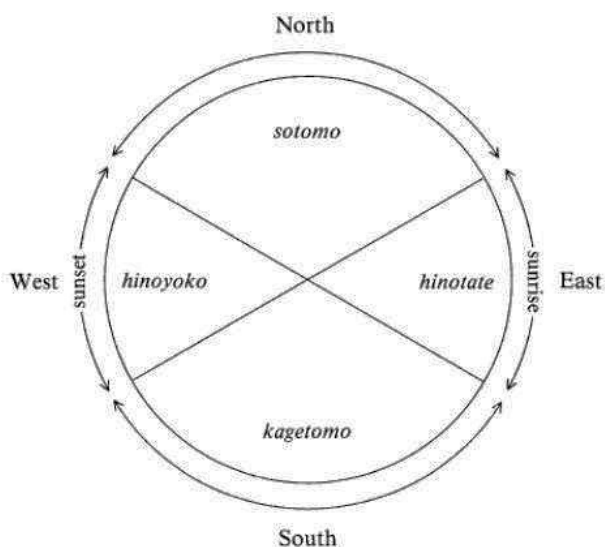


Fig.9 - From page 80 of Palmer, 1991. “For the ancient Japanese, the directions of sunrise and sunset were east and west, with the solstices indicating the extreme points, and the changes on these days formed the norm for orientation”.

However, how is the kofun inside?

About Hiruiōzuka Kofun, Wikipedia tells the following. “The tumulus is a three-tiered structure, *orientated to the southwest* and has an overall length of 150 meters. The bottom tier of the structure and its surrounding moat are now underground due to generations of agricultural activity in the area. ... It was first excavated in 1980 by Nagoya University and was found to contain *three separate burial chambers, one with a stone sarcophagus in the north, one with a clay sarcophagus in the south and one with a wooden coffin in the west*. The stone sarcophagus had been looted in the Meiji period, and the clay sarcophagus was not excavated. The burial chamber with wooden coffin was found to contain many grave goods, including iron and steel swords, tools made from iron, along with jade balls, magatama, glass ornaments and Haji ware pottery fragments. The inside of the coffin was not excavated. Haniwa recovered from the site was in various forms, including cylindrical-shaped haniwa, and haniwa in the shape of houses, human figures and in the form of tools and shields” (Isomura Yukio and Sakai Hideya, 2012).

“The kofun has been restored to what archaeologists believe to be its original appearance, covered in fukiishi with haniwa and the moat was also restored, forming an archaeological park”. Wikipedia is also giving measurements of the kofun.

Due to North, facing South

In Hojo and Goto, 2021, page 92, we can see that, of the considered 31 kofun in the Kinki area, 26 have the burial chambers oriented towards the circumpolar stars and the Big Dipper (see the diagram in Hojo and Goto, 2021). If we consider a perpendicular axis, of course, we can find a sunrise orientation, but it is the “northern aspect” dominating the structure.

From (Goto, 2021), page 78 (see the figures in page 79). “In his recent book, *The Orientation of Kofun and the Sun*, Hojo Yoshitaka reanalyzed astronomical orientation of kofun burial orientation (Hojo 2017). Using astronomical simulations and calculations, Hojo has convincingly shown that the burials characterized as “northern pillow” are mostly laid within a range of the circular movement of the Big Dipper. Since there was not a conspicuous “polar star” during the third to seventh centuries, Hojo has proposed a hypothesis that ancient people observed the circulation of the Big Dipper” or that people observed crossing the meridian of Dubhe or alpha-Big Dipper and possibly Alkaid or eta-Big Dipper. A simulation of the Big Dipper in the direction of the Ishizuyama Kofun, the third largest burial kofun in Japan, is also given in (Goto, Akira, 2021). The Ishizuyama Kofun has coordinates 34°33'14"N13, 5°28'38"E, south of Daisenryo Kofun.

Let us consider now a kofun having its axis in the precise meridian direction. It is the Shionjiyama Kofun, a mausoleum grave in Yao, Osaka (see Fig.10). From the web site kansaiculture.blogspot.com : “In eastern Osaka, along the edge of Mt. Takayasu (Shigi-san, where the well-known mountain-top temple is located) there are a series of ancient burial mounds in an area known as Naka-Kawachi. The largest of these is the Shionjiyama Kofun”. This zenpōkōen kofun is 160m long. Archaeologists have uncovered “artifacts such as armor, mirrors, clay figures ceremonial burial goods (such as clay houses). Replicas of such period ceramics line the pathways atop the restored exterior surface of the kofun”. “In

addition to the large kofun of Shionjiyama there are also a number of small tombs scattered around the neighboring mountainside; the temple of Jinkoji has a dense trail of them leading up toward Shigi-san. The Jinkoji tombs have similar construction in which an igloo-like dome is constructed with a stone interior, and a ceiling that is higher than the entrance doorway”.



Fig. 10 - Shionjiyama Kofun in Yao, Osaka, seen in Google Earth Pro. Many thanks to Google.

Due to South, facing North

Figure 11 shows Ojin-tenno-ryo Kofun (information and an image of a laser survey map in www.city.habikino.lg.jp). This kofun has its symmetry axis in the south- southeast direction. It is facing the north-northwest direction.

Ojin-tenno-ryo Kofun was built in the early 5th century. It is the largest in Furuichi Kofun Group. It is the second-largest Kofun after Nintoku-tenno-ryo Kofun at Mozu Kofun Group in Sakai City, which is the largest mounded tomb in Japan. The mound of Ojin-tenno-ryo Kofun has a round rear section with a diameter of 250 m. The square front is 300 wide. “The height of its mound is 36m, which corresponds to a building of 12-storey”. “They say that the sat amount of Ojin-tenno-ryo Kofun is mostly the same as that of Nintoku-tenno-ryo Kofun. ... it is estimated that Nintoku-tenno-ryo Kofun was built to mobilize more than a total of 6.8 million people, and it takes approximately 16years to build this huge mound”.

The kofun are surrounded by moat and banks. Around, satellite tombs, such as square and round-shaped mounds, are located. “The east side of the moat and bank are distorted, [being] not in line symmetry with those of the west the west side. The cause of this distortion is due to the fact that though Futatsuzuka Kofun to see in front was built earlier than Ojin-tenno-ryo Kofun, then Ojin-tenno-ryo Kofun was built later on the residual

space of the plateau”.

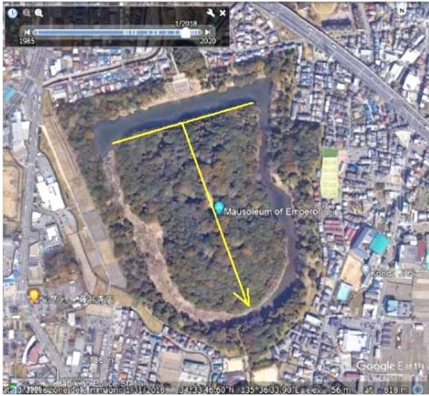


Fig.11 a - Ojin-tenno-ryo Kofun in Google Earth Pro. Many thanks to Google.

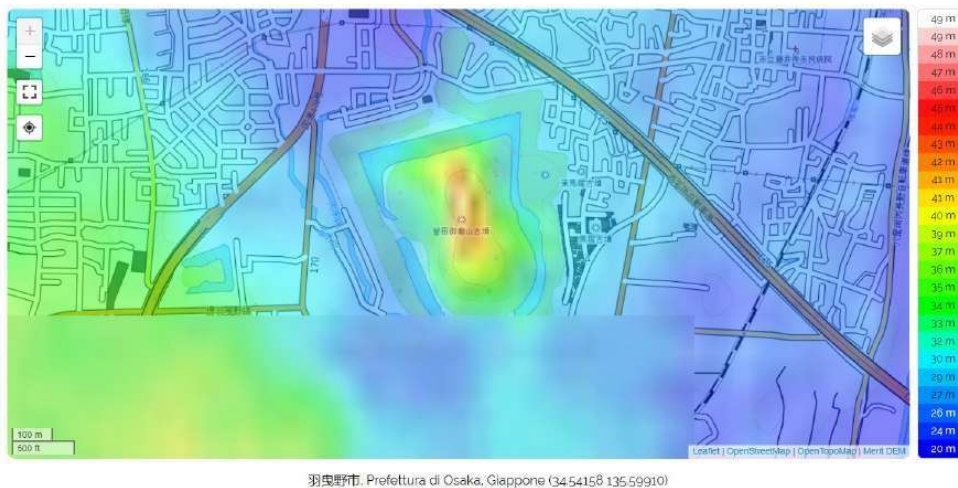


Fig. 11 b – The site of Ojin-tenno-ryo Kofun in a map provided by the web site <https://it-ch.topographic-map.com>. Many thanks to Yamazaki D., D. Ikeshima, R. Tawatari, T. Yamaguchi, F. O'Loughlin, J.C. Neal, C.C. Sampson, S. Kanae & P.D. Bates, 2017, for their fundamental work on digital elevation data and models, and many thanks to the excellent web site, which is fundamental for the maps.

From [Wikipedia](#). Emperor Ōjin (応神天皇, Ōjin-tennō), also known as Hondawake no Mikoto (誉田別尊) or Homuta no Sumeramikoto (譽田天皇), was the 15th legendary Emperor of Japan, according to the traditional order of succession. No firm dates can be assigned to this Emperor's life or reign, but he is conventionally considered to have reigned from 270 to 310. According to the Shinto religion and Buddhism in Japan, Emperor Ōjin is the divine spirit of the deity Hachiman (八幡神).

Why two parts?

We could ask ourselves why the keyhole-shaped kofun is composed of two parts. In fact, it

is a tumulus made by two mounds.

In “Ancient Japan and religion”, in the “Nanzan Guide to Japanese Religions”, 2006, we can find an answer given by the author, Matsumura Kazuo. “Kofun were the graves of the powerful, and the rituals of succession were held at the same time of the burial. Moats created a sacred space that separated kofun from the outside world. Three levels of upper, middle, and lower steps were carved into the burial mound, and clay figurines, shaped vessels, and jar pots were placed at each level. It appears that there were installed in order to prevent the entry of evil forces from the outer world. The slope of the upper level was covered by slate tiles, so that when the sun shines it is conspicuous, indicating that it was meant to be seen as a man-made monument. There was a stone burial chamber placed at the back part of the top of the mound. Shield and quiver figurines were placed at the corners of the chamber expressing authority and force, and a mansion-shaped figurine was placed in the center.”

“In some cases chair-and-serving-table figurines were placed in front of the mansion figurine and these are thought to have been used for ritual feasts for the dead. Also there are many cases where a platform was built at the top of the front part of the mound and clay figurines were placed there. *When we consider this, it seems that the back part of the mounds were the domain of the dead and the front part the domain of the living*, the back part being the place of succession and the front part being that of ascension (Mizuno 1986, pp.74-83; Kokugakuin Daigaku Nihon Bunka Kenkyūjo 1999, pp. 67- 130).”

The observation that the front part is the domain of the living and the back part of the dead is very interesting, and it seems in good agreement with a geomantic view of two separate directions, one of the life, the other of the death.

Pits and corridors

As we have shown, the orientation of kofun had been studied by Saito Tadashi. And we have seen that the orientation is considered as the direction facing the square end of the keyhole tomb, where there is the Torii gate.



The Daisenryo kofun is oriented south-southwest.

In 2022, MDPI published an article <https://www.mdpi.com/2072-4292/14/2/377> that **does not mention the Saito Tadashi's research**. In the abstract, the MDPI article tells: “Our results strongly point to a connection of all Kofun entrance corridors with the arc of the sky where the Sun and the Moon are visible every day of the year; additionally, these show an orientation of the keyhole Kofun to the arc of the rising/shining Sun, the goddess that the Japanese emperors put at the mythical origin of their dynasty.” **Let us stress that in kofun we have burial chambers connected by pits to the top of the burial mounds, and that we have burial chambers connected by corridors to the side of the burial mounds. Of course, if we do not know if the kofun has a pit or a corridor, we cannot assume that a corridor exists.**

In the case of Daisenryo Kofun (Mozu Group), in books by Agency for Cultural Affairs https://www.bunka.go.jp/seisaku/bunkazai/shokai/sekai_isan/ichiran/pdf/r1419077_06.pdf it is told that, for the Mozu Group, “the burial facility consists of a pit that was dug from the top of the mound when it was largely completed, and a coffin and a compartment (kaku) that were installed within it”.

The article in MDPI assumes all the kofun have a corridor parallel to the square side of the kofun, but this is not true (we can have a pit and not a corridor, and, if the corridor exists, it is not necessarily parallel to the base of the kofun, and if it is parallel, we must consider the orientation, that is, to the left side or the right side of the kofun).



WHY direction B INSTEAD OF direction A? WHY?

In the Daisenryo kofun, and the other kofun of the Mozu Group, is there a pit or a corridor? There are PITS, NO corridors. Consequently, it is impossible to say that ALL KOFUN HAD A CORRIDOR FACING SUN or MOON. But this is what we find in MDPI.

<https://phys.org/news/2022-01-secrets-ancient-japanese-tombs-revealed.html>

“The secrets of ancient Japanese tombs revealed thanks to satellite images”, January 2022.
“The team measured the orientation of more than 100 Kofuns and came to interesting conclusions. The results—just published in the scientific journal “Remote Sensing” — indicate a **strong connection of the Kofun entrance corridors with the arc in the sky where the Sun and the Moon are visible every day of the year, and show the orientation of the hugest keyhole-shaped Kofuns to the arc of the Sun rising/shining. In particular, the **Daisen****

Kofun is oriented towards the Sun rising at the winter solstice”.

Daisenryo Kofun has a pit chamber, not a corridor! Where is the entrance of the corridor? Daisenryo Kofun is oriented south-southwest.

Phys.org is also writing: “For these reasons, it is impossible to obtain accurate measurements of size, height and orientation. Furthermore, their number discourages any on field investigation. It is therefore natural to study them using high-resolution satellite images, which furnish simple but very powerful tools for remote sensing investigations.”

“their number discourages any on field investigation”?

WHAT? Saito Tadashi was not discouraged by the number! AND Saito Tadashi investigated kofun in a number LARGER than that investigated in MDPI, without satellites.

UNESCO World Heritage nomination documents

A fact regarding the link I proposed before is necessary to stress.

https://www.bunka.go.jp/seisaku/bunkazai/shokai/sekai_isan/ichiran/pdf/r1419077_06.pdf

Reference to "Bunka.go.jp" means reference to "UNESCO World Heritage nomination documents". Actually bunka.go.jp is the website for Japan's Agency for Cultural Affairs, which is responsible for submitting documents like the World Heritage nominations to UNESCO. The document at the link given above is part of the official nomination file for the Mozu-Furuichi Kofun Group (which includes Daisen Kofun) for UNESCO World Heritage status. Therefore, citing this document as saying that for the Mozu Group, 'the burial facility consists of a pit that was dug from the top of the mound when it was largely completed, and a coffin and a compartment (kaku) that were installed within it' is indeed directly referencing a UNESCO-related official document that provides authoritative archaeological information about the Daisen Kofun's internal structure. **When I am quoting from bunka.go.jp link regarding the pit burial chamber, I am leveraging a highly authoritative and internationally recognized source.**

<https://stroly.com/maps/1646128420/>

<https://web.archive.org/web/20250428223407/https://stroly.com/maps/1646128420/>

Burial mound of Emperor Nintoku (Daisen burial mound, or Daisen-ryo burial mound)

“Built around the middle of the 5th century, with a length of about 486 meters, this is Japan's largest keyhole-shaped kofun burial mound. ... It is one of the three "Mozu-no-mimihara" tombs. Its grave mound was built in three layers, it is surrounded by three moats, and it contains more than 10 subsidiary burial mounds. ... From above it looks like a circle combined with a square to form a burial mound in the uniquely Japanese keyhole shape. It is estimated to have been constructed around the middle of the 5th century and to have taken about 20 years to build. It is Japan's largest keyhole-shaped burial mound. Together with the burial mound of Emperor Hanzei (Tadeiyama burial mound) to the north, and the burial mound of Emperor Richu (Misanzai burial mound) to the south, it is known as one of the

three "Mozu-no-mimihara" imperial tombs. It is currently managed by the Imperial Household Agency as the middle of those three, and as the tomb of Emperor Nintoku. **The front section of the grave mound faces south.** The tumulus's entire length is about 486 meters. The diameter of the rear, rounded section is about 249 meters and its height is about 35.8 meters. The width of the front section is about 307 meters, its height is about 33.9 meters and it is formed by three layers. There are protruding sections on both sides of the "neck" area. It is surrounded by three moats, the outer of which was re-dug in the Meiji period (1868–1912). It has fukiishi stones that cover the mound like shingles and haniwa clay figures that were buried with the dead. Figures in the shape of people (with female heads), water birds, horses, deer, and houses have been excavated. During investigations from around 1955 and more recently, Sue ware pots were excavated from the protruding sections, providing further evidence of when the burial mound was created. **In 1872, a long, stone coffin placed in a pit-type stone burial chamber in the front section was opened, and a sword, armor, and glass pots and plates were excavated. These artifacts were reburied,** but detailed illustrations of them were recorded and the armor was a beautiful gilt bronze. As befitting of Japan's largest keyhole-shaped burial mound, there are more than 10 subsidiary burial mounds around it. It is referred to as the burial mound of Emperor Nintoku, but it was built after the burial mound of Emperor Richu was, which is opposite to the order of their reigns mentioned in the Nihon Shoki record of history and other ancient documents, which give the order as Emperor Nintoku, then Emperor Richu. Address Daisencho, Sakai Ward, Sakai, Osaka 590-0035 Official Guide SAKAI tourism & convention Guide Website Google Maps Route Search

Let us continue with pits and corridors. From <https://jref.com/articles/kofun-period.208/>

“The appearance of tomb mound buildings at the end of the third century in Japan is so sudden that early archaeologists thought the tombs reflected either conquest or influence from outside the archipelago. The identity of the contributing society was sought among the tomb-building cultures of China and northern Korea”. However, in 1952, the Japanese archaeologist Kobayashi Yukio demonstrated that “there were no similarities in mound shape of burial chamber between Japan and the continent. ... The earliest tomb mounds of the Kofun period were built in the Kinai Region (畿内, Kyōto-Nara- Ōsaka). From there, tomb building spread to northern Kyushu ... *Early tombs had either round or keyhole-shaped mounds.* Keyhole tombs may have either front-square and rear-round mounds (前方後円墳 zempō-kōen-fun) or front-square and rear-square mounds (前方後方墳 zempō-kōhō-fun). *The front mounds may have originally served as a place for funerary rites; the main burial is usually in the rear mound.* ... Burial facilities consisted of a wooden coffin buried directly in the summit of the mound or placed in a stone chamber of the tateana sekishitsu (竪穴式石堂, lit. vertical hole, stone chamber”) style. **To construct a stone chamber, a pit was sunk into the top of the mound and lined with brick-sized stones.** A floor of smooth clay was prepared for the wooden coffin. **Then ceiling rocks were laid to seal the chamber; finally, the earth was mounded over the top.** Clay cylinders and funeral sculptures (埴輪 haniwa) were often placed on the tomb summit over the grave. Usually, the surface of the tomb was paved with rocks. ... In the late fourth century, tomb building spread further into eastern and northern Japan and to the western coastal areas. The tombs assumed a greater variety of shapes, square or gourd-shaped, formed by two round mounds joined together. Alternate burial facilities were also developed: large stone coffins were

placed in the **pit-style chambers** or directly into the ground, and wooden coffins were embedded in prepared clay enclosures rather than stone chambers. ... In the fifth century, the character of the tombs underwent drastic changes. ... Wide moats became a common feature, dramatically increasing the area of the tombs (e.g. the Daisen-Kofun, the tomb of Emperor Nintoku in Ōsaka, or the Ōjin Mausoleum). ... [During the Middle Kofun- Period] **a new type** of tomb chamber called yokoana-shiki-sekishitsu (横穴式石堂, lit. “horizontal hole, stone chamber”) was also transmitted from the Korean peninsula in the fifth century. **Equipped with a corridor entrance**, this kind of chamber was oriented so that one could walk into it, rather than only being accessible through the ceiling like the pit-style chamber. To construct a corridor-style chamber, a level surface was provided on the mound, and the stone chamber was then built upon the flat surface. The entrance to the corridor was positioned so that it opened onto the slope of the mound. Finally, the earth was piled over the chamber, embedding it in the centre of the mound, e.g. the Ishibutai Kofun (石舞台古墳) in Asuka, Nara Prefecture. The corridor allowed the tomb to be used not just once but several times, and in the late Kofun period, family tombs became quite popular.”

From

https://www.miyazaki-archive.jp/d-museum/mk-heritage/en/specialmention/urial_thought.html

“Tombs in East Asia underwent a major transformation, from pit- type burial facilities such as pit-style stone chambers to tunnel-type burial facilities. These tunnel-type burial facilities spread throughout East Asia under the influence of the Chinese mainland (brick-chambered tombs), passing south on the Korean Peninsula from Koguryo to Paekche and Kaya, and then on to the Japanese archipelago. Stone chambers appeared from the second half of the 4th century to the beginning of the 5th century. In northern Kyushu, stone chambers with a side entrance appeared, which then developed into corridor-style stone chambers. While these stone chambers were only found in a limited number of areas during the 5th century, including Kinai, by the 6th century they were being built throughout the Japanese archipelago.”

Kofun (tumulus) (古墳) from

[www.japanese-wiki-corpus.org/history/Kofun%20\(tumulus\).html](http://www.japanese-wiki-corpus.org/history/Kofun%20(tumulus).html)

[https://web.archive.org/web/20220708071054/www.japanese-wiki-corpus.org/history/Kofun%20\(tumulus\).html](https://web.archive.org/web/20220708071054/www.japanese-wiki-corpus.org/history/Kofun%20(tumulus).html)

“Shapes: Beginning with the round barrow shape and square tumulus which are the basic shapes, there are many kinds of kofun such as hakkaku-fun (octagonal tumulus) (Noguchino Ono-haka) and candy-wrap (keyhole shape with one more handle) shape mound (Kushiyama Kofun and Tatetsuki Kofun). In addition, there are the zenpo-koen (keyhole-shaped tomb) mound, zenpo-koho (square front, square back) mound, soen (double round) shape mound and soho (double square) shape mound, which all have two tumuli. Major kofun usually have two tumuli. There are many different shapes of mortuary spaces where the dead are entombed. A representative of a zenpo-koen (keyhole-shaped tomb) mound is Daisen (大山 also written as 大仙) Kofun in Sakai City, Osaka Prefecture. Because such a long time has passed since their construction, most kofun have trees growing on them, but the true state

of a kofun at the time of completion was without trees. Such examples are Goshiki-zuka Kofun and Mori Shogun-zuka Kofun, which have both been restored to their original states.”

“Mortuary Spaces: **There are two types of mortuary spaces of kofun - pit type and horizontal tunnel type. The pit type consisted of a hole which was made from the surface of a tumulus called a Boko (a tunnel to put a coffin in), where a coffin was placed at the bottom, and filled with sand again.** Because of the structure, an added burial was impossible, and there was no space where people were able to move around. There are pit-type sekkaku (stone surrounding wooden coffins), nendokaku (clay surrounding wood coffins), and hakoshiki-sekkan stone coffins and wood coffins. Regarding the pit-type sekkaku, after placing a wooden coffin at the bottom, stones (building stone) are built up as walls and then ceiling stone is placed as a cover. The style was popular from the beginning to the middle of the Kofun period (tumulus period). For nendokaku, a wooden coffin placed at the bottom was wrapped in layers of clay which is considered a brief version of a pit-type sekkaku. This was popular from the middle of the beginning/middle of the Kofun period. Hakoshiki-sekkan consisted of making an enclosure with stones around the dead body like a box, and is the burial method from the Jomon period. The wooden coffin method was to simply place a wooden coffin and make no space in the tunnel; this is a burial method from the Yayoi period.”

“**As for the types which have horizontal tunnels, mortuary spaces are built on the ground or on a surface during construction of a tumulus and the tumulus is then built on it.** Other types include Yokoana-shiki sekishitsu (horizontal stone chamber) and Yokoguchi-shiki sekkaku (stone sarcophagus with side entrance). Yokoana-shiki sekishitsu consists of a tunnel part as a passage (called sendo) and a room part for entombment (called genshitsu). **When looking at the rock chamber from above, if the passage is located at the center of the burial chamber, it is called Ryosode-shiki and if the passage is located toward right side or left side, it is called Katasode-shiki.** There are a variety of coffin types, such as stone coffins, wooden coffins and kanshitsu (dry lacquered) coffins. After an entombment, the passage is blocked by Heisokuishi (piled stones) or Tobiraishi (door stone), but added burial is possible when the block is removed. This method became popular from the late Kofun period. Yokoguchi-shiki sekkaku was originally a stone coffin which was placed in a rock chamber and the stone coffin itself became a mortuary space; many of this type can be seen at the end of the Kofun period.”

“Coffins: In the Kofun period, a dead body was placed in a coffin and then buried. There were wooden, stone and ceramic coffins and so on depending on the materials used. A hollowed out wooden coffin is called a "Sakitake-shiki mokkan" (split bamboo type wooden coffin) and made of a big tree which is divided into two pieces; the inside of both pieces is then hollowed out and became a cover and body of the coffin. However, the term "Sakitake-shiki" might be inappropriate because a big tree cannot be easily split like bamboo. A wooden coffin type called "combinational type" consists of four rectangle-shaped panels, a cover, bottom part, side plates for the right and left sides, and two small square-shaped panels, which are sometimes used as partitions.”

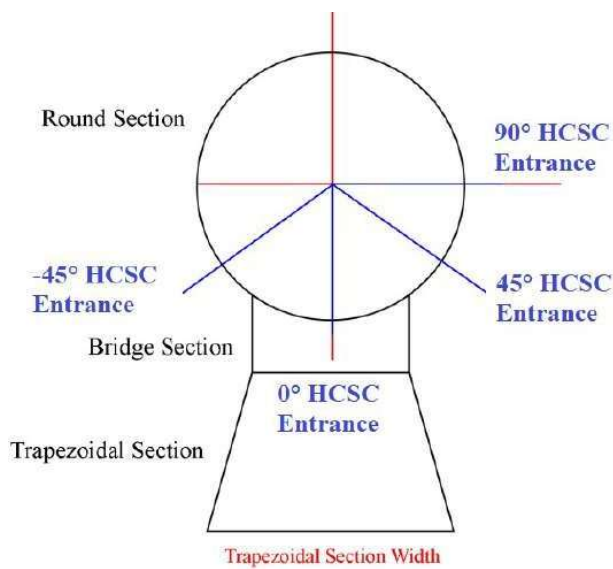


Fig. 12 – In (Lee, D., 2014), it is told that the corridor (in Korean kofun) has a theoretical entrance orthogonal to the symmetry axis. However, offset is present in seven known cases.

The entrance

From Lee, D., 2014, it seems that a sort of rule exists regarding the direction of the corridor in Korean Kofun. Let us try to find an example of Japanese keyhole Kofun with a corridor passage and an evident entrance from satellite images. It is the Watanuke Kannonyama Kofun (綿貫観音山古墳), a Kofun located in the Watanuki neighborhood of the city of Takasaki, Gunma Prefecture in the northern Kantō region of Japan. The site dates from the late 6th Century. en.wikipedia.org.

The Watanuki Kannonyama Kofun is located on a plain on the west bank of the Ino River, six kilometers east of the city of Takasaki, and is constructed facing north, according to Wikipedia. That is, the side of the square part is facing North (actually north-northwest).



Fig. 13 - Watanuke Kannonyama Kofun.

“An archaeological excavation was conducted by the Gunma Prefectural Board of Education from 1967 to 1968. The tumulus has a two-tiered construction and a double horseshoe-shaped moat. From the excavated Sue ware pottery, the date of construction is estimated to be the latter half of the 6th century AD. Haniwa were found in various locations around the tumulus, but no trace of fukiishi were discovered. The haniwa were of especial interest, as they depict men, women, boys and girls, in various costume, including what appear to be warriors in armor and with shields, farmers and aristocrats. ... **The burial chamber is a horizontal trapezoidal stone-lined room in the middle of the posterior circular portion, opening towards the southwest.** It was found to be intact. The dimensions were the largest found in Gunma Prefecture, with a total length of 12.65 meters. The wall stones are andesite blocks, and the ceiling stones are sandstone. The blocks weigh up to 22 tons, but as there is no source for these materials from the neighborhood of the burial mound, it was necessary for these stones to be transported from a considerable distance to construct this tomb. The grave goods included two bronze mirrors, gold, silver and glass jewelry, iron swords, iron spearheads, fragments of armor, horse harnesses, saddles, stirrups and Sue ware, Haji ware, copper water bottles and other containers, many of which were found to be in excellent preservation. These included copper water jars and iron helmets thought have been made in Northern Qi, and a copper water bottle and a mirror that were identical to objects excavated from the burial chamber of the Tomb of King Muryeong of Baekje in Gongju, South Korea. As these objects must have been cast from the same mould, it indicates a strong connection between the rulers of the Keno region of ancient Japan and the ancient Korean Peninsula”.

In this kofun, we can see that the corridor is, more or less, perpendicular to the long axis of the structure. But this corridor is pointing toward the sunset.

Gunshufun Tumuli and Kinship in Late kofun era

In the “Routledge Handbook of Premodern Japanese History”, 2017, Friday K. F. Editor, we can find more details about the evolution from pits to corridor-style chambers.

“In the sixth century – the Late Kofun era – society transformed drastically, as is clearly reflected in several major changes in mortuary practices. These changes include a decline in the construction of large keyhole-shaped tumuli, a drastic increase in the construction of minor circular burial mounds in clusters (referred to as gunshufun), and the adoption of corridor-style horizontal burial chambers (referred as yokoana-shiki sekishitu) that could be opened for additional interments after the initial burial”.

“While the decline in the construction of keyhole-shape tumuli indicates that such tombs came to be restricted to fewer, and even higher-ranking elites, the appearance of gunshufun indicates that far more people came to be buried in mounded tombs in the Late Kofun era than before. Scholars interpret gunshufun as a reflection of the central policy incorporating more people into its own social system, and of more people rising to the social class that allowed them to be buried in mounded tombs. It may also be that ideology of the central polity changed, and keyhole-shaped tumuli were no longer as important as symbols of power as they had been in the Early and Middle Kofun eras.”

*“The adoption of the corridor-style horizontal burial chambers was important because the size of the chamber would become a status symbol, regardless of the form and size of the tomb itself. **This drastic change may have been initiated by King Keitai** (r. 507-531 or 534). For the first time in the Kofun era, burial chambers of the same structure and style were constructed in all mounded tombs, from the largest keyhole-shaped tumuli - such as Keitai’s own – to small circular tombs less than 20 meters in diameter.”*

“The adoption of the corridor-style horizontal burial chambers was in a sense inevitable, because kinship structure changed in the sixth century. According to a very innovative study by Tanaka Yoshiyuki (1953-2014), while brothers and sisters had been buried together until the beginning of the sixth century, fathers and children who were not selected to be the heir came to be buried together from the early sixth century on. From the middle sixth century, mothers were also buried with their husband. In other words, burial chambers had to have a structure that would allow additional interments, resulting in a corridor-style burial chamber that could be reopened later.”

Then, the adoption of the corridor-style chamber, instead of a pit, was due to an evolution in society.

Imashirozuka kofun is, possibly, the mausoleum of Emperor Keitai, yielding large quantities of huge haniwa.

Pit-dwelling-style stone lined chamber at the square end

<https://web-japan.org/atlas/historical/his15.html>

This web page is discussing the Daisen Kofun, “One of the Largest Mausoleums in the World Believed to Be the Tomb of a Fifth-Century Emperor”.

“In the Japan of the late third to late seventh centuries, the custom was to bury people of high social status in tombs that were covered with large mounds of earth. Such constructions are called kofun in Japanese archaeology, and the period is known as the Kofun Period (ca 300-710). These burial mounds come in various shapes and sizes and the characteristic form in Japan is the keyhole-shaped tumulus. The Daisen Kofun, with an overall mound length that exceeds about 500 meters (1,640 feet), ranks in scale alongside the Mausoleum of the First Emperor of the Ch'in dynasty in China and the Great Pyramid of Khufu in Egypt”.

“This huge tomb is located in the middle of a cluster known as the Mozu Tumuli, which consists of 92 large and small kofun lying within an area of roughly 16 square kilometers (6.2 square miles) in the city of Sakai in Osaka Prefecture. In the Kinki region (located in west central of Japan) during the Kofun Period, the leaders during the flourishing days of Yamato hegemony favored the use of key-hole-shaped burial mound, and nearly all of the historical tombs of emperors and empresses that are currently administered by the Imperial Household Agency are of this form”.

“It is said that the Daisen Burial Mound was built in the 5th century as the tomb of Nintoku, the 16th Emperor. It appears that the slopes of the mound and the moat around it were used for some kind of religious rites, since unglazed pots and hollow circular clay figures

modeled on people and animal forms, known as haniwa, have been unearthed. Excavations in 1872 discovered a stone sarcophagus in a **pit-dwelling-style stone lined chamber** that was buried **beneath the mound at the square end**. Gold-plated armor, a helmet, and an iron sword were also found.” There is also the Kurohimeyama tomb, which has a burial pit in the square part, as told in (Fukunaga et al., 2018).

“One such example of a medium-sized keyhole-shaped mounded tomb is Kurohimeyama. Measuring 144m long, this mounded tomb was built in the second quarter of the 5th century, slightly after Kondagobyoyama, just outside the Furuichi group. The excavation of the pit-style burial chamber in the frontal mound resulted in the discovery of 24 sets of iron armor, the greatest amount of armor found from a single tomb to date. All 24 sets consisted of iron helmets and iron cuirasses, and twelve of them were accompanied by neck and shoulder guards. It is important to note that these suits of armor were discovered in the front part of the mounds; as mounded tombs were built for the individual interred in the rear mound, the iron armor can be said to have thus been deposited in a subordinate burial chamber. An even larger quantity of iron may thus have been deposited in the main burial chamber of the round rear mound; unfortunately the main burial chamber had been destroyed before the archaeological excavation conducted in 1946.” (Fukunaga et al., 2018).

In Fukunaga et al., 2018, it is also stressed the appearance of the ‘satellite tombs’, accompanying a giant keyhole-shaped tumulus. “The practice of building such satellite tombs is witnessed only in the 5th century”. The authors link these tombs to the fact that “the system of social ranking or stratification” in polity of the 5th century grew more complex.

From https://en.wikipedia.org/wiki/Kurohimeyama_Kofun. “The Kurohimeyama Kofun (黒姫山古墳) is a Kofun period keyhole-shaped burial mound, located in Mihara ward of the city of Sakai, Osaka in the Kansai region of Japan. The tumulus was designated a National Historic Site of Japan in 1957 with the area under protection expanded in 1978. The Kurohimeyama Kofun is a zenpō-kōen-fun (前方後円墳), which is shaped like a keyhole, having one square end and one circular end, when viewed from above. It is located in the wide flat land of the Minamikawachi region between the Furuichi Kofun Cluster and the Furuichi Kofun Cluster. The tumulus has a total length of 73 meters, with a 43-meter diameter posterior circular portion, and is orientated to the west. It was once covered in fukiishi and had rows of cylindrical haniwa. There was a ceremonial platform extending off of the northern edge of the central constriction and the tumulus was surrounded by a moat with a width of 15 meters and depth of two meters. The tumulus is believed to have been associated with the Tajihī clan, a powerful tribe which controlled this area around the mid-fifth century”.

“In 1946, a **pit-type stone burial chamber was detected in the anterior rectangular portion**, and this was first excavated in 1947, with five more excavations occurring between 1948 and 2000. Finds included 359 cylindrical haniwa, each measuring 80 centimeters in height by 40 centimeters in diameter, with a slightly recessed bottom. In addition, 25 or more lid-shaped haniwa at intervals between the cylindrical haniwa. From within the burial chamber, 24 sets of armor were found, mounted in an upright position in two rows. This is the largest number of armor which has been found at any site in Japan. In addition, there were 24 iron swords, 9 iron spearheads, 6 iron stakes, 56 iron arrowheads, and 5 knives, along with other items. The burial chamber itself was for meters long and was covered by

eight sandstone blocks forming the ceiling, and river stones to provide drainage on the floor. **The burial chamber which was presumed to have existed in the posterior circular mound was apparently robbed in antiquity, and there is no trace remaining**".



Fig. 14– The Kurohimeyama kofun.

From the web site:

<https://www.city.sakai.lg.jp/foreign-language/english/visitors/enjoying/sightseeing/kofunkombs.html> some further information.

“Kurohime-yama Kofun is a keyhole-shaped tomb situated facing west and located between Sakai's Mozu and Furuichi Kofungun in the cities of Habikino and Fujiidera. The round rear part has a diameter of 67 meters, while the front part has a width of 64 meters. With a total length of 114 meters and a height of 11 meters, the tomb has a two-tier structure. Archeological surveys have revealed an area around the outer moat that was used for rituals and other functions. **Kurohime-yama Kofun was discovered and surveyed by Suenaga Masao in 1947** soon after the end of World War II. Although Suenaga found that the burial chamber in the round rear part of the tomb had been destroyed by grave robbers, a stone chamber was discovered in the middle of the square front part of the tomb. Inside the chamber were found 24 suits of armor and a large number of iron weapons and arms, creating a stir at the time. The Tomb was designated a national Historic Site in 1957 (with surrounding areas added in 1978), and environmental work was performed on the site from 1989 to 1992. The iron armor underwent conservation treatment and is currently on display at the Mihara History Museum”.

Nintoku-tenno-ryo Kofun, once more

From “Monuments and Sites Division, Agency Cultural Affairs”, Volume 6.

“Nintoku-tenno-ryo Kofun, a keyhole-shaped mounded tomb located in the central part of the Mozu area, is the largest kofun in Japan. It was constructed on the western edge of the plateau, with its square front part facing toward the south so that the contours and the

principal axis of the mound would run parallel to each other. The location and mound direction were apparently selected with clear consideration of how it would be viewed from Osaka Bay. On the bank of Nintoku-tenno-ryo Kofun, Chayama Kofun and Daianjiyama Kofun are situated. As they are located on the bank of Nintoku-tenno-ryo Kofun, these three are treated as one component part.”

“In the close vicinity around the moat of the Nintoku-tenno-ryo Kofun, there also exist many tombs such as Nagayama Kofun, Genemonyama Kofun, Tsukamawari Kofun, Osamezuka Kofun, Magodayuyama Kofun, Tatsusayama Kofun, Dogameyama Kofun, Komoyamazuka Kofun and Maruhoyama Kofun. Nintoku-tenno-ryo Kofun’s mound length is 486 m, and its total length, including the moat, is 840 m. The height of the round rear part is 34.8 m. The mound has three tiers, and projections are attached to both sides of the constricted part”.

And then we can find an important description of what we could guess being inside the tumulus. “**According to the Edo-period geographical booklet of Sakai “Zen-kai sho shi” (1757), a stone coffin was used in the burial facility in the round rear part; with a length of around 318 cm and a width of approximately 167 cm, making it the largest stone coffin in Japan. In 1872, on the south slope of the square part, a pit-style stone compartment and a chest-shaped stone coffin were uncovered,** from which grave goods were unearthed. Sketches made at the time revealed that the burial goods included armor made of gold-plated bronze plates, the only example of its kind, as well as glass containers assessed as having been brought from West Asia. On the sketches, it is written that the stone compartment was constructed by piling up river rocks and that its internal measurements were as large as 3.9 m by 2.4 m. For the coffin, an oblong chest-shaped stone coffin with projections for securing ropes (nawakake tokki) was used; it is recorded that its length was between 2.4m and 2.7m and its width was 1.45m. The grave goods were returned to the chamber, and the chamber and the coffin were both reburied and preserved in this condition” [from Volume 6].

“The mound is surrounded by a triple moat and Nintoku-tenno-ryo Kofun is the only giant keyhole-shaped kofun with this characteristic. The total area, including the triple moat, is a sprawling 480,000 m². One trial calculation, indicates that the construction of the gigantic mound and the extensive moat would have required 15 years and eight months and, assuming a maximum of 2,000 laborers per day, a total of 6.8 million people. Both cylindrical and representational haniwa were found from the mound and moat, and Sue ware jars were unearthed from the projections. It is estimated that 29,000 cylindrical haniwa were arranged at this site. The human-shaped haniwa unearthed from the outer moat are early examples of their kind, while the horse-shaped haniwa are examples of particularly large-sized items. **The construction period is dated to the mid-Middle Kofun period**”[from Volume 6]. The period is therefore from the middle to end of the fourth century. The Emperor (Nintoku-tennō), the 16th Emperor of Japan, according to the traditional order of succession, had conventionally reigned from 313 to 399 (Ponsonby-Fane, 1959).

In the Daisen Kofun, we have two burial chambers, one in the front square part, the other in the rear round part. Who could have been buried there, Emperor and Empress? May be, could it be better the Emperor and his Bodyguard? No, we have seen that the keyhole kofun were made for a single person. The chamber in the square part was a subsidiary place for precious objects. In any case, we have an axis, and evident axis, which is linking the two parts of the mounds, with two burial chambers inside. And this is the axis of the “bridge”

between the two parts of the mounds. It is the axis of the kofun. This is the axis that we must consider for the orientation of kofun, not the perpendicular one.

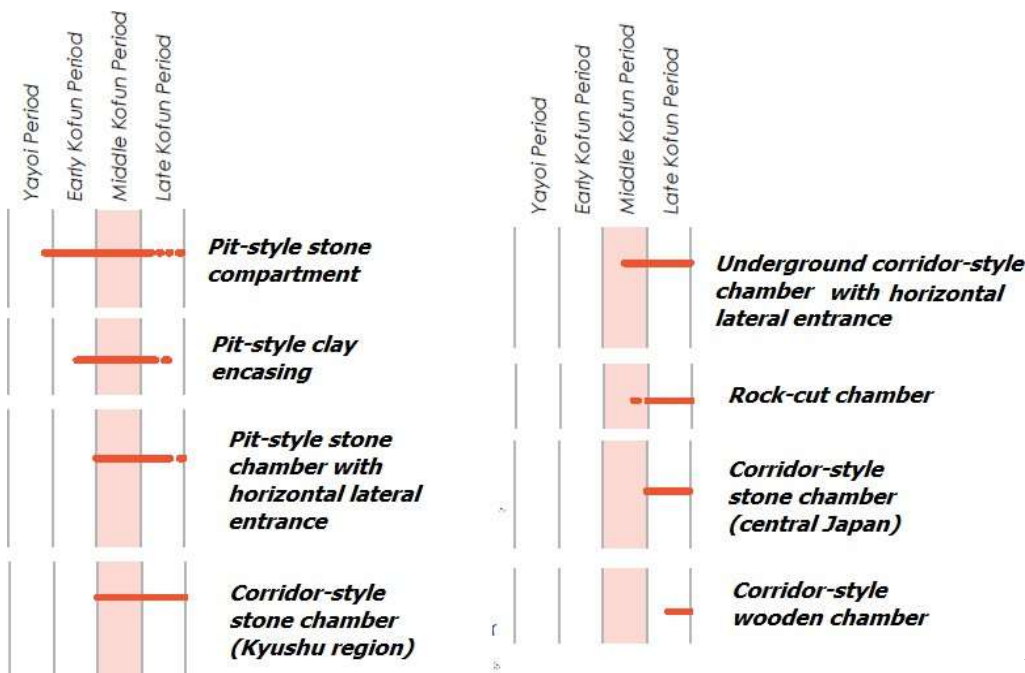
Let us report other observations from “Monuments and Sites Division, Agency Cultural Affairs”, Volume 6. Each of the kofun is comprising a burial facility, directly related to the burial of a body, “and it is thought that apart from a few exceptions, many of them are still in their original positions. While burial facilities of kofun and grave goods vary widely, depending on the period [see the Figure 2-12 in the given reference], the type of the former and the quality and quantity of the latter are always relative to the size of the mound throughout the whole Kofun period: the larger the kofun, the higher the rank of its burial facility is. ... the Middle Kofun period, which was the peak of the Kofun period. ... **The burial facility consists of a pit that was dug from the top of the mound when it was largely completed,** and a coffin and a compartment (kaku) that were installed within it [see Photo 2-3 of the given reference]. **While mounded tombs in other parts of the world usually involved a construction process in which burial facilities were first built and then covered with piles of earth,** kofun on the Japanese archipelago, where burial facilities were dug into the mound top during the final stage of construction or after construction had completed, are very distinctive in the way burials were conducted and how the mounds were used ... The body of the deceased was interred in a stone or wood coffin, which was then often placed in an outer compartment. Coffins include oblong chest-shaped, boat-shaped and box-shaped examples. The burial compartments are of two types: a stone compartment with stones piled up around the coffin, and a clay encasing around the coffin. Compartments were mainly used as the burial facilities of large-scale tombs, while in many of the small- scale tombs, a wooden coffin was placed directly into the grave pit” [from Volume 6].

From “Monuments and Sites Division, Agency Cultural Affairs”, Volume 8, other observations can be extracted. The Reference is stressing that “tombs come in certain standardized shapes and share a common structure. Although the mounds today look like hilly forests, underneath the current land surface there are complex and elaborate earthen architectural constructions. They have symmetrical, geometrical structures, composed of circles, triangles and squares, as well as horizontal surfaces (terraces) and **sloping sides built at standardized angles.** The construction of each kofun was made possible by sophisticated design and construction techniques (e.g., for piling up earth for the mound). In addition to the structural beauty of the mounds themselves, decorative elements such as fukiishi (paving stones) and haniwa (clay figures) covering the surface of the mounds are another major feature of kofun. Furthermore, the burial facility, which fulfills the main function of the tomb, is located in a pit dug into the top of the mound after its construction had almost been completed. **Judging from these features, kofun mounds are believed to have been designed as stages for executing burial and other funerary rituals.** This differs significantly from the purpose of many of the burial mounds found in other parts of the world, in which the burial facilities were made first, with stones or soil piled on top as a covering. As described above, kofun are mounded tombs characterized by the following features: the external surface served as a stage for funerary rituals; they were built in several shapes and display an extremely wide range of sizes; and their structure follows standard plan-types. With a high concentration of such tombs, the Mozu-Furuichi Kofun Group is genuinely outstanding even from a global perspective” (from Volume 8).

Please see Figure 3.1 of the given Reference which shows the structure of the Tsudo-

shiroyama Kofun.

“The mound of each kofun not only housed the body of the deceased in a grave pit dug into the top of the mound, but also served as a stage for funerary rituals, ... Most burial mounds found throughout the world are piles of earth or stone covering a burial chamber. In contrast, the mounds of Japan’s kofun are considered to have functioned as a stage for conducting funerary rituals, including the burial itself. In Japan’s kofun, burial chambers were left open after the completion of mound construction or chambers were opened up by digging into the top of the mounds after completion, then the burial ceremonies were performed decorating the flat top and tiers of the mounds to serve as the stage for the ceremonies. The kofun was an important architectural facility used as the stage for funeral rituals” (from Volume 6).



This figure has been adapted from Figure 2-12 Pag. 40 of the “Monuments and Sites Division”, of “Agency Cultural Affairs”, Vol. 6. It shows the style of the burial chambers, according to the periods.

Mirrors in Kurozuka Kofun

The Kurozuka Kofun (Japanese 黒塚古墳) is a keyhole-shaped burial mound. The kofun belongs to the Yanagimoto Kofun group. The Kurozuka kofun has a total length of 132 m and a height of 11 m. It is located in Yanagimoto-chō in Tenri City (Nara Prefecture) near Yanagimoto Station. The Japanese name roughly means "Black Hill Kofun". The Kurozuka Kofun is believed to have been built in the second half of the 3rd century. During excavations in 1997/1998, many bronze mirrors depictions of gods and animal deities (sankakubuchi shinjūkyō) were found in the Kurozuka Kofun. Due to the large number, it is one of the most important mirror finds in Japan.

In (Edwards, 1999), we find detailed information. “Kurozuka is part of a cluster of six large keyhole mounds, all from the Early Kofun period, centering on Sujinryo. The easternmost of this group. Kushiyama kofun, presents an unusual shape in which rectangular platforms jut out from opposite sides of a central round portion.” The kofun is judged to be the newest in the group (late fourth century). “Sujinryo, which remains unexcavated owing to its designation as an imperial tomb, is regarded as dating from the first part of the fourth century.” Andoyama kofun and Minami Andoyama kofun, lying northwest and west of

Sujinryo, are designated as haizuke, or subsidiary tombs. They too remain unexcavated” (Edwards, 1999).

The Tenjinyama kofun, which is located just west and south of Sujinryo, was excavated in 1960. A part of the tumulus was destroyed during the construction of a roadway. The excavation exposed a stone chamber in the round portion of the keyhole. The investigators found the remains of a rectangular wooden box, containing 41 kg of cinnabar. “Twenty bronze mirrors lay neatly arranged around the perimeter of the box, and three more were placed just outside the group. No evidence was found of a human burial associated with these objects, raising the possibility that the stone chamber, and perhaps the mound itself, had been built to house a cache of precious gods. Examples are known elsewhere of subsidiary mounds that served as repositories for grave goods only” (Edwards, 1999).

The Kurozuka Kofun is a keyhole kofun, which has a pit-style burial chamber. We can see it in detail in the video “Excavating Oyamoto Kofun Group - Uncovering Early Kofun Period Mounded Tombs”. <https://www.youtube.com/watch?v=jg2J-wbfa30>



Fig. 15 – On the left, the kofun, and on the right, the burial chamber seen from above (Courtesy Google Earth)

The burial chamber is orthogonal to the symmetry axis of the kofun. This fact has been stressed by Akira Goto, that the chamber can have an orientation different from that of the kofun. In this case, we have a chamber where the body was in the position of the kitamakura.



Fig. 16 – Sakurai Chausuyama Kofun (Courtesy Google Earth)

The orientation of Sakurai Chausuyama kofun

Information about Nara kofun can be obtained from the **Archaeological Institute of Kashihara** (many thanks to this Institute for the available documents in English), at <http://www.kashikoken.jp/museum/yamatonoiseki/yamatonoiseki.html>, and http://www.kashikoken.jp/museum/yamatonoiseki/kofun/translation/english/Sakurai_Chousuyama.pdf

“In the southeast portion of the Nara basin, there are a total of six colossal keyhole tombs with mounds of 200 m or greater in length. Beginning with Hashihaka tomb, these were built one after another within the Early Kofun period. They are considered to represent the royal tombs of the initial Yamato polity. Of these colossal keyhole tombs, the two tombs Sakurai Chausuyama and Mesuriyama were built slightly apart from the rest, on the southern fringe of the urban area in the modern city of Sakurai. The Sakurai Chausuyama tomb is located in Tobi, in the city of Sakurai”. It was excavated in 1949–50, and in 2009 the round portion of the mound was reexcavated. “The mound was constructed in three tiers for the round portion and two tiers for the rectangular portion of the keyhole shape, and was entirely covered with cobbles. The long and narrow rectangular portion gives the mound a shape resembling a round handheld mirror. The mound was built by shaping the natural soil of a hilly extension, in the manner of sectioning off the end of a ridge. There is no surrounding moat, but a large-scale rectangular precinct was established around the mound”.

“At the top of the round portion is a rectangular platform 9.2 m east–west by 11.7 m north–south, on the perimeter of which an enclosure in the form of a tightly built palisade was made of logs around 30 cm in diameter. Lined up along the inside of the palisade were double-rimmed jars with holes made in their bottoms prior to firing. These are considered to be the origin of jar-shaped haniwa. **In the center of the platform, parallel to the main axis of the tomb, a large-scale vertical stone chamber was built.** The walls of the stone chamber rose up in vertical fashion, the stones were painted with **cinnabar**, giving a magnificent crimson appearance. The chamber floor, which was also the bottom of the pit dug for the chamber, was paved with flagstones that had been painted crimson. An earthen bed for the coffin was made, and on this survived the bottom portion of a wooden coffin of umbrella pine, 4.89 m long and 27 cm thick (maximum). Twelve huge ceiling stones provided a framework, upon which a covering of red clay which had been painted with red iron oxide was laid, tightly sealing the stone chamber”. The kofun was robbed, but a wide variety of goods were found inside: mirror fragments, beads, items of jasper, weaponry including iron arrowheads and swords, and various tools. From the fragments, it was estimated that no fewer than 81 mirrors were present, “including *naikō kamon* (interconnected-arc design), TLV, triangular-rimmed, and animal-motif band mirrors. It is thought that probably more than 100 mirrors were included as grave goods in the stone chamber. The tomb’s scale, its vertical stone chamber and wooden coffin, and the contents of the grave goods all bear the majestic dignity befitting a royal tomb. It is thought to have been built in the latter half of the third century, in the generation following Hashihaka, and either preceding or simultaneous with the Nishi Tonzuka tomb”.



Fig. 17 – Shimanoyama Kofun
(Courtesy Google Earth)

The three burial chambers of the Shimanoyama tomb

From the site of the **Archaeological Institute of Kashihara**, at the following link

https://web.archive.org/web/20240503005328/https://www.kashikoken.jp/museum/yamatonoiseki/kofun/translation/english/13_Shimanoyama%3Be.pdf

This is a keyhole-shaped tomb with the mound 200 m in overall length, located at Tōin, in Kawanishi-chō, in the district of Shiki, Nara prefecture. It is situated in the center of the Nara basin. “Artifacts were collected from this tomb from the Edo period until the start of the Shōwa era, and in addition to being mentioned in Unkonshi (Treatise on rocks) written by the eighteenth century collector of rare and unusual rocks Kiuchi Sekitei, specimens of bracelet-shaped stone objects and beads, etc., are in the collections of not only this museum [Museum of the Archaeological Institute of Kashiara, Nara Prefecture], but older households in the tomb’s environs, ... The **burial facility in the round part of the mound is inferred to be a vertical stone chamber**”. That is, we have a pit chamber.

Excavation was conducted in 1988 and subsequently the Archaeological Institute of Kashihara and Kawanishi-chō have conducted 13 excavations from year 1995.

“In their second excavation in 1996, **a clay compartment was found at the top of the front (rectangular) portion of the mound**. The compartment was built within a 10.5 m long by 3.4 m wide pit, situated toward its northern side. The scale of the compartment was 8.5 m in overall length, by a width of approximately 2 m. At the center was placed a 7.5-m long split-log coffin of Japanese umbrella pine, covered twice over with clay. Within the coffin, **cinnabar** had been spread over the area where the interred was placed, and near the head position were three bronze mirrors, three stone replicas of lidded containers, and ... Also, 80 wheel-shaped stone objects, ... **The possibility of the principal interred figure being female has been pointed out from the near absence of weapons among the grave goods. Further, it has become clear that another burial facility exists in between the round and front portions of the mound**. The extent of this feature has been detected only at its top ... Also, from investigations of the mound, it has become clear that the mound was built in three tiers, that the sloping side of each tier was paved with cobbles, that cylindrical haniwa were closely lined up in rows ... This tomb was built in the latter part of the fourth century, and is a representative large-scale keyhole tomb that can be placed in the transition between the Early and Middle Kofun periods, and there are opinions linking it with the chiefly lineages of the Ōyamato tomb group in the southeastern Nara basin, and those seeing it linked with the chiefly lineages of the Kazuraki region”.

Muro Miyayama tomb

<https://www.kashikoken.jp/museum/gaikokugo/en/>

https://web.archive.org/web/20240503005325/https://www.kashikoken.jp/museum/yamatonoiseki/kofun/translation/english/14_Muro_Miyayama%3Be.pdf

The kofun is in Muro, Gose, Nara prefecture. It is a keyhole-shaped mound of 238 m in overall length. This is the largest tomb in the southwestern portion of the Nara basin (the Kazuraki region).



Fig. 18 - Muro Miyayama (Muro no Ōbaka) tomb

“The tomb is located on level ground directly to the northern side of the Koseyama tomb group, which numbers more than 500 clustered tombs standing atop the Koseyama hills. The front (rectangular) portion of the keyhole mound points west, ... The traces of the moat are not distinct, but standing atop the outer rampart on the northern side is Neko-zuka, a square mound 70 m on a side, regarded as a subsidiary tomb. ... The area to the southeast of the mound is currently a pond, and it is thought that originally a shield-shaped moat encircled the tomb. The mound is constructed in three tiers, and as exterior facilities the presence of surface cobbles and haniwa rows have been confirmed. **At the top of the round portion of the mound there are two burial facilities lined up north and south.** The southern burial facility is a **vertical stone chamber** containing a chest-shaped sarcophagus of ... badly robbed ... Above the ceiling stone of the vertical chamber stood haniwa ... The northern burial facility has not been excavated, but the ceiling stones of its vertical chamber are exposed. **There are also two burial facilities in the rectangular portion of the mound,** and there are records of 11 mirrors and more than 170 beads and other items having been recovered. The current whereabouts of these materials are unknown. Additionally, material of a wooden coffin has been recovered, which is on display in this museum. Further, a burial facility consisting of a clay compartment has been detected at the top of the square projection on the rectangular portion, from which lacquered goods, iron swords, cuirass fragments, iron arrowheads, and so forth have been recovered”.

This kofun dates from the Middle Kofun period (the beginning of the fifth century).

The bridge

From <http://archaeology.jp/remains/nisanzai-kofun/> .

<https://web.archive.org/web/20240226091822/http://archaeology.jp/remains/nisanzai-kofun/>

It is said that a **huge wooden bridge for funerary rites at a king's tomb has been discovered!**

It is an article regarding Nisanzai Kofun, Sakai City, Osaka Prefecture. Middle Kofun period (mid-fifth century) - **Wooden bridge feature, in situ (near the round portion of the mound, from the southeast)** - The pictures in the article show the wooden bridge position, adapted from Hakkutsu sareta Nihon rettō 2020 [Excavations in the Japanese Archipelago, 2020] (Bunkachō [Agency for Cultural Affairs], ed., Kyodo News, 2020).

It is also known as the Richu-tenno-ryo Kofun.

“Located on a tableland overlooking Osaka Bay, the Mozu Tomb Group (Historic Site) is composed of kofun (tombs) of various sizes starting with the largest one in Japan, Nintoku Tennōryō Kofun, ... Nisanzai Kofun is a large-scale keyhole-shaped mound sitting at the southeastern edge of the Mozu Tomb Group, the third largest tomb in the group, and seventh for Japan as a whole. It ... is thought to represent the last of the kingly graves of the Mozu Tomb Group. At present, the mound is under the custody of the Imperial Household Agency as a tomb possibly connected with the imperial line, whereas the surrounding moat portion is under the management of the city of Sakai. Excavations were conducted by the city from the 2012 to 2015 fiscal years, centering on the inner moat towards the side of the mound, and during the first year an investigation was carried out simultaneously by the Imperial Household Agency as well”.

The archaeological investigations resulted in the discovery of a huge wooden bridge spanning the moat. “The following are among the facts that were clarified as a result of the investigations. (1) The overall length of the mound is 300.3 m. (2) The period of construction was the mid-fifth century. (3) The slope of the first tier of the mound was unpaved or only sparsely paved with cobbles, indicating that the trend towards sparing effort in tomb construction had begun. (4) From within the moat, in addition to ceramic haniwa many wooden implements were recovered, including fin-shaped decorations for a ceremonial sunshade, objects shaped like ceremonial fans and parasols, a wooden serving platter and a spade; thus along with haniwa, wooden sculptures had been lined up on the mound and atop the ramparts, and rituals utilizing wooden implements had been conducted”. In the inner moat, there were seven rows of post-holes, with a wooden bridge spanning the moat. “The bridge lay along the main axis of the mound, and its scale is estimated to have been approximately 12 m wide and stretching 55 m in length. Intentionally removed after but a brief period, it is thought to have been built to cross the moat in conjunction with funerary rites, and after serving a vital role as staging apparatus for those rites, it was promptly removed once they had ended”.

The article ends saying that the discovery of wooden bridge allows “a glimpse of one bit of the funerary rites conducted at a colossal mound thought to be a kingly tomb. (Uchimoto Katsuhiko)”. The following Figure shows the kofun in satellite image, and a drawing from the article, adapted to show the position and the orientation of the bridge.

Note that the BRIDGE was essential for rituals. NO corridor exists.



Fig. 19 - The Nisanzai Kofun and the position of the wooden bridge for crossing the moat during the funeral rites.

Discussion on orientation

Let us stress once more that kofun tumuli have been built also using natural topography, and therefore the use of Spaceborne Digital Elevation Models based on Multiple Satellite Data Sets is fundamental investigating the specific topography and the related orientation of the structure.

<https://it-it.topographic-map.com/map-1171b3/堺市/?zoom=15&base=5¢er=34.56085%2C135.48788>

See further discussion in <https://zenodo.org/records/14677142>

In the discussion proposed above, we have shown some of the several kofun of which Japan is rich. We have encountered pits and corridors, and tumuli with more than one burial chamber. Then, what we find in MDPI, that “all Kofun entrance corridors” are facing sun or moon, is NOT true, since there are kofun with pits, without corridors. The Daisenryo kofun has a stone coffin in the round part. It is a PIT-style burial chamber tumulus. No corridor is attested. Then, what told in phys.org, “the Daisen Kofun is oriented towards the Sun rising at the winter solstice”, is NOT true.

We have seen in literature that we have to distinguish at least two periods for the building of the double mounds, today known as keyhole kofun. In the first period, we have a structure made by two mounds, with a burial pit at the center of the round rear part, and a subsidiary chamber in the front square part (an example is the Daisenryo kofun). In the second period, the pit in the round part is substituted by a chamber with a corridor (in fact, more chambers can be present in kofun too). Therefore, when we must consider the orientation of the double mounds, we must distinguish them at least according to these two main periods.

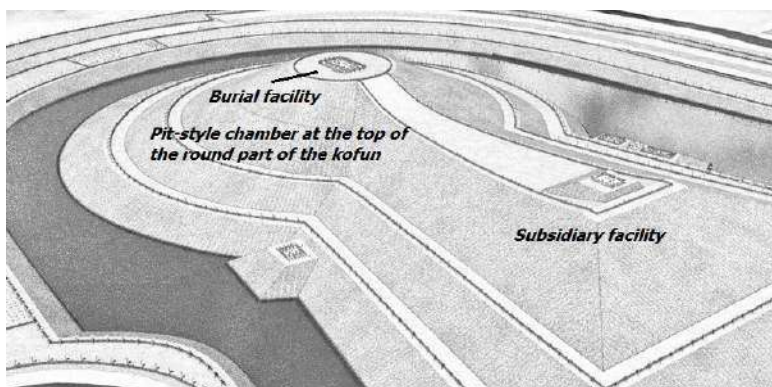


Fig. 20 - An image adapted from beautiful Figure 2-11 of Monuments and Sites Division, Agency Cultural Affairs, Mozu-Furuichi Kofun Group Mounded Tombs of Ancient Japan, Volume 6. The caption tells “Virtual reconstruction of a kofun to the

time of its construction (Ojin-tenno-ryo Kofun)”. It is available at the following link https://www.bunka.go.jp/seisaku/bunkazai/shokai/sekai_isan/ichiran/pdf/r1419077_06.pdf. We can see the burial facility, under which there is the burial pit with the sarcophagus, has the same orientation of the symmetry axis of the kofun. The same we can see in the Photo 2-3 of the above mentioned volume. The caption tells “An oblong chest-shaped stone coffin in a pit-style stone compartment dug into the top of the mound”. And the same in the Figure 3-1 of volume 8 too, with caption “Earthen constructions with distinctive appearances”. Many thanks to the Monuments and Sites Division of the Agency of Cultural Affairs for its precious documents on Kofun.

Emperor Ōjin 応神天皇	270–310 (40 years)
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His son was Emperor Nintoku

In the first period, the main axis of the kofun, that is the axis of symmetry must be considered, because it is the only one existing. The front of the kofun is considered its square side. So, if the symmetry axis is due to the North, the kofun is oriented to face South. The burial chamber seems to have been oriented according to the symmetry axis, as shown in the illustrations of the volumes of Monuments and Sites Division, Agency Cultural Affairs. However, we have seen the case of the Kurozuka kofun, Nara, which is facing west, but its burial pit, narrow and long, is oriented along the north-south axis. Then, the position of the body was that of kitamakura. In the same Nara area, there is the Sakurai Chausuyama kofun, which its axis due to the North, facing South, with a burial chamber which is oriented parallel to the axis of the kofun. Again, we find the kitamakura. As stressed by Akira Goto, the burial chamber can have a different orientation from that of the axis.

In the second period, the structure remains that of a double-mound, and the main axis needs to be considered too. However, we have a corridor added inside. Is it true that the corridor is (*more or less*) always perpendicular to this axis? This is a question to solve. If it is perpendicular, what is its direction, to the left or to right of the symmetry axis? Explicitly, if the symmetry axis is due to North and the main side facing South, is the corridor facing the sunrise on East or the sunset on West? If the symmetry axis is due to East and its main side facing West, is the corridor facing South? It seems so, because of geomancy. However, the answer is in the Japanese literature on Kofun for sure. From satellite images, it is very hard to understand where the entrance of the corridor is. An observer must use Google Earth in the Street View, if possible, and move around the kofun, and carefully inspect its surface. And the observer must do this for many of them. And remember that we have kofun with pit-style burial chambers, and therefore, no corridor is present and no corridor entrance.

For what concerns the orientation of the burial chamber, see please Akira Goto (2018). In Goto, 2018, we find the “northern pillow” and the “southern aspect” mentioned.

As we have seen, <https://zenodo.org/records/14677142>, the archaic funerary rites took a very long time, during days and nights. In this complex ritual, had the orientation of the

tumulus a specific meaning, or was only the orientation of the burial chamber relevant? According to Yoshitaka Hojo, the burials were characterized as “northern pillow” (kitamakura). Then, it seems that it is the orientation of the burial chamber, the orientation which is the fundamental one.

For what concerns the sun, we can see that kofun are mainly facing the south and west directions according to Saito Tadashi. Are these orientations linked to Amaterasu, the kami of Yamato? This is a further question, because it seems that the myths about this sun goddess are a late elaboration with respect to the Kofun period.

Once more. In the MDPI article by Baratta et al, 2022, we read “The study of the orientation of ancient tombs is usually a powerful tool to better understand the cognitive aspects of religion and power in ancient societies. This study has never been carried out in Japan due to the very large number of Kofun and to the fact that access to the perimeter is usually forbidden”. IT IS NOT TRUE that the “study [of the orientation] has never been carried out in Japan due to the very large number of Kofun”. WE HAVE RESEARCH MADE by SAITO TADASHI, who studied an even larger number of kofun. IT IS NOT TRUE that the “access to the perimeter is usually forbidden”. There are kofun that can be visited, even inside. MDPI article continues “For these reasons, to investigate Kofun orientations, simple tools of satellite imagery are used here. Our results strongly point to a connection of all Kofun entrance corridors with the arc of the sky where the Sun and the Moon are visible every day of the year”. NO, it is NOT TRUE that ALL KOFUN HAD A CORRIDOR. KOFUN HAD PIT-BURIAL CHAMBERS TOO. Moreover, there is no rule saying that the corridor was perpendicular to the axis of the kofun, and there is no rule that it was always on the right (or left) of the symmetry axis.

Baratta and coworkers are linking the kofun to Amaterasu. Then, IT IS NECESSARY to report from Duthie, T. (2014). *Man'yōshū and the imperial imagination in early Japan* (Vol. 45). Brill. “... as Naoki Kojiro argued over sixty years ago, the absence of ‘Amaterasu’ from the *Nihon shoki* text between the reigns of Jingu and Tenmu strongly suggest that it was ONLY FROM Tenmu’s reign onward that the regional Ise sun cult became identified with a specific sun deity name ‘Amaterasu’ and that this sun goddess came to be worshipped as a divine ancestor of the ruling line. A somewhat different view, which was first proposed by Okada Seishi, agrees that the imperial cult to Amaterasu was probably established as in Tenmu and Jito’s reigns, but argues that Ise was the site of a royal Yamato ancestor sun cult (as opposed to being simply a regional cult) from as far back as Yuryaku’s reign in the fifth century. My own view is closer to that of Naoki, but for my purposes here what I would like to emphasize is the broad agreement over the theory that the Ise cult of a sun goddess called Amaterasu who was ancestor of the imperial house was established during Tenmu’s reign (note 8)”. Note 8: “This understanding is also shared by the vast majority of studies written on the topic since Naoki and Okada. Takatori Masao, for instance, argues that the Ise shrine did not establish itself as the supreme ancestral shrine of the imperial family until the late eighth century. ... It is unfortunate that English language scholarship on this topic had been strongly influenced by Matsumae Takeshi’s article ... Matsumae ... manages to omit any mention of the historical aspects of Okada’s argument” (Duthie, 2014).

<p>Emperor Yūryaku 雄略天皇 Ōhatuse no Wakatakeru no Sumera-mikoto 大泊瀬幼武尊天皇</p>		<p>456–479 (23 years)</p>	
<p>Emperor Tenmu 天武天皇 Amanonunaharaokinomahito no Sumera-mikoto 天渟中原瀛真人天皇</p>	<p>673–686 (14 years) Shuchō</p>	<p>Empress Jitō 持統天皇 Takamanoharahiro no hime no Sumera-mikoto 高天原広野姫天皇</p>	<p>687–697 (10 years)^[vi]</p>

The Daisenryo kofun is considered the tom of Emperor Nintoku.

<p>Emperor Nintoku 仁徳天皇</p>	<p>313–399 (86 years)</p>
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The cult of Amaterasu as ancestral kami of the imperial family was established quite after the building of Nintoku’s kofun. The cult was established at the end of the kofun period. The Ise Shrine is located in Ise, Mie Prefecture of Japan.

Concluding, in the MDPI paper we find assumed that all the analyzed kofun have a corridor, but this is not true because we have pit burial chambers too (Mozu Group). It is not true that Japanese scholars have not studied the orientation of kofun. Saito Tadashi studied a larger number of kofun. The link of kofun to Amaterasu is questionable, since scholars are arguing about establishment of Amaterasu’s imperial family cult at the end of kofun period.

Further information

tateana sekishitsu (vertical style stone chamber)

https://emuseum.nich.go.jp/detail?langId=en&webView=null&content_base_id=101147&content_part_id=27&content_pict_id=0

“The Higashinomiya Tumulus is a 78-meter-long, front-square and rear-square mound (J., zempo-koho-fun) on Mount Hakusan in Inuyama City, Aichi Prefecture. From a vertical style stone chamber (J., tateana sekishitsu) in the rear mound, various artifacts were discovered. ... These artifacts are indispensable for the study of the Tokai area in the early Kofun period (ca. 250-ca. 600).”

In early Kofun, the burial chamber was often a vertical pit (tateana sekishitsu) dug into the top of the mound's circular part. Access was from above. No corridor.

The nominated property, that is the Mozu Group

https://www.bunka.go.jp/seisaku/bunkazai/shokai/sekai_isan/ichiran/pdf/r1419077_06.pdf

“Description of the property as a whole. Overview. Mozu-Furuichi Kofun Group is a tomb

group composed of 49 mounded tombs, which densely concentrate in the Mozu and Furuichi areas on the top of a plateau in the southern part of Osaka Plain which was one of the political and cultural centers of the ancient Japanese archipelago. The property faced a bay which was a maritime gateway to continental Asia. Even among the numerous tomb groups that exist in Japan, the nominated property is an outstanding example of a group with a variety of mound shapes and a wide range of sizes, and it was extremely influential in the construction of kofun in various regions of the archipelago”. (www.bunka.go.jp)

Nintoku-tenno-ryo (repetita iuvant), Ojin-tenno-ryo kofun and other kofun of the Mozu Group

https://www.bunka.go.jp/seisaku/bunkazai/shokai/sekai_isan/ichiran/pdf/r1419077_06.pdf

“are particularly gigantic, having required an extraordinary scale of civil engineering work; the former’s mound is 486 m long, 35 m high ..., while the latter is 425 m long, 36 m high They are the largest and second largest kofun in Japan. It is believed that careful designs and precise measurements, construction technology based on a certain civil engineering, as well as comprehensive construction management capability ... A burial facility was dug into the top of the mound of each kofun, and haniwa and paving stones were placed along the mound surface. The fact that funerary rituals took place on the mound and that the mound was made to be a glorious platform were major features of the kofun of the Japanese archipelago. **The nominated property clearly demonstrates this.**”

“The burial facility. Each of the kofun comprising the nominated property has a burial facility directly related to the burial of a body, and it is thought that apart from a few exceptions, many of them are still in their original positions. ... The burial facilities of the component kofun of the property, shown below, include all of the various types of burial facilities belonging to the Middle Kofun period, which was the peak of the Kofun period.”

“The location: **The burial facility consists of a pit that was dug from the top of the mound when it was largely completed,** and a coffin and a compartment (kaku) that were installed within it (see Photo 2-3). While mounded tombs in other parts of the world usually involved a construction process in which burial facilities were first built and then covered with piles of earth, kofun on the Japanese archipelago, where burial facilities were dug into the mound top during the final stage of construction or after construction had completed, are very distinctive in the way burials were conducted and how the mounds were used (see 3.2 “Comparative Analysis”)”. “The coffin and compartment: The body of the deceased was interred in a stone or wood coffin, which was then often placed in an outer compartment. Coffins include oblong chest-shaped, boat-shaped and box-shaped examples. The burial compartments are of two types: a stone compartment with stones piled up around the coffin, and a clay encasing around the coffin. Compartments were mainly used as the burial facilities of large-scale tombs, while in many of the small-scale tombs, a wooden coffin was placed directly into the grave pit”. (www.bunka.go.jp)

The Mozu Gropu kofun have grave pits, NO corridors. Look at the Figure 2-22, of the document, which is showing “Nintoku-tenno-ryo Kofun at the time of its construction (aerial view, CG image of virtual reconstruction)”. Note the burial pit at the top of the round part of the kofun.

“Tsudo-shiroyama Kofun is a keyhole-shaped mounded tomb located in the most northern part of the Furuichi area. The square front part was constructed facing southeast, so it is thought that it was intended to be viewed from the Osaka Plain. ... The burial facility,

which was discovered at the upper part of the round rear part in 1912, is a pit-style stone compartment containing the largest chest-shaped stone coffin ever discovered in Japan. The ceiling stones of the chamber were removed at the time of discovery; they are currently displayed in the guidance facility”. (www.bunka.go.jp)

“Komuroyama Kofun is a keyhole-shaped mounded tomb constructed on the western edge of the projected plateau, running north-south. Its square front part faces northeast. ... It has been noted that the burial facility may have been a pit-style stone compartment, given the stone materials that were found scattered on top of the mound”. (www.bunka.go.jp)

“Ojin-tenno-ryo Kofun is a keyhole-shaped mounded tomb located on the western edge of the projected plateau, running north-south. The mound is the second largest in Japan. Its square front part faces north. Close to the moat, Konda-maruyama Kofun and Futatsuzuka Kofun were constructed to be integrated with Ojin-tenno-ryo Kofun. As these three tombs are located in the same site, they are treated as a single component part. ... The mound length is 425 m, and the height of the round rear part is 36 m. While the mound of Nintoku-tenno-ryo Kofun is larger in length, this tomb has the greatest mound volume. The mound was constructed in three tiers, and apart from the collapsed part at the square part’s northwest side, its original shape from the time of its construction has been well preserved. ... A square stage was built atop the square front part. There is a record indicating the exposure of a pit-style stone compartment near the top of the square part, and it is possible that the burial facility was built inside this platform.” (www.bunka.go.jp)

“The burial facility of Tsudo-shiroyama Kofun employed a combination of an oblong chest-shaped stone coffin within a pit-style stone compartment, which became prevalent in the Middle Kofun period (Figure 2-89), and its grave goods included a new type of iron armor ... Kofun construction is regarded to have entered into a new stage following the appearance of such new elements in the giant kofun of the Osaka Plain. The construction of Tsudo-shiroyama Kofun is thus thought to mark the start of the Middle Kofun period (Figures 2-91 and 2-92).” (www.bunka.go.jp)

Rōji Kofun, Fukuoka

<https://aroundus.com/p/11773600-roji-kofun> “ Built between the 5th and 6th centuries, this burial mound belonged to a local ruler or noble person during the Kofun period of Japanese history”. “At the Roji tomb in Fukuoka prefecture, a keyhole tumulus ..., there were four interments, three of which upon first inspection appeared to be ordinary vertical-entrance chambers. As archaeologists excavated”, they found a pathway linking the largest burial chamber to an opening on a side of the kofun. The mourners “could enter and add coffins later”. “In other words, onto the basic structure of a vertical-entrance chambers engineers had evidently grafted a side door (tateana kei yokoguchi shiki sekishitsu)”. This tumulus and others like Sukizaki kofun “foreshadowed a significant shift in the tomb-building in Japan. The new corridor and chamber (yokoana shiki sekishitsu) tombs could all be entered from the side, allowing mourners to reopen the tomb in ordered to add more coffins. ... most scholar insist that the stone corridor and chamber tomb is another Chinese invention” (Farris, 1998).

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