

# Direction and Orientation of Prehistoric Graves: New data from the North Coast of Java

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## ABSTRACT

The direction and orientation of prehistoric graves in Indonesia have not been widely studied. Some research on prehistoric graves does not explain the direction and orientation in detail. This research on the direction and orientation of prehistoric tombs in the North Coast of Java aims to answer the question of why the direction towards the prehistoric graves in the North Coast area of Rembang Regency, Central Java Province is to the Northeast - Southwest and the direction towards the prehistoric graves in the North Coast area of Sampang Regency, Madura to the Northwest – Southeast. The two directions facing the grave above in Indonesia are rarely found and there has been no research on this case. The method applied in this study is to measure azimuthally using a compass to find out how many degrees the position of the grave is either (North to East) for graves in Rembang Regency and (North to West) for graves in Sampang Regency. The results of the measurement of the direction facing the North Coast area of Rembang N 15°-25° E and N 10°-45°W are the direction facing the grave in the North Coast area of Sampang Regency. Both directions above are oriented towards the Java Sea. The two directions above meet at a point that is concluded as the location of the origin of the buried people so that when they die their spirits will return to their place of origin.

**Keywords:** Facing Direction, North Coast of Java, Prehistoric Graves.

## 1. INTRODUCTION

In prehistoric societies, the concept of belief in supernatural powers was known in natural objects both in space and on land. For example the Sun, Moon, and towering mountains. Belief is based on human belief in the power of these objects. As believed by the Egyptians, Greeks, Romans, and Chinese. In Egypt, they believed in Ra or Re (the sun god). Besides the Sun, another celestial body is the Moon, which has also been of concern to prehistoric people. In Greek mythology, Helios is known as the sun god and Selena is the name of the moon goddess, and in Roman mythology the moon goddess is called Luna. Prehistoric people in China called the Sun god Ri Shen and Yue Shen for the Moon goddess. This belief in the Sun God and Moon Goddess continued until historical times, as Hindus believe, they know Dewa Surya and Dewa Chandra. Belief in celestial bodies such as the Stars, Moon, and Sun was also believed by people during the Prophet Ibrahim AS as stated in Al Qur'an Surah 6 verses 75-78.

In addition to believing in celestial bodies, prehistoric people also recognized the belief in the power of natural objects such as towering mountains. Belief in the power of mountains seems to be universally found in Europe. Wales (1954) explains in a book entitled The Mountain of God, that the top of the mountain is the abode of the gods and spirits of the ancestors. Therefore, it is not surprising that there is a group of people who think that the top of the mountain is a sacred place for the gods and is a bridge that connects the underworld and the upper world. In addition to the concept of belief in the Sun as a symbol of the journey of human life from birth-death - to life again in the spirit realm and the Mountain as the abode of gods and ancestral spirits, for prehistoric people, especially those living in coastal areas, they believed that their ancestors came from across the sea and when they die their spirits will return to their original place across the ocean.

Referring to the concept of universal prehistoric community belief above, in Indonesia, there are also many graves from prehistoric times with facing

directions and orientation to objects as mentioned in the paragraph above. In Indonesia, in general, prehistoric graves and monuments with a direction facing East-West are associated with the sunrise and sunset positions, such as stone coffin graves at the Cipari Site, Kuningan, West Java, Sokoliman Site, Gunung Kidul, DIY, and the Kalang Gravesite, Bojonegoro, East Java. Meanwhile, megalithic sites such as those found in Matesih, Karanganyar Regency, Central Java, which are located on the slopes of a mountain by researchers are associated with the peak of the mountain, namely Mount Lawu. Watu Kandang (prehistoric graves) were found scattered on the western slopes of Mount Lawu, Karanganyar Regency, Central Java, originally by the researchers the direction and orientation were Mount Lawu (Nitihaminto 1978). However, in subsequent research, data were found that explained that the direction towards and orientation of the tomb built on the western slope of Mount Lawu above had nothing to do with the peak of the mountain in question. The direction towards the Watu Kandang grave tends to be Southeast – Northwest, and orientation towards the sunrise position (Gunadi 1994a; 1994b).

The results of the research on the direction and orientation of Watu Kandang above are new data for the development of prehistoric archaeological research in Indonesia. Apart from not finding any Watu Kandang facing and orienting towards the top of Mount Lawu, the direction towards and orientation of the prehistoric tombs above can explain that Watu Kandang is the second type of burials (secondary burials) that were built when the Sun was in the position on the Troops. The direction and orientation of prehistoric tombs in Indonesia seem to still have various research questions that invite researchers to conduct a more sharp and in-depth study both academically and practically. In this regard, research on the direction and orientation of prehistoric graves found in the North Coast of Java is very interesting to do. Because, at a glance, it can be seen that the direction towards the prehistoric tombs found in the North Coast area between the Lasem and Kragan sub-districts, Rembang district, Central Java is Northeast – Southwest, while the direction towards the prehistoric graves found in the North Coast area, Sokobanah District, District Sampang, Madura towards the Northwest - Southeast. The problem of facing azimuthally opposite directions between prehistoric graves in the North Coast area of Rembang Regency and prehistoric graves found in the North Coast area of Sokobanah District, Sampang Regency, could there be a common orientation? Another problem that will be studied is who is the human figure who is buried, does it have anything to do with the immigrants who speak the Austronesian language family who came to Java?

Academically, the purpose of this research is to prove whether there is a relationship between the

direction and orientation of prehistoric tombs in the North Coast of Java with certain natural objects or objects such as the sun and mountains or other objects that are targeted from the direction facing the graves. Practically speaking, this research aims to find out the origins and history of humans buried in the North Coast of Java. In connection with the research objectives above, the benefits of the research results can be divided into two, namely: academic benefits, including the discovery of new data regarding the direction and orientation of prehistoric graves in Indonesia. Practically, the results of this study will support people's understanding of the diversity of the Indonesian nation that is interwoven in one origin and the history of the Indonesian nation.

## **2. METHOD**

In this study, data collection methods were used, including surveys to find the existence of prehistoric gravesites. Then carry out excavations looking for factual data such as human skeletons and other artifacts. To collect data related to the direction and orientation of this prehistoric tomb, equipment such as a Suunto compass, protractor, and map were used. Measuring the facing direction of megalithic monuments like this refers to the method proposed by David Fraser, namely the study of the direction and orientation of megalithic monuments by considering azimuth. This method borrows from Ruggles' opinion which states that determining the direction and orientation of a prehistoric building structure can be done with three considerations/reasons, namely: 1. Astronomical reasons, 2. Azimuthal reasons, and 3. Field-based reasons (Fraser 1988).

## **3. PREHISTORIC BURIAL SITES IN THE NORTH COAST OF JAVA**

The North Coast of Java in this article is from the eastern part of Rembang Regency, Central Java Province to the east to Sumenep Regency, East Java Province. The results of the study along the North Coast of Java found prehistoric gravesites, namely as follows.

### **3.1. Binangun Site**



**Figure 1** Location of Binangun Site (Gunadi, 2012).



**Figure 2** Human skull of Binangun (Gunadi, 2012).

### 3.2. Leran Site

The Leran site is located in the coastal area of Binangun, Binangun Village, Lasem District, Rembang Regency, Central Java Province (Figure 1). What is interesting about the findings of Binangun's skull is the shape of the four upper incisors which are similar to saw blades (Javanese: *untu walang*). This modification of the shape of the teeth (Figure 2) is found in several places both in Indonesia and outside Indonesia, such as in Mentawai and Congo, Africa (Kasnowihardjo et al., 2013). Modified teeth with other forms were also found in the human skull Leran (Figure 3), Which in Romero's classification is referred to as a type 3c tooth modified culture (Williams and White 2006).



**Figure 3** Modification of Leran's human teeth (Source: Gunadi et al. Archaeological Research Report on 2012).

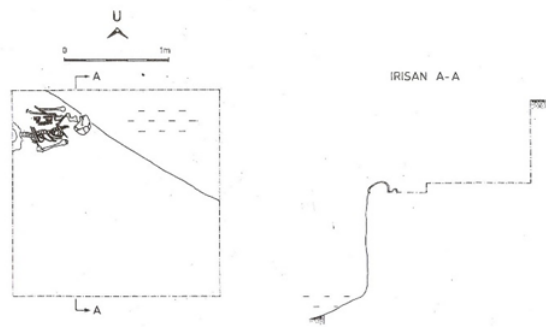
Approximately 1 km to the east of the Binangun Site, a research team from the Yogyakarta Archeology Center found fragments of human skeletons that have sprung up on the shoreline due to periodic abrasion in the coastal area along between Lasem and Sluke. This incident seems to have been going on for years, this is indicated

by the discovery of skull fragments and human skeletons scattered on the beach of Leran Village, Sluke District, Rembang Regency, Central Java. Based on the findings of the survey results in the Leran coastal area, it was concluded that the area was a past burial site. The results of the 2013 study found several human skeletons buried in a longitudinal position with a direction facing northeast-southwest and orientation (head position) towards the Java Sea (Figures 4, and 5). Based on the measurement of the angle of inclination (based on the compass direction of North to East), one of the directions towards the Leran grave is N 30° E (Figure 4).

The human skeletons of the ancient tomb site of Leran were buried in a north-south burial orientation, with the head positioned towards the north. Technically, burials at the Leran Site represent a single primary burial. The orientation of the burial with this head position is very interesting because it is oriented towards the sea which in some traditional Austronesian communities is believed to be the direction of their ancestors' arrival. In addition, the position of the corpse is tilted to the right (west) towards the Kaaba, with the position of the two arms crossed and both placed on the chest. This position of the corpse is reminiscent of the funeral tradition of people who embrace Islam. This raises the problem of cultural chronology because the results of the previous dating with charcoal samples using the C14 method resulted in an age of  $2640 \pm 160$  BP (1950 AD) or 2500 BP (Gunadi, 2012).



**Figure 4** Human skeleton fragment of Leran site (Kasnowihardjo et al., 2013).



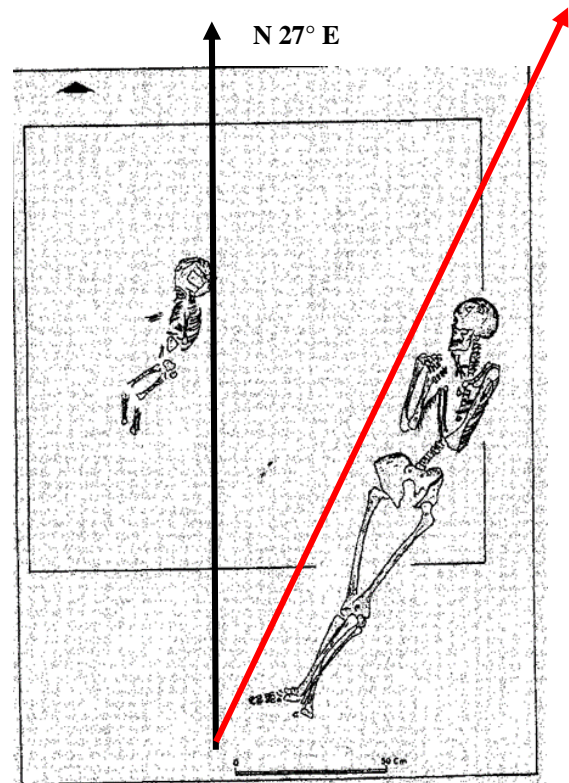
**Figure 5** Position of the human skeleton found at the Leran Site (Kasnowihardjo et al., 2013).

### 3.3. Plawangan Site

Excavations at the Plawangan Site in 2016 succeeded in finding two human skeletons in a longitudinal position and a concentration of bones mixed with pottery shards. The two human skeletons, one of which is an adult human facing N 20°E and a juvenile N 25°E (Figure 6). While the concentration of bone and pottery, it is estimated that the bone fragments of children are approximately 9 years old (Gunadi, 2018). The finding of two longitudinal skeletons at the Plawangan Site above is similar to the results of a study conducted by the National Archaeological Research Center in the 1980s (Figure 7).



**Figure 6** The direction of the human skeletons result of the excavation of Yogyakarta Archaeological Center is between N20°E and N25°E (Gunadi, 2018).



**Figure 7** Human skeletons results of the research/excavation of the National Archaeological Research Center of Plawangan Site (Prasetyo 1994).

### 3.4. Bandaran Timur Sites

These two sites were discovered when the research team from the Yogyakarta Archeological Research team conducted research: Looking for Traces of Austronesian Culture in the North Coast Region of Madura Island in 2021. These sites are located in Tamberu Timur Village, Sokobanah District, Sampang Regency, East Java Province. These sites above are thought to be past burial complexes because until now no one knows about the history and stories of the graves. The objects found at that site above are rectangular stone structures of varying sizes. In general, the stone arrangement is 205 cm long, 105 cm wide, and 10 cm high, this form is a grave sign for one individual (Figure 8).



**Figure 8** The layout on one of the stone graves at the Bandaran Timur site, as a sample for excavation.

Azimuthally, the direction of this gravestone is Northwest - Southeast although only 10 degrees shifted from north to west.



**Figure 9** The position of the stone grave before lifted.



**Figure 10** Excavations can be carried out by opening an excavation box measuring 2 m x 2 m and its extension.

#### 4. DISCUSSION

In general, there are several opinions regarding the direction and orientation of prehistoric tombs, including Wales (1954) states that the direction and orientation of Megalithic monuments are generally to the top of the

mountain. This is based on the beliefs of the people at that time they believed that the top of the mountain was the abode of the gods and the spirits of their ancestors. So that the ancestral spirits can go to the abode of the gods, their graves are directed to the top of the mountain. It is further explained that in China around 300 BC there was a belief that the sky was considered the home of death so that the top of the mountain was used as a connecting symbol between the earth and the sky (Wales 1954). In the megalithic society, they believe that the towering mountain is the axis that connects the earth and the sky.



**Figure 11** A boat-shaped grave marker in the Batanes Islands, Philippines (Valientes, 2019).

In addition to being oriented to the top of the mountain, some scholars connect the direction towards and orientation of prehistoric graves with the direction of the sun's journey (Soejono 1971). The discovery of the myths of the sun in several places in Indonesia shows the existence of a cult of the sun god (Perry 1918), but this is still doubtful (Hoop 1934). Wales (1954) guidance does not seem to apply when applied to the Watu Kandang gravesite found on the western slope of Mount Lawu, Karanganyar Regency, Central Java Province. The results of the research on the direction towards and orientation of the Watu Kandang graves stated that none of the Watu Kandang graves were facing and oriented towards the top of Mount Lawu, the highest mountain in the Watu Kandang site area (Gunadi 1994a). The same case was found at stone coffin gravesites in the Gunung Kidul Regency, Daerah Istimewa Yogyakarta Province. In general, the direction of the stone coffin graves at the Gondang, Bleberan, and Sokoliman sites is east-west. Because in the area of the three sites there are no towering mountains, the orientation is based on the direction facing the grave of the stone coffin above, not to the top of the mountain. The results of azimuth measurements at the Sokoliman Site are estimated that the direction and orientation of the gravestone coffin at the Sokoliman Site is towards the sunrise when the Sun is on the Tropic of Cancer (Kasnowihardjo, 2021b).

In contrast to the opinion above, people who live in coastal areas or on remote islands, believe that the abode

of their ancestors' spirits is across the ocean. Therefore, in ceremonies related to death, such as during burial ceremonies, elements related to the sea will be found. In addition to the direction facing the grave which is oriented across the sea, the coffin is shaped like a boat which symbolizes the spirit of the dead who will cross the ocean to the place where the spirits of their ancestors reside (Stutterheim, 1931). Stutterheim's opinion is supported by the results of research on prehistoric graves on Vuhus Island, Batanes Province, North Philippines (Valientes, 2019). In the study, the tomb was found in the form of a stone arrangement shaped like a boat (see Figure 11). This paper illustrates that the boat-shaped stone markers at Vuhus represent a cosmological narrative, from the Austronesian-speaking community of the region, that describes the maritime journey of the spirits of the dead to the land of the dead by boat.

Graves facing and orientation across the ocean are found in the northern coast of Java, such as at the Leran and Plawangan sites, Rembang district, Central Java and the West Tamberu and East Tamberu sites, Sampang district, Madura, East Java (Kasnowihardjo 2013; Gunadi 2018; 2019). The grave data from prehistoric times above seems to strengthen Stutterheim's opinion about the belief of prehistoric people living in coastal areas or small islands believing that the spirits of the dead will return to their homeland across the ocean. Therefore, the direction towards the graves of the Leran and Plawangan sites, West Tamberu and East Tamberu towards the Java Sea.



**Figure 12** Imaginary lines facing and orientation of the Plawangan and Bandaran Timur site graves meet on Bawean Island (Kasnowihardjo et al., 2021).

Although the tombs of Leran and Plawangan as well as West Tamberu and East Tamberu are both oriented across the ocean, the directions towards them are opposite, namely Northeast for the tombs at Plawangan Site and Northwest for Tamberu Barat and Tamberu Timur graves. This case based on the author's observations is new and interesting data to be studied deeper. By taking measurements and making an

imaginary line in the direction of the two directions facing the grave above, it is known that the two imaginary lines intersect in the Bawean Island area. This implies that both the Leran and Plawangan people as well as the Tamberu Barat and Tamberu Timur peoples, before occupying the North Coast of Java and Madura, most likely live on Bawean Island. The two lines of imagination related to the direction and orientation of prehistoric tombs in the two areas above are the authors' hypotheses that support Stutterheim's theory and are similar to boat-shaped tombs found on Vuhus Island, Batanes Province, Philippines. Although the tombs on the northern coast of Java and Madura are not explicitly depicted as boats, the meaning of direction facing and orientation of the graves symbolizes the journey of the spirits of the dead across the ocean to the place of origin of their ancestors. Data on the discovery of the tradition of tooth modification in the Binangun and Leran humans show that they have adopted the Neolithic cultural tradition in about 5000 BC and lasted until the 20th century. In Indonesia the tradition of tooth modification is known in several areas, in Java, it is called pasah-pangur, in Bali known as the metatah ceremony, both are ceremonies that symbolize a girl has entered adulthood. Teeth modification traditions such as those found at the Binangun Site and the Leran Site are thought to be part of the tradition carried out by speakers of the Austronesian language family.

In addition to the direction towards the grave from the two sites above, Bawean Island, which is the only largest island in the Java Sea region (Central Java and East Java), led the writer to conclude that the direction towards the graves of the Leran and Plawangan sites, as well as the West Tamberu and Tamberu sites both easts, are oriented to Bawean Island. If this hypothesis is correct, it can be concluded that the graves at the Leran and Plawangan sites as well as the West Tamberu and East Tamberu sites are the graves of speakers of the Austronesian language family. On their journey for thousands of years from Taiwan to the North Coast of Java and Madura, they transited and occupied Bawean Island for a long time, so that in their religious concept it is believed that Bawean Island is the land of their ancestors. Thus, the next conclusion is that between people of Leran human descent and Plawangan humans and people of West Tamberu and East Tamberu human descendants, they are descendants of "Bawean humans". This is a small example of the diversity and unity of the Indonesian nation on a provincial scale. The descendants of Leran and Plawangan humans speak Javanese, while the descendants of West Tamberu and East Tamberu humans speak Madurese (Kasnowihardjo 2021a).

## 5. CONCLUSION

Tooth modification in Binangun and Leran humans shows the existence of a Neolithic cultural tradition that is identical to the culture brought by immigrants who speak the Austronesian language family. In Indonesia, this tradition until the twentieth century AD is still found in Java and Bali. Even the explicit modification of teeth as in Binangun humans is still carried out by a group of Mentawai tribes. The direction towards the graves at the Binangun, Leran, and Plawangan sites which at first glance point north-south is like the graves of Muslims after azimuthal measurements show that they are tilted towards the North-East. It can be concluded that the direction towards the graves at the Binangun, Leran, and Plawangan sites which tend to be northeast-southwest is not a grave from the Islamic era. Likewise, the direction towards the graves of the West Tamberu and East Tamberu Sites, Sokobanah District, Sampang Regency, Madura, East Java Province, in azimuthal N 10°-45° W is the Northwest-Southeast direction which is substantively opposite to the direction facing the graves at the site. Binangun, Leran and Plawangan.

The results of archaeological research with the theme: "Tracking the Traces of Austronesian Culture in the North Coast of Java" as described above, are academically very interesting new data for further, more comprehensive, and innovative studies and research. Practically speaking, the results of this study support the diversity and unity of the Indonesian nation. Research that is expanded and sharpened both synchronously and diachronically and collaboratively between Archaeological Centers that are close to each other, will produce innovative and useful formulations in supporting government policies. Things like this are very easy and the authors often say both formally and informally but are very difficult to do because each of the Archeology Centers has sectoral autonomy and egoism. Hopefully, with the establishment of the National Innovation Research Agency (BRIN), it will soon be operational in synergizing national-scale research activities including archaeological research which has been stalled at a local scale. Synergizing and integrating activities on a national scale are not easy, but with a strong legal basis, BRIN and researchers must be able to do it, because this is the demand of the nation and state.

## RECOMMENDATION

Concerning the conclusions above, several things can be recommended as follows:

1. This new hypothetical data needs testing and data support. Therefore, internally it is recommended to do further research, especially in Bawean Island and its surroundings.

2. The research theme Tracing the Traces of Austronesian Culture is proposed to be carried out nationally by each Archaeological Center so that BRIN and the National Archaeological Research Center will prepare (synergize and integrate) the research results of Archaeological Centers throughout Indonesia on a national scale align with Truman (2015).
3. With the role of the government of Rembang Regency, Sampang Regency, the Directorate General of Culture (Cq. Preservation Branch Office of Cultural Heritage of East Java Province), and the community around the sites above, they are expected to participate in the preservation of these archaeological sites.

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