

THE NEOLITHIC ARCHAEOLOGY OF TAIWAN AND THE PEINAN EXCAVATIONS

Chao-mei Lien*

Taiwan has long been considered a natural laboratory for various fields of research, such as anthropology, sociology and the natural sciences, due to its geographical location and the diversity of its ethnic groups, represented by the Austronesians and the different waves of Chinese immigrants from the historical era. The basic question of Austronesian origins has generally been considered a problem of linguistics alone. But since the Formosan languages of the Taiwanese aborigines are believed to be the *in situ* descendants of Proto-Austronesian, and thus to have the longest indigenous history of any of the Austronesian subgroups, an increased awareness has arisen of the importance of relating archaeological finds to the ancestries of existing aboriginal populations.

Most archaeologists agree that the Taiwan Austronesian speakers have an ancestry rooted in a cultural continuum that pre-dated the Christian era by several thousand years. But the archaeological and ethnohistorical data usually cited to support this belief are drawn normally from the sites of western and northern Taiwan. Eastern Taiwan has tended to remain a blank, despite its clear importance for questions of Austronesian prehistory. This paper has been written in an attempt to fill this blank.

NEOLITHIC ARCHAEOLOGY OF TAIWAN: THE WEST AND THE NORTH

Ninety-five years ago, the first reported archaeological site in Taiwan was found by a Japanese school teacher. It is now believed that there are more than one thousand archaeological sites located on Taiwan proper and on the surrounding isles. Based on the assemblages, C14 dates and stratigraphy as well as on comparative studies, archaeologists have divided Taiwan prehistory into cultural units which show significant differences through time and space. Figure 1, originally prepared by W.H. Sung and me (Sung 1980: Fig. 16), represents the first island-wide cultural sequence, albeit with a slight modification prolonging the beginning of the Peinan Culture as indicated by newly excavated material and C14 dates (Lien 1986). In addition, I now divide the last age (the Iron Age) into two periods: early Metal Age, referring to archaeological materials, and late Metal Age, referring to ethnological materials; the latter can also be classified as proto-historic.

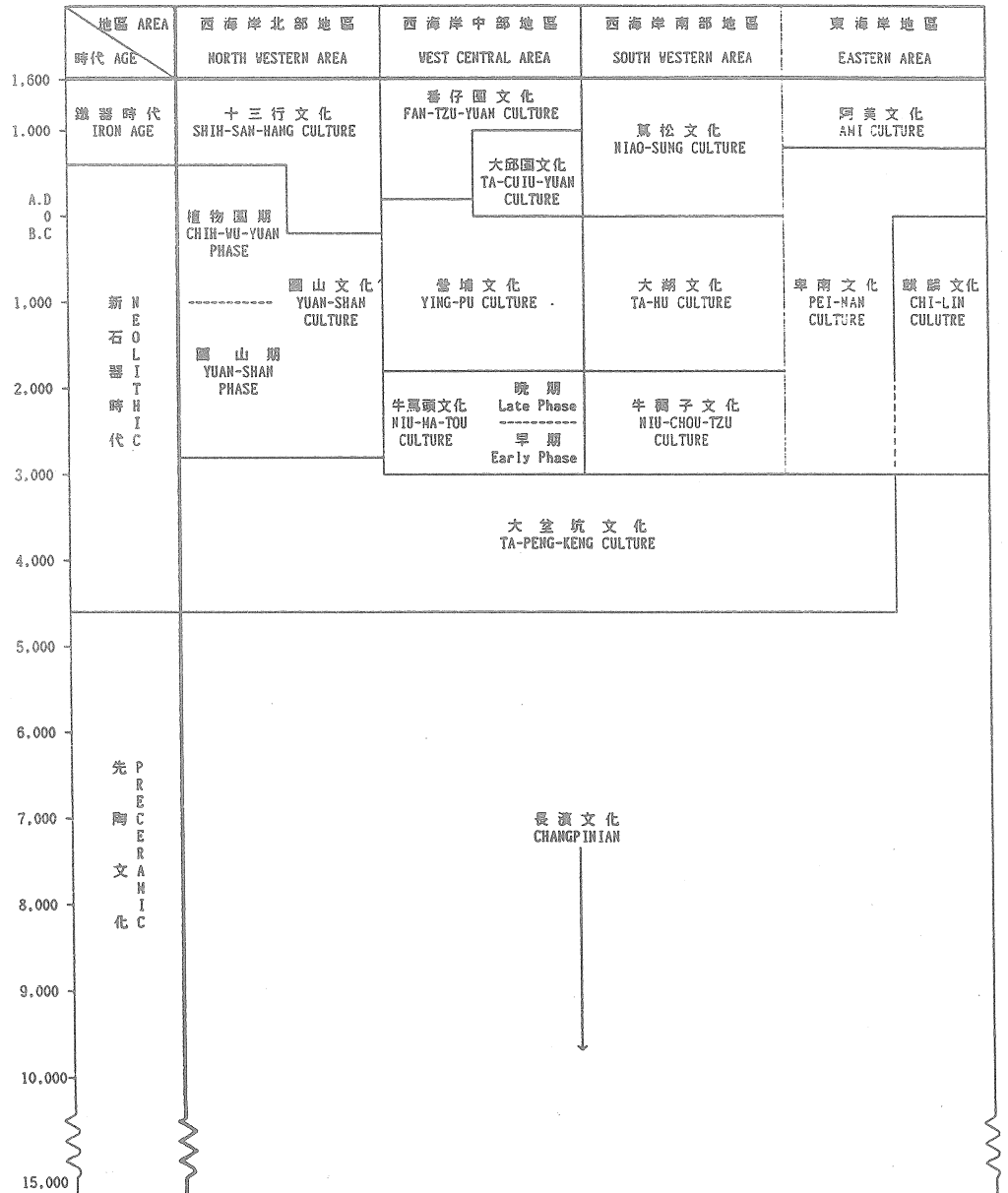


FIGURE 1: PREHISTORIC PHASES AND CULTURES OF TAIWAN

The oldest evidence for human activity in Taiwan is represented by a couple of fossil skull fragments and two fossil teeth from the bed of the Ts'ai-liao River, southwestern Taiwan, dated from 20,000 to 30,000 years ago by fluorine and manganese tests. There were no associated cultural remains (Lien 1981). However, assemblages of flake tools

and choppers have been found in caves on the east coast (Sung 1969) and in an open site at the southern tip of Taiwan (Li 1984). Radiocarbon dates indicate that the Preceramic Culture could have persisted until as late as 5000 BP, by which time the early Neolithic Culture had already appeared island-wide.

Neolithic archaeological sites are distributed throughout Taiwan and in the surrounding isles such as Penghu (Pescadores), Hsiao-liuchiu (Ryukyus), Lanyu (Botel Tobago) and Lutaó. In fact, more than 80% of the thousand sites estimated by Taiwanese archaeologists are Neolithic. The characteristics of the Taiwanese Neolithic can be listed as follows: a subsistence mode based on domesticated food production supplemented by hunting and gathering, a certain degree of sedentary residence, and the manufacture and use of elaborate polished stone implements, pottery, basketry and weaving. However, it is very interesting that there is still little evidence for animal domestication at any time during Taiwan prehistory.

The Tapengkeng Culture is recognized as the earliest Neolithic culture in Taiwan. It is mainly characterized by cord-marked pottery. Sites yielding cord-marked potsherds have been found intermittently around the entire circumference of the island and always from the bottom layer in stratified situations. Only one radiocarbon date is available for this culture, this being 5480±55 BP (SI 1229, old half-life), but the dating could be pushed back much further (Chang 1986:229).

Subsequent cultures clearly showed the prosperity of the Taiwan Neolithic. They include the Yuanshan Culture in the north, the Niumatou Culture in the west-central area, the Niuchoutzu Culture in the southwest and the Peinan Culture in the east. In fact, the Niumatou and Niuchoutzu Cultures were largely similar and could be combined into one cultural unit equal to K.C. Chang's Lungshanoid. All these cultures shared a similar subsistence pattern and technological level, but each also had its own characteristics as shown in pottery and tool types. Yuanshan is famous for its large-scale shell mounds. Its buff and sandy wares usually had two lugs and a spout or spouts, distinct from the cord-marked fine red pottery which lacked lugs. Tripods are common in the Niumatou-Niuchoutzu Cultures. In the stone inventory, the Yuanshan Culture was characterized by shouldered axes and stepped adzes but lacked stone knives. The Niumatou-Niuchoutzu Cultures, on the other hand, had various forms of stone knives and boot-shaped axes, but lacked shouldered axes and stepped adzes (Chang *et al.* 1969).

About 700 BC a new phase of the Yuanshan Culture appeared with different pottery and a disappearance of shouldered axes; this is named the Chihwuyuan Phase of the Yuanshan Culture. Overall, the Yuanshan Culture thus had a very long duration. Archaeologists (Chang *et al.* 1969; Bellwood 1979) agree with linguists (Ferrell 1966) that the people of the Yuanshan Culture were probably related to the Atayalic group of existing Taiwan aborigines.

It is obvious that the cord-marked fine red ware cultural horizon was the basic culture of the Neolithic in the west-central and southwestern areas. The later Yingpu and Tahu cultures are apparently local developments, but the cultural process is not clear. It has been suggested that the Lungshanoid Culture (the Niumatou-Niuchoutzu Cultures in this

paper) as a whole was related to the Paiwanic group of existing aborigines. However, because of the new data from Peinan I now have a different view of archaeological correlations with existing ethnographic cultures, as I will indicate later.

Before I present the section on Peinan, I would like to mention certain aspects of the archaeological data from sites of the early Metal Age in Taiwan. Such sites are mainly distributed along the northern and western coasts and coastal plains and seem to date from the beginning of the Christian Era. A number of these sites have been excavated recently; for instance, Shihsanhang in Taipei underwent its third term of excavation in 1990.

In eastern Taiwan the Ami Culture is the latest unit of prehistory, as postulated initially by Pearson (1969) from museum pottery data. More sites of this culture have recently been found along the east coast, but no excavations have yet been made (Lien 1986). This culture is assumed to belong to the direct ancestors of the existing Ami aboriginal population.

Early Metal Age assemblages from Taiwan are strikingly different from those of the Neolithic. Pottery has geometric patterns of decoration, the stone inventory shows a stagnation of technique (Sung 1980:138), there is no more tooth extraction and no jade industry. However, many new items appeared at this time, including iron-working together with implements and ornaments made of porous glass, agate, coal and gold (Liu 1989, and pers. comm. 1990). Burial methods were quite variable, including prone and extended in west-central Taiwan and flexed in the north, but slate slab graves ceased to occur (Sung 1980; Liu 1989). Such cultural characteristics are not only distinct from the Neolithic cultures but they also differ from the cultural inventories of the existing aboriginal groups. This has become an important issue which deserves further study.

NEOLITHIC ARCHAEOLOGY OF TAIWAN: THE EAST

Eastern Taiwan is geographically and geologically on the eastern edge of the Asian continent. The region is divided from western Taiwan by the central mountain range of the island and was only colonized by Han Chinese during the 19th Century. It was regarded by them as the area "behind the mountain".

The Neolithic sites of eastern Taiwan are characterised by the presence of megalithic construction, which was confined to this area, and the region has a very high density of slate slab graves with a great complexity of burial methods. The region is also very rich in jade artefacts. Megalithic constructions found in eastern Taiwan include upright stones of various forms, sarcophagi, stone slab walling techniques and stone rings. W.H. Sung believed that there were two different cultural units, namely the Chilin Culture and the Peinan Culture, existing parallel to each other during the Neolithic period (Sung 1980). However, the sites of both these cultures have similar portable artefacts. The only site in eastern Taiwan so far documented in much detail is that of Peinan.

The Peinan Site

The Peinan site is situated at 22°47' N and 121°06' E on the southern terrace of the Peinan River at the foot of the Peinan Hills, about 4.5 km northwest of Taitung. It was discovered at the end of the last century, carefully investigated by T. Kano in 1928 and 1929 (Kano 1930), and excavated by T. Kanaseki and N. Kokubu in 1945 on a very small scale (Kanaseki and Kokubu 1957). However, the site was not fully understood until 1980 when gravel mining operations commenced for the construction of a new railway siding. Since then there has been a series of archaeological salvage excavations.

Due to the enormous scale of the site and the demands for land for the railway station, a long term debate developed over the issues of construction or conservation. As a result, 13 seasons of salvage excavation were carried out from 1980 to 1989 by the Department of Anthropology, National Taiwan University, under the supervision of Prof. Wen-hsun Sung and myself. An area of 10,000 m² was explored by the archaeologists, adjacent to an area of 40,000 m² which was destroyed. Peinan was determined to extend as an archaeological site over 400,000 to 800,000 m². Thus, it not only became the site with the largest area excavated but it also proved to be the largest archaeological site in Taiwan.

The ten years of salvage archaeology can be divided into three periods: intensive excavations from 1980 to 1982, analysis from 1982 to 1986, and further excavation from 1986 to 1988 (Lien 1989a). As a result, enormous quantities of archaeological data were obtained and a project for establishing a museum at the site was initiated. The finds included numerous artifacts, at least 50 architectural units, 1,523 burials and 13,293 grave-goods, including about 4,000 artefacts of jade. Five excavation reports were completed and two have been published (Sung and Lien 1987, 1988). Towards the conclusion of excavation the Taiwan government accepted the suggestions of scholars and the mass media to establish a museum at the site. A further archaeological survey was conducted on the museum site and this led to the recovery of seven more burials (Lien and Sung 1989).

Two cultural strata are recognized in the site; corded pottery in the lower layers and the Peinan Culture in the upper and major deposit. Ten radiocarbon dates for the Peinan Culture fall between 2,300 and 5,300 BP, and seven cluster between 2,800 and 3,500 BP (Sung and Lien 1988:54-57). Thus, the date of the corded pottery stratum must be earlier than this. Based on the evidence of stratigraphy and the characteristics of the pottery, I believe the corded pottery stratum at Peinan corresponds with the Tapengkeng stratum in northern and western Taiwan, and that the Peinan Culture is parallel with the Niuchoutzu-Niumatou Cultures (Lungshanoid in K. C. Chang's terminology) in southwestern Taiwan and the Yuanshan Culture of the north.

The archaeological findings excavated from the Peinan Culture stratum give a very clear picture of Neolithic village life in eastern Taiwan. The pottery is a fine orange sandy ware, undecorated, low temperature fired and all hand (not wheel) made. The main types of vessel are a jar with a flaring rim and ring foot with vertical or horizontal handles, a small-rimmed vase with two vertical handles, a bowl with or without horizontal handles, plates, dishes, ladles and *tou*. Other earthenware artefacts include miniature pots, spindle

whorls, rings, "bark cloth beaters" and animal figurines. Pig, deer, and fish bones occur in the site, but there is as yet no evidence for the definite presence of domesticated animals.

The Peinan Burials

1,530 burials in graves lined with slate and schist slabs were excavated in the 14 seasons of work on the site. These burials ranged from fetuses to aged persons. Almost all were intact. Five types of grave could be recognised, three types being completely enclosed with slabs, one having no enclosure at all (or only a cover), and the last having only a slate enclosure for the head (so-called "head coffins"). These different types of graves were possibly used to distinguish societal, family or personal differences.

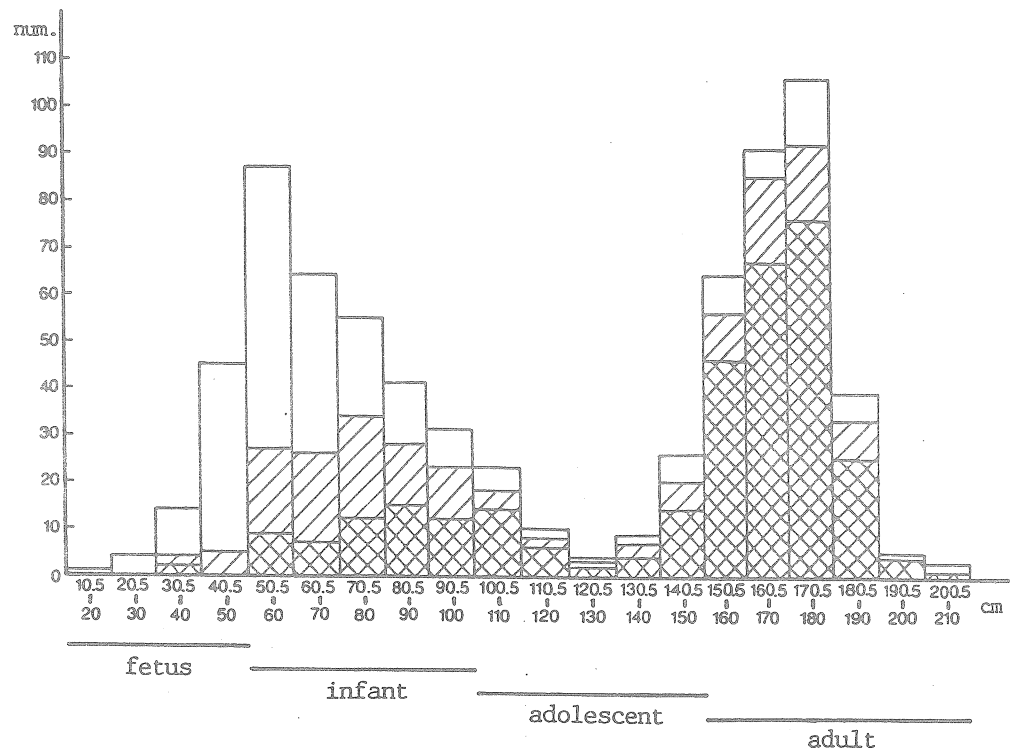


FIGURE 2: HISTOGRAM OF LENGTHS FOR A TOTAL OF 722 PEINAN SLATE SLAB GRAVES
In the columns, cross-hatched graves have goods (N=316), sloping line graves have no goods (N=158) and unhatched graves were found empty (N=248).

More than 21% of the excavated graves contained more than one skeleton, perhaps due to later opening and reuse. Most burials were extended with their heads towards the south and the length of the grave generally represented the age and stature of the person interred (Fig. 2). A significant point to be stressed is the high mortality of the foetal to infant stage. Fifty-two measured skeletons (Lien 1989:175) have a mean stature of 158.12

cm, with a range of 146-178.5 cm. Sixteen of these are identifiably male, with a mean stature of 163.22 cm (range 155-178.5 cm) and eighteen are female with a mean stature of 152.64 cm (range 146-167 cm). The Peinan people were quite tall compared to other measured skeletons in Taiwan; c.168 cm for the only male of Fengpitou, and an average of 160.72 cm for seven male skeletons from K'enting. The latter two sites are of the Niuchoutzu Culture and are probably contemporary with the Peinan Culture. Compared to extant aboriginal people these measurements are close to the taller groups, such as the Amis, Tsou and Puyuma.

Three customary traits, namely tooth extraction, betel nut mastication and head hunting, are evident from the Peinan burials (Lien 1989b:176-182). One other custom has been recognized without knowing its meaning, this being to place a large half pot over the face or head of the dead person. A study of tooth extraction has already been presented in another paper (Lien 1987). About 94% of the burial population had teeth extracted according to a fairly uniform pattern involving removal of the canine and second incisor on each side of the upper jaw. These four teeth were extracted at the same time for a single purpose in youth, perhaps for a rite of initiation. This trait is shared with all of the other local Neolithic cultures, except for those of Penghu Island. It is interesting to point out that the people of the early Metal Age in northern and western Taiwan practiced no tooth extraction. But some modern aborigines, especially those of north Taiwan such as the Bunun, Atayal, Saisiat and Tsou, practiced tooth extraction until very recently, albeit without adhering to a uniform pattern.

From a comparative viewpoint the Peinan pattern of tooth extraction is not paralleled in south China or Japan. It does occur in the Ban Kao site in central Thailand but in a lesser frequency, and no traces of tooth extraction have been observed in about 80 skeletons excavated at the famous Non Nok Tha site in northeastern Thailand. It seems that the study of this subject has not been emphasized by researchers in Southeast Asia.

Grave Goods - Slotted Earrings

About 75% of adult graves and 23% of infant graves yielded grave-goods, mostly of pottery, jade and slate (Fig. 3). The most common artifacts discovered were bell-shaped and tubular beads, slotted earrings, bracelets, pendants, adzes, spear and arrow heads, pottery vessels, spindle whorls and pieces of jade waste. Of these items, the slotted earrings are particularly interesting since they have long been used as evidence for diffusion or population migration around the South China Sea (Kano 1952; Huang 1975; Solheim 1984; Aoyagi 1986; Sung 1989). A total of 1,328 of these earrings was found in the excavated burials and almost all were complete. 441 of the total of 693 graves provided with goods yielded these earrings, so the item was clearly a basic offering for the dead, especially for adults.

Except for 30 slotted earrings made of slate the majority are of "Taiwan jade" (nephrite), serpentine and serpentinite, as in other Taiwan prehistoric sites. None were made of fired clay, glass, shell or metal, as sometimes occur in the Philippines (Aoyagi 1986; Sung 1989: Fig. 3; Thiel 1986-7). The earrings were made by using sawing and

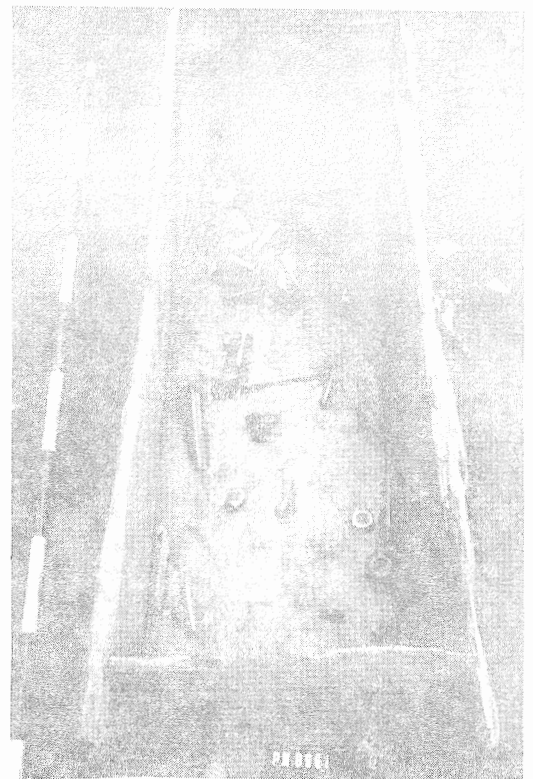


FIGURE 3: TOP, PEINAN MASS BURIAL (PN B2303) WHICH YIELDED 15 GRAVE POTS; BOTTOM, MASS BURIAL (PN B961) WHICH YIELDED MORE THAN 100 JADE ARTIFACTS, INCLUDING TUBULAR BEADS, SLOTTED EARRINGS, ADZES AND ARROWHEADS

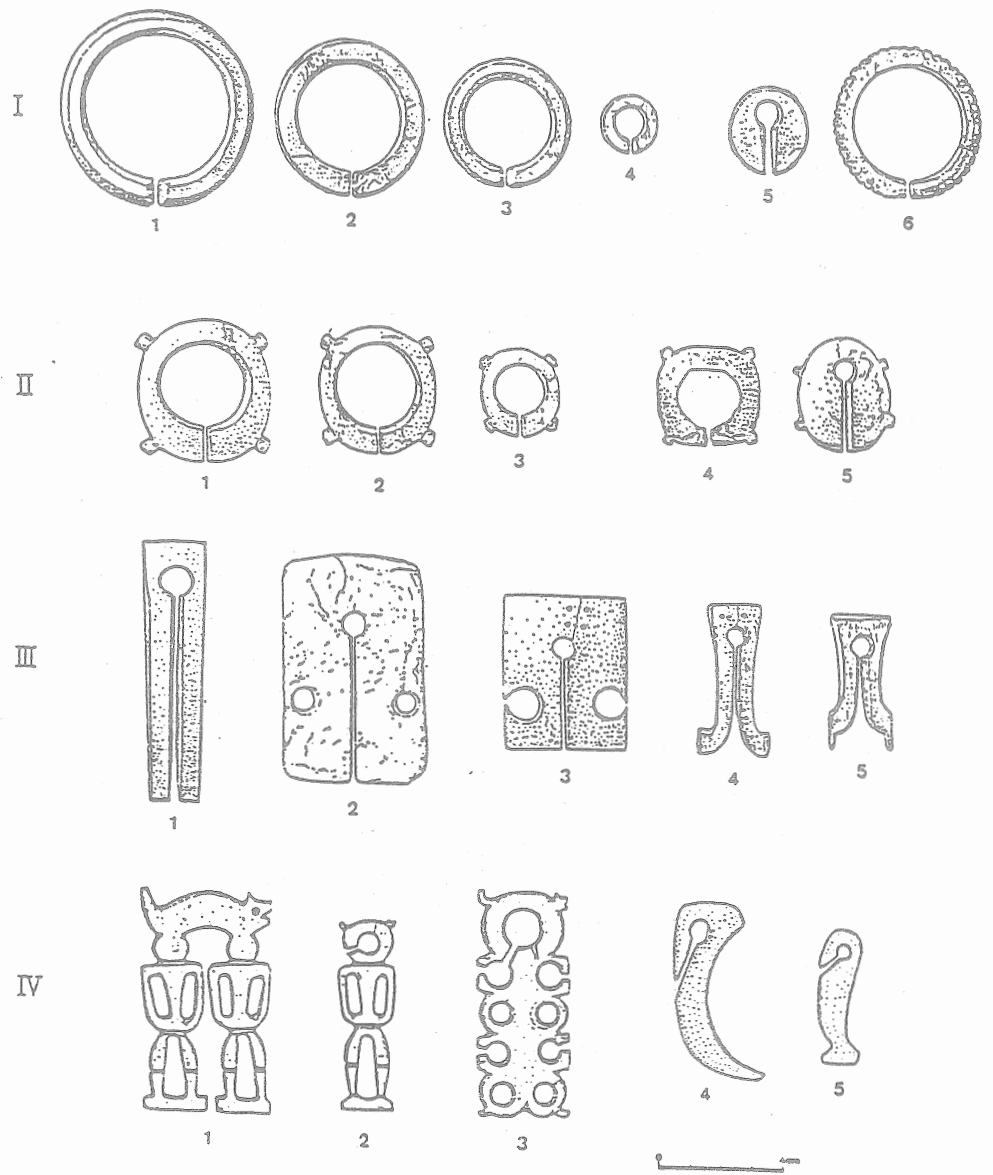


FIGURE 4: THE FOUR FORMS OF NEPHRITE (AND SLATE, II.4) SLOTTED EARRINGS FROM THE PEINAN EXCAVATIONS
Scale is 4 cm long

tubular boring techniques. Four forms have been preliminarily recognised from the total of 1032 slotted earrings from the Peinan burials (Fig. 4). Type I, the simple slotted ring (608 pieces from 262 graves) and Type II, the slotted ring with four protuberances (671 pieces from 184 graves) were the most common forms. Type I earrings vary in size and tend to occur in single burials. They might have been closely related to infants and the

female population. Type II earrings are of more regular size but a wider range of materials. All of the slotted rings made of slate, often found in mass burials, were of Type II. There was no evidence of an earring type with only three protuberances. Type III represents various forms of rectangular slotted earrings (43 pieces from 38 graves), and Type IV represents additional rare forms such as human and animal shapes as well as crescents (only six specimens from four graves).

I believe that a detailed study of the slotted earrings could supply valuable evidence for internal chronology and some aspects of the social organization of the Peinan Culture. Peinan is not the only site in Taiwan which has yielded these slotted earrings, but it did yield the first definite evidence to prove an earring function. They have also been found in Yuanshan and other sites of the Yuanshan Culture, of similar forms to those of Peinan except for a very thin simple slotted type of earring which has only been found in Yuanshan sites in northern Taiwan. This type of slotted ring was more like a bracelet on account of its large size.

Architecture

More than 50 architectural units were found in the upper stratum of the site, revealed by the foundations of houses as well as storage structures (Fig. 5). Houses had rectangular plans and were built directly on the ground surface, with sizes averaging 11.5 x 5.5 m (including the front yard). Doors could not be identified with certainty but they most likely faced east towards the delta of the Peinan River. Front yards and most house interiors were paved with slate slabs or split boulders. One of the most striking characteristics was that the houses were clustered side-by-side in a zone with a NNE-SSW orientation. The slab graves lay directly underneath the houses with the same orientation (Fig. 5 lower).

Round or oblong storage structures, with or without a subterranean basement, were also built alongside the houses with the same orientation. The other side of the storage zone was defined by a long boulder wall. Beyond this was a second zone of houses. The elongated burial zone beneath the house zone measured about 15m wide and the house and storage zones together measured 18 to 20 m wide. Burials were seldom found beneath the storage structures.

Thus, the layout of the Neolithic village at Peinan can be reconstructed as follows (Lien 1989). The village was located at the foot of the Peinan Hills on a terrace of the Peinan River. Within the village, houses were built side by side to form an alignment which followed the direction of the hill. Each house was adjacent to one or two storage structures outside which adjoined those of neighboring houses. Thus, the storage structures seem to reflect the idea of community rather than private property. Burials were located underneath the houses rather than in a separate village cemetery. There were several zones of these house and storehouse combinations, with family burials beneath, distributed across the site.

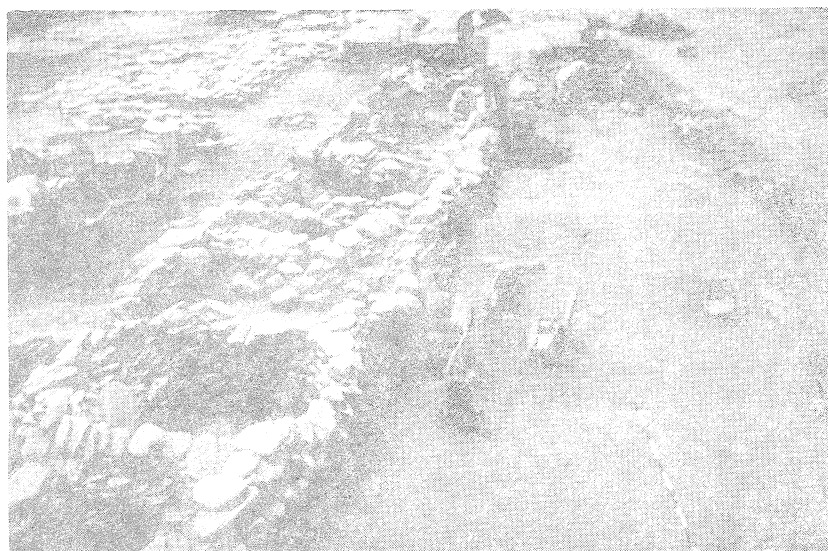


FIGURE 5: TOP, PEINAN EXCAVATIONS IN PROGRESS DURING THE 11TH SEASON, 1987
Boulder paved floors and boulder piled walls occur in the upper left corner, circular
storage structures in the centre, and at right smaller slab graves of the upper level.
BOTTOM, BOULDER PAVED FLOOR 20 TO 30 CM ABOVE THE SLATE SLAB COVER OF BURIAL PN

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DISCUSSION

The question of the identity of the makers of the corded pottery in the lower stratum of the site arises. Based on the characteristics of the cord impressions, the patterns of incision and the rim forms I suggest that the Peinan corded pottery definitely corresponds to that of the Tapengkeng Culture, the earliest known of the Neolithic cultures of northern and western Taiwan. Little is known of the Tapengkeng Culture in the Taitung area or of its relationship to the later Peinan Culture, but the association of the cord marked pottery with long points of slate (so-called slate needles, Lien and Sung 1989:54) may be evidence of some degree of local adaptation.

It is believed that during the interval from approximately 5,300 to 2,300 BP the people of the Peinan Culture maintained a sedentary village life. Cultivation was the principal mode of subsistence, supplemented by hunting on a rather intensive scale. There is some evidence that the site had been repeatedly occupied several times in a way which could suggest the practice of shifting cultivation, as among many modern groups of Taiwan aborigines. The Neolithic people of Peinan were very well acquainted with the use of slate and had mastered the way to procure slate slabs. Thus, slate was utilized to build their houses and graves and to make various kinds of tools.

Because particular types of jade ornaments can be used as horizon markers (Sung and Lien 1984; Sung 1989: Fig.1; Lien and Sung 1989:70-71), it is clear that the Peinan assemblage synchronizes with the Yuanshan Culture (Yuanshan and Chihshanyen) and the Niuchoutzu Culture (Kenting and Oluanpi; Lungshanoid in Chang's terminology). There were thus three parallel cultures in the three major regions of Neolithic Taiwan. As shown from the archaeological assemblages, the Peinan Culture not only shared with these other cultures similar technological and subsistence methods, such as the seed-based cultivation of rice and millet supplemented by hunting and fishing, but it also shared a number of specific customs of tooth extraction, betel nut chewing and head hunting. Nevertheless, the cultural distance between these groups was probably not much less in terms of pottery design and other features of style than that between the existing aboriginal groups as classified by ethnologists and linguistics (Sung 1980; Lien 1989b).

Although the Peinan site may not be one of the oldest sites of the Peinan Culture, the data analyzed clearly illustrate many aspects of its development and long duration. In addition to the increasing numbers and styles of artifacts, the most striking features in the site are the different forms of burials and graves. I still hold the idea that Peinan Culture expanded along the coastal area and higher foothills, eventually exploiting inland into the mountain areas. As a result the ethnographic Ami of the east coast and those people who entered the mountain zone maintained aspects of their original customs, such as tooth extraction, head hunting, flexed and squatting posture for burials in slate-lined graves under houses, and the common mass burials of the traditional Paiwan groups of the mountain zone.

Some scholars believe that there is a relationship between Peinan and the existing Ami, based on mutual geography and the shapes of pottery (Kanaseki and Kokubu 1957; Sung 1980). Others believe that Peinan Culture is closer to the existing Paiwan owing to

the high usage of slate in building houses and graves (Kano 1946). From the above-mentioned features and other archaeological information I agree very much with the correlation of the Peinan Culture with the ancestral Paiwan. This is contrary to the theory of a Lungshanoid-Paiwanic correlation, as suggested by Chang (1969:246) and Ferrell (1969).

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