

THE THAI-BRITISH ARCHAEOLOGICAL EXPEDITION\*  
A PRELIMINARY REPORT ON THE WORK  
OF THE FIRST SEASON 1965-1966

by

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The general aim of the expedition was to throw an archaeological light on the obscure period which preceded the foundation of the Empire of Dvaravati in the mid-6th century A.D. Having regard to the impressive amount of information on neolithic settlement in Central Thailand provided by the Thai-Danish Expedition's work at Ban Kao, it was thought most profitable in the present initial stage of archaeological research in this region to seek out sites which held promise of belonging to the period of the earliest metallurgy, subsequent to the neolithic represented by Ban Kao and preceding the earliest Buddhist remains and the date of the first historical notices. Since the question as to the priority of a pure bronze using economy over one acquainted with iron is not yet resolved (recent discovery in southern China suggests that the earliest use of the two metals does not conform to broad geographical or chronological distinctions in that region) the period which concerns us in Thailand may be provisionally termed the Early Metal Age. Our purpose in the first season's work was to devote about half of our time to a wide reconnaissance,

\* The participants in the expedition were, from the Fine Arts Department of Thailand, Mr. Vidya Indakosai, Mr. Nikom Suthiragsa, Mr. Virat Khuna-mas; Professor William Watson was in charge and included in his British party Dr. H. H.E. Loofs of the Australian National University, Mr. Gale Sieveking of the British Museum, Dr. M. Kerney of the Royal College of Science, London, Mrs. A. Sieveking, Mrs. K. Watson and Mr. R. Watson. The excavations reported here were carried out under the supervision of Professor Watson with the close assistance of Dr. Loofs at the first two sites; Professor Watson and Mr. Nikom Suthiragsa were in charge at the cave site. The first two sites were located in reconnaissance with Mr. Vidya Indakosai. Mr. Sieveking reported the cave site from his tour in north Thailand.

Any success that can be claimed for the expedition's operations in this critical and technically difficult first season is owed to the most friendly and helpful co-operation of the Director General and senior officers of the Fine Arts Department, and of the local archaeological officers in charge. To all of these we record our thanks. Among the last we make grateful mention of Mr. Seri Naenna and Mr. Khongdech Prapatthong.

planned to include reported but uninvestigated sites, and to conclude with extensive trial excavations at two or three of these. Reconnaissance was conducted in the vicinity of Chiengsaen, Uttaradit, Lopburi and Uthong, and a few places lying near the routes joining these towns. Upon consideration of reports received locally and from the archaeological branch of the Fine Arts Department, and an intensive study of surface indications at the sites, three places were chosen for trial, related in a rational plan as far as was possible at a preliminary stage. These were as follows:

- i. a field planted with Makhoe, now designated Tha Muang, at a point about 200 metres on the west side of the road leading from Uthong to Nakhon Pathom, 1.5 kms. from Uthong.
- ii. The vicinity of a group of charcoal kilns, now designated Kok Charoen ("Hill of Prosperity"), near the road from Chaibadan to Petchabun, 13.5 kms. from Chaibadan and 150 metres from the road to the west.
- iii. A cave known as Tham Nguang Chang (The Elephant's Trunk Cave), limestone cliff bordering the Chiangmai-Fang road on the west side, just short of km. 98 from Chiangmai.

It was intended to excavate chiefly on open sites, but the reconnaissance around Chiengsaen having yielded no clear indications of any such, the cave (iii) was chosen as a representative excavation in the northern area. Whereas excavation at the other two sites was partial and exploratory, the work on the comparatively small area of deposits at the cave was complete. Sites i and ii were deemed to be satisfactorily located inasmuch as they are spaced out and intermediate between the site of Ban Kao near Kanchanaburi and the site of Ban Nadi (Nam Pong 7) lying some 240 kms north of Khonkaen, where fruitful results have recently been obtained by excavations organized under the Archaeological Salvage Programme in North-Eastern Thailand. For the north we were perforce content with iii. In view of the discovery of bronze drums in the Uttaradit area, it was unfortunate that our search there did not yield surface indications which justified the mounting of excavations, for it is probable that settlement and metal production were comparatively advanced in this region in the Early Metal Age. Much the same may be said of our hopes and

disappointment (a) in the hill-enclosed rice growing area immediately east of the road between Chiengsaen and Maechan and (b) the low hills surrounding the lake at Phayao, both being areas which call for a closer investigation than we were able to give them, and for trial excavation at topographically promising points even when the surface indications are not quite positive.

The following preliminary account of the results of trial excavation is written before the analytical study of pottery, soil samples and human and animal remains has been completed, and conclusions adumbrated here must await the fuller report for confirmation.

### THA MUANG

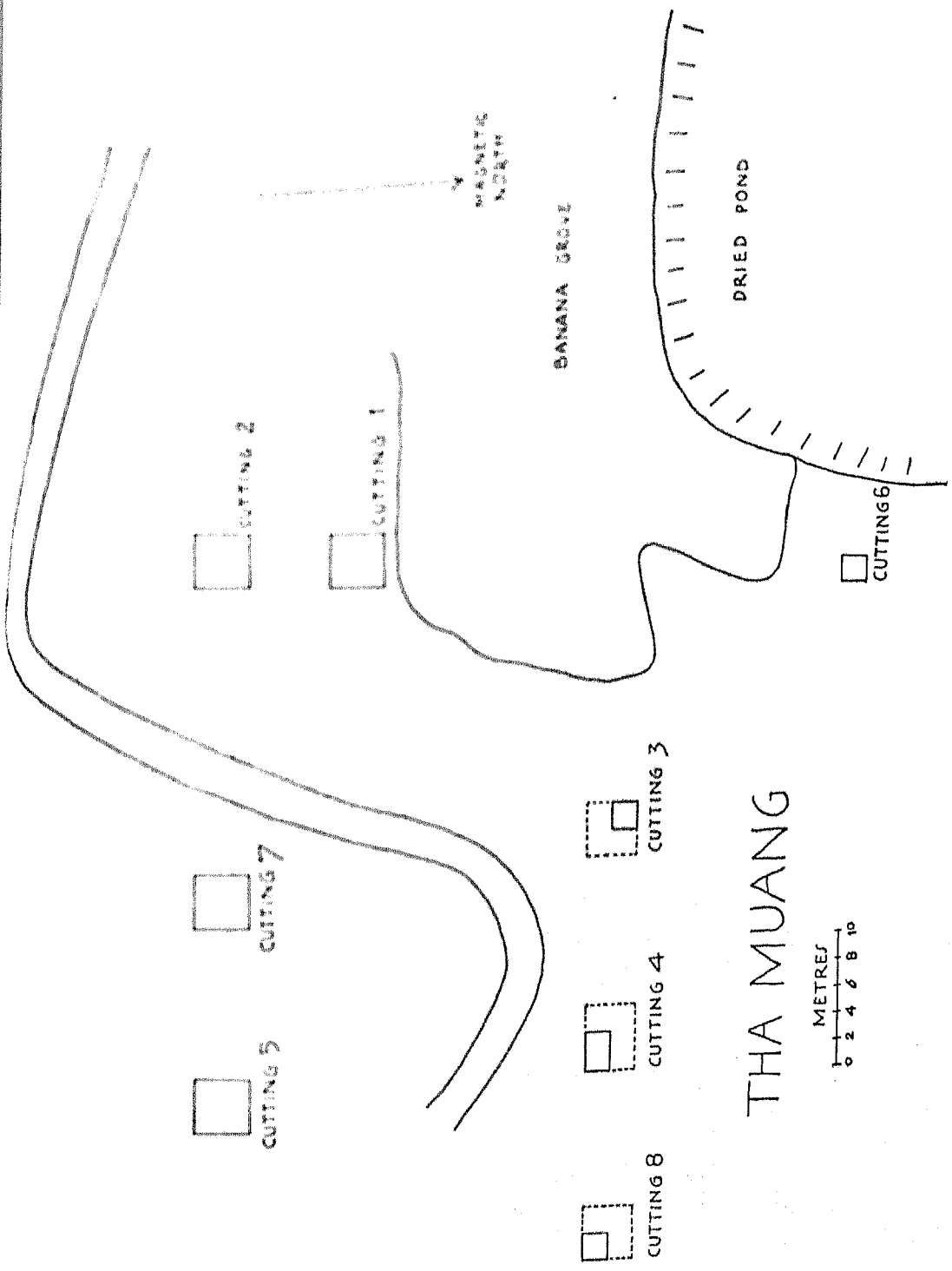
The field on which the site is located shows low undulations over stretches of 30-40 metres, the level varying no more than half a metre, such as point to long occupation, which is corroborated by a thick scatter of pottery fragments on the surface (figure 1). It was immediately noticeable that this pottery, while including much ware of primitive appearance, included no glazed fragments. Even on the surface small polished stone axes have been collected, and here and there fragments of honing stones and stone pestles can be picked up. The ground at this place is evidently raised a short distance above the general level of the extensive flat alluvium surround Uthong, which is mostly converted to rice cultivation. Low hills are visible from Tha Muang about 1.5 kms to the south-west. The site borders a deep pond which seasonally still holds water, the bottom of which when dry is used for growing vegetables. The part where the ground slopes down more gradually to the pond bottom is covered with a banana grove. The pond has every appearance of antiquity and of being an artificial feature, whether excavated to its present form, or remaining as a severed portion of old river bed, canal or moat. The last seems most likely and perhaps from a study of aerial photographs could be determined. On the surface of the site there is a sparse scatter of small shapeless lumps of burnt clay, but no fragments of formed bricks such as to suggest brick building and therefore Buddhist structures. It was later discovered that the scatter of burnt clay, this time including brick fragments, is thicker at a point some 100 metres to the south.

The cuttings (plan 1) were sited to cover a reasonably wide area along the edge of the pond. Cuttings 1 and 6 approached closest to it, but while the habitation material in 1 reached to the lowest level encountered anywhere on the site, the material recovered from 6 seemed to belong only to the later history of the site, corresponding approximately to the upper third of the other deep cuttings. Beyond cutting 6 the thinning out of the surface pottery confirmed that the edge of the settlement lay in this direction. The other cuttings cover an area of intense habitation of long duration. At all levels down to the clayey white gravel which forms the natural, pottery fragments were recovered in abundance. The stratigraphical complexity of the site cannot be resolved on the evidence of our comparatively widely spaced trial cuttings, but the observations made suffice to show that the history of deposition during the habitation on the site could be established in some detail by continued excavation in the area lying between the northern and southern rows of the present cuttings. The latter conform to a grid of 5 metre rectangles (cuttings 4 by 4 metres with baulks one metre wide) embracing the whole site. The traceable features include distinctions of soil colour, continuous and discontinuous levels of reddened earth and burnt clay, postholes, roundbottomed pits, ditches. Sufficient continuity of strata was observed between the various cuttings to suggest a tentative general statement as follows:

#### Topsoil

Level VIII	Grey-brown earth . . . . .	Phase 4
Level VII	The upper zone of burning . . .	Phase 3
Level VI	The upper brown earth . . .	
Level V	The middle zone of burning . . .	Phase 2
Level IV	Middle brown earth . . . . .	
Level III	Lower zone of burning . . . . .	Phase 1
Level II	Lower brown earth . . . . .	
Level I	Black earth	
base	White gravel	

The clearest distinction of the zones of burning was seen in cuttings 1, 2 and 4, involving the Levels III and V, where they appear



(Plan 1)

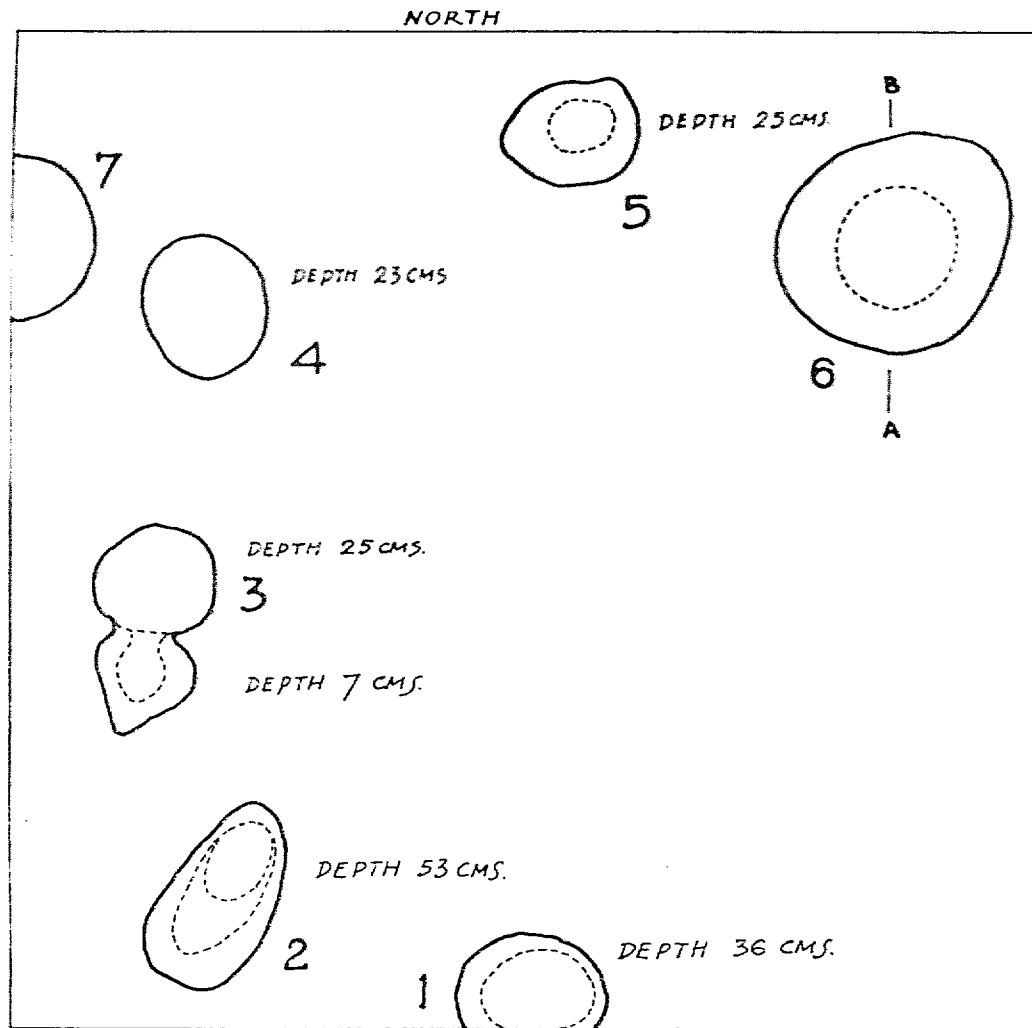
as bands of yellowish-red burnt clay, having a brick-like hardness in places, though containing no trace of formed brick. With these zones are associated more or less continuous bands of ash and earth containing a large proportion of charcoal. The two lower zones of burning, in the three cuttings where they are clearest, lie between 1.4 m. B.D. and 1.8 m. B.D. (though they appear to rise higher northwards from cutting 4). They are separated by a brown earth with a scatter of fine charcoal.

Elsewhere, as in Cuttings 5 and 8 the two zones are not separable, but represented by a 40-50 cm. wide band of yellow or reddened earth, in which the lower brown earth is not to be distinguished. Level I, the black earth, is in places of a lighter hue not unlike that of Level II but as seen in Cuttings 1,2,4,5 and 7, a comparatively sharp line separates it from the overlying lower brown earth. In four of these cuttings the upper surface of the black earth lay at approximately a little over 2 m. B.D., and potsherds, few in number, were found only in the top 10-20 cms of it. In Cutting 5, however, the surface lay at about 3 m. and potsherds were recovered from it down to 3.6 m. B.C. Here, unlike the similar sterile earth elsewhere, the black earth seemed to constitute the filling of an ancient pit. The form of such a pit, descending into the white gravel below 3 m. B.D. was clearly visible in Cutting 3. At all levels distinctions of soil colour and consistency were very difficult to establish, and in the case of Level I it was not possible to separate the pit-filling from the sterile black earth by observation, except where a pit showed up in section in the basal gravel. This problem will call for close attention in subsequent overall excavation. Chemical analysis may serve to distinguish the two deposits. It is suspected that the one may have been formed in swamp conditions or under water, whereas the other may preserve vegetable remains which may indicate the purpose for which this pit was dug.

A similar problem of origin is presented by the occurrence of bands of the whitish clayey gravel, resembling the basal gravel, at high levels between strata of habitation deposit. They were observed only in Cutting 4. While the basal gravel has all the appearance of a deposit formed in still water, it is difficult to ascribe a like origin to

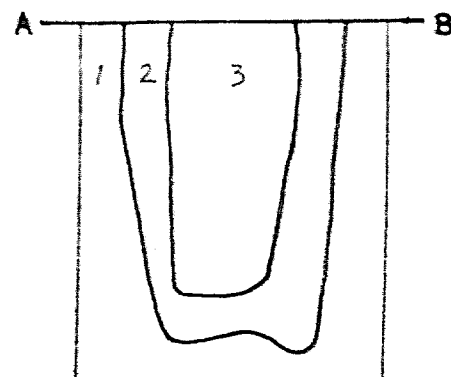
the white gravel found at higher levels. The theory of a general flooding of the area which might account for it is not consistent with the absence of upper white gravels in other cuttings where the remaining strata show reasonable conformity with those of Cutting 4, or with the presumed antiquity of the neighbouring pond. Nor is it likely that the localised patches of white gravel should have been laid in the bed of a stream flowing into the pond. It remains possible that the gravel visible in regular bands just below and above 2 m B.D. in Cutting 4 (and on the north face also at 60 cm B.D.) was deliberately laid by the inhabitants of the place, or at least resulted in some way from their activities (figure 2).

The higher and drier parts of the soil exposed in the cuttings is fine-grained, limy and in places concreted to considerable hardness. Where it locally becomes looser the change is usually the result of a higher proportion of charcoal or ash included in it. Any reliable conclusion on the meaning of the variation of soils from bottom to top of the cuttings will depend on the results of chemical and (if this, as we hope, proves possible) botanical analysis. In the meantime it is legitimate to point to the lighter, grey-brown or quite grey colour of the half metre or so of soil lying immediately below the topsoil as distinguishing it from all the deeper soils, which are browner or black, and loamier or (towards the bottom) almost silt-like. It is uncertain whether the distinction between these two soils is the result of a change in the intensity of habitation, or a chemical effect. The possibility of erosion of the surface (which would tend to concentrate potsherds there) makes it unsafe also to infer that the shallow depth of the upper light soil represents a proportionally shorter period of time than that corresponding to the occupation soil beneath. The traces of holes for massive posts found in Cuttings 1 and 5 suggest that, on part of the site at least, houses were of wood and raised above the ground on pillars. In Cutting 1 (figure 3; plan 2) the posts were raised on a ground level of about 1.3 m. B.D., in Cutting 5 at about 1.65 m B.D. At both places there were instances of postholes filled with the same yellow-red earth with burnt clay rubble as constitutes the zone of burning, this in the case of Cutting 1 being the lower zone, Level III. The stratum of burnt earth curved gently



CENTIMETRES

0 10 20 30 40 50



- 1 BLACK EARTH
- 2 RUBBLE OF BURNT CLAY & CHARCOAL
- 3 D.T.O., BUT DARKER

THA MUANG  
POSTHOLES IN  
NORTHWEST QUARTER  
OF CUTTING 1, AT  
1.6 METRES B.D.

NO 7 APPEARS IN WEST SECTION, RUBBLE FILLING CURVING INTO MIDDLE BURNT ZONE AT 130 CMS B.D.

over the edges of the posthole to form its fillings, in which a few potsherds were found. No certain explanation of this observation has been reached. The comparatively widespread area of contemporary burning attested by the zones of reddened earth argues more, it is thought, than local fire used for industrial purposes, whether smelting ore or firing pottery. It argues rather in each instance a conflagration which engulfed the whole of the settlement or part of a settlement embraced in the trial cuttings. There is, in other words, evidence for at least three periods of destruction in the history of the site.

With the exception of one small nondescript vessel found in an upper level, no intact pots were discovered in the excavations at Uthong. The abundant potsherds, classified by cutting and level to 10 cms, still await study, and before this is completed there is little that can be said of general import. It was clear at once that the ceramic tradition from the deepest levels onwards is one of unbroken development. Certain types persist throughout the history of the site, or to alter little, and at no point were the excavators made aware of a sudden intrusion of alien ware or vessel shapes. On the other hand, even on a cursory examination there were strong suggestions of disturbance in some of the cuttings. For example, in Cutting 3 where a deep pit reached from an uncertain level towards the middle of the sequence down and into the natural, potsherds extracted below 2 m. B.D. contained both examples of an appropriately early type and others which were elsewhere recognized as characteristic of Level VI and above. The following generalizing remarks are tentative: they indicate the lines which analysis may follow in the quest of dating criteria.

1. A shallow bowl with round base, a sharp carination on the side and above this a short, plain and usually slightly concave shoulder, was made at the period corresponding to the upper part of Level I and Level II. This shape has obvious affinities with a characteristic neolithic type excavated at Ban Kao. It persisted in Central Thailand throughout the Early Metal Age, as our excavations at Kok Charoen show, and developed through the Tha Muang period to become the 'carinated bowl with ribbed shoulder' which

is exceedingly common in Levels VI to VIII. The earliest, simple representatives of the type are made of poor, thin fabric, black in the fracture from an excessive vegetable content in the clay. The latest examples are of comparatively pure clay burned beyond normal earthenware hardness, and were made on the potter's wheel. An estimate of the point at which the wheel was adopted must await a full analysis of the material.

2. Some of the earliest pottery on the site is plain-surfaced, like the shallow carinated bowls. Eventually the majority of pots of all types are decorated with cord-impressions, or cross-hatching of incised lines, in both of these treatments there being a fairly clear distinction between a finer and a coarser execution. The custom was to apply this decoration only below the shoulder of the vessel in the case of the carinated shapes.
3. There is to be found at every level a considerable range of carefully shaped rims. In the lower reaches of the cuttings the rims are profiled in nail-head and rolledover shapes, or as cavetto rims with a finely beaded edge. The variety of these increases in the middle zone, and towards the upper part of the cuttings, in Levels VI and above, the rims can be quite elaborate, with grooves, or convex and concave mouldings added to the basic traditional forms of finish.

The features described above are variations applied to a conservative local tradition which is eloquent proof of cultural and ethnic continuity. The following features, while still not amounting to evidence of intrusive change, mark innovations which may prove useful as chronological markers, and, since they display greater individuality, may serve to link significantly similar characteristics in neighbouring regions.

4. A small number of sherds with geometric figures sketchily incised with a sharp point occurred in layers corresponding approximately to Level II. The survival of this ware in later levels is not yet investigated, but it appears to be absent from Levels VI-VIII, and it is thought that it may have ceased earlier.

5. The custom of dimpling the heavy shoulder cordons of vessels in plicrust fashion can be traced as early as Level VI and persists thereafter.
6. A comparatively small number of sherds display a dark red slipped surface on which broad curvilinear figures are grooved with a blunt tool. Examples were recovered from Levels IV and VI. This is a ware of distinctive refinement, thinner walled than the average.

It is still too early in our study of the excavated material for conclusions regarding stratigraphical incidence of other finds which hold promise for dating and regional affinity. The chief of these are pygmy clay vessels, perhaps properly designated 'offering cups'; perforated clay discs, plain or with simple impressed decoration, which are netweights or in some cases possible spindle-whorls; certain oblong objects of clay, five to ten centimetres long and decorated with crossing incised lines, the purpose of which is obscure; small polished stone axes. Coloured glass beads, spherical clay pellets and rondels formed from potsherds were ubiquitous in the strata. The last may be intended for a game, and the clay balls witness to the ancient use of the same pellet-bow as may still be seen in the hands of country boys in Thailand today. All these types of objects existed from the earliest phase of the site, and any contribution to the history of the site which they can make must depend on minor variation of form and decoration such as may be established by careful analysis. The small spherical beads of blue, red yellow and green glass are seldom more than 3 mm in diameter, and on a superficial examination reveal no significant change in colour or material from top to bottom of the strata. Metal in the form of iron knife blades and small rings of lead was from level VI.

### Dating.

The finding of polished stone axes at the site, both on the surface and at depth, is in itself little guarantee of antiquity, as the manufacture of these tools continued long after the introduction of metallurgy and other civilized techniques into this region. On the

contrary, a large part of the later occupation at the site must fall into the Buddhist period. Buddhist sculptural remains found at Uthong have been referred to the Period of the Mon Kingdom of Dvaravati, and may therefore go back as early as the 5th century A.D. It is noteworthy that some small clay objects found at Tha Muang have analogies in material attributed to the Dvaravati period. What the study of the pottery can contribute to this question remains to be seen, but it seems very probable even from the cursory inspection which has so far been made that the occupation at Tha Muang begins well before the foundation of the Mon kingdom. This appears in the resemblance of the round-based, carinated bowls characteristic of the first phase of the site to bowls found both at Ban Kao in a neolithic context and at Kok Charoen (see below) in a context more probably belonging to the Early Metal Age. This was a long-lived pot form, but its appearance at low levels at Tha Muang still suggests an early date, possibly in the first millennium B.C.—no more precise conclusion can be drawn. As to the lower date of the occupation at Tha Muang, we depend as yet on two inconclusive arguments. One is the fact of the recorded abandonment of Uthong city after the foundation of the kingdom of Ayudhya by the Prince Rama T'ibodi I of Uthong in A.D. 1350; the other argument, and a stronger one, is the virtual total absence from the site of fragments of glazed pottery. In the vicinity of other important Buddhist foundations dating after the introduction of glazed pottery of the Sukhotai and Sawankhalok varieties in the early 13th century, glazed potsherds are common. These indeed are found at some places within the perimeter of Uthong near the remains of buildings, but at Tha Muang fragments were not found, except a few in the upper disturbed part of Cutting 7.

#### KOK CHAROEN

Apart from finds of polished stone axes and abundant potsherds at the place, the attraction for excavation of the site at Kok Charoen lay in its position on a kind of low promontory bounded by a brief but steep slope which for most of its extent is doubled by a stream. Towards the north this stream still has fairly deep water all the year round. On the east side the stream bed fills in the wet season. It is

a branch or continuation of the permanent stream and no doubt under little altered circumstances of climate or local drainage would also retain water during the dry season. These features of ground and water suggested a village site, having its analogies in many neolithic sites of central and south China. The relief of the promontory, with its slightly convex surface and edges of a steepness which recent agriculture seems not to account for, also indicated early occupation. Some 200 metres to the southwest of the promontory site are two other areas of slightly swelling ground, covered also with pottery, which are no less suggestive of ancient habitation. It was decided however to start with excavation on the promontory for here a find of human bones was reported, discovered during work at the charcoal pit situated south of the hut. The cuttings were disposed to straddle the site, and the expectation of uncovering burials was soon verified (figure 4, plan 3).

The site of Kok Charoen is situated on the edge of a series of low hills which are the outliers of the north-south line of hills separating the drainage basin of the Mekhong and the Chao Phraya rivers, in a region of topography favouring village settlement. The soil is not so markedly lateritic as in the plains to west and east, and on the site is remarkably shallow. Three levels were distinguishable in the sections of the cuttings:

1. Topsoil
2. Stony brown earth
3. Basal limy earth.

With a datum line fixed a few centimetres below the present surface, the stony brown earth extended approximately from 20 to 40 centimetres below datum. The basal earth consists of a much concreted humus free deposit of whitish earth and small little-rolled stones, the whole resembling hill-wash typically formed in a calcareous region. No cultural remains whatever were found embedded in the basal earth. Human bones, pots and potsherds found below the level of the stony brown soil had been placed in shallow graves or in pits dug into the limy earth. The stony brown earth is the habitation soil of the ancient occupation.



The abundant pottery found in the excavations comprised vessels virtually intact placed in the burials, vessels shattered (deliberately in antiquity or by subsequent disturbance) also with the burials, and potsherds thickly scattered through the ancient and the modern soils. Some complete but broken vessels and some large broken urns containing smaller broken pots were also found, apparently buried independently of any graves. All the pottery reflects a fairly uniform method of firing, all of it being comparatively soft, arguing open firing, or at least firing without induced draught. The clay is poorly levigated and tempered apparently with vegetable fibre (though this point awaits confirmation in the laboratory). The commonest surface colour is a reddish buff, which generally appears on both the outer and inner surface. Normally, seen in the break, the reddish part forms a thin skin of uniform thickness over an inner grey-black fabric, the line of demarcation being fairly sharp. Were it not for the evidence seen on a few pots of a carefully applied powdery slip of a distinctive fiery red, the common red-buff surface might be thought also to result from slipping with finer clay; but this last seems improbable.

The following different methods of preparing the pot body are detectable:

1. The use of pad and beater: the pad dimplings visible on the inner surface measuring 3 or 4 cms across, and the close, parallel and comparatively fine lines of cord impressions resulting from twisted string wound up to nine or ten times around the spatula which served as a beater. The patches of cording naturally correspond approximately to the size of the pad, the change of position of the pad on the inner surface coinciding with more or less sharp changes in the direction of the groups of parallel corded lines on the outer surface. In this process the cords are thin—about 2 mm in diameter, and the impressions they make are not much blurred by subsequent handling of the decorated surface.
2. The use of pad and beater, but with a larger pad and a beater with fewer, possibly three or four, lines of coarser, thicker string wound on it. In this case the cord marks bite deep into the clay and the ridges formed between them have inevitably been somewhat

flattened as the unburnt pot was handled, with the result that the corded pattern appears a little blurred. On the fragments of pottery treated in this manner the traces of the pad on the inner surface is barely detectable, this surface having been burnished smooth. There are fragments with corded decoration of a scale intermediate between the two here described, but on the whole the distinction between 'fine cording' and 'coarse cording' is quite clear.

3. On some bowls with corded sides and in-turned rims the upper surface of these rims is burnished, and the whole inner and outer surfaces of some plain (i.e. not corded) pots are burnished in quite the same manner. The smoothing appears to have been executed with a narrow rounded point.
4. While the methods described above are those applied to hand-made pottery, it is possible that some turning device (but never a rapid potter's wheel) was used to produce the foot rim of the pedestal bowls (see below). Their exactly circular shape can hardly have been achieved without it. But even in the case of these pots the bowls (burnished as described in 3 above) are clearly hand made, preserving irregularities of surface and thickness which suggest that they also were prepared by some pad and beater method (though normally this method is appropriate when the outer surface receives the impressions of cords or stamps).
5. Some rarer, distinguished vessels have a smooth surface treated with a dark red slip to which decoration has been added by grooving curvilinear figures with a narrow rounded point, and by filling some areas with pecked marks.

The types of pottery vessels found at Kok Charoen comprise the following:

1. Round-based sub-spherical vessels with fine or coarse cording according to their size, and a flat rim rising at about 60° from the horizontal. The size varies from a diameter of about 18 cms to at least twice this figure. The cording normally begins just above the widest part of the vessel and continues unbroken around the base. In some vessels which appear to belong to this class the inner surface of the wide rim is set off with a fiery red slip.

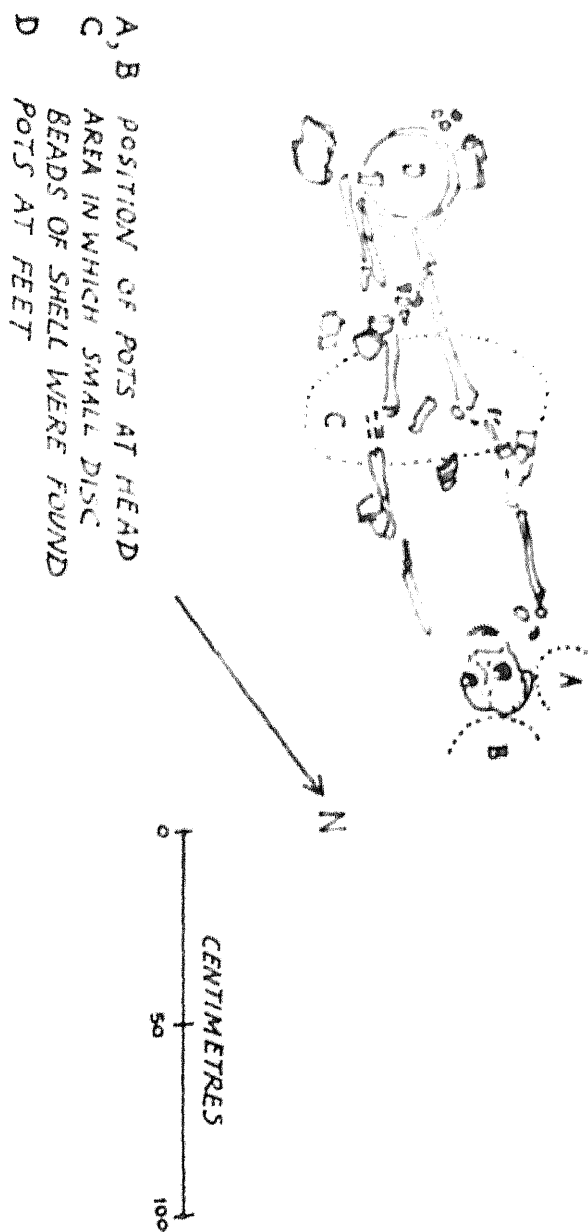
2. Shallow round-based bowls with inturned lip. The latter is burnished, and the sides below the shoulder are coarsecardes.
3. Pedestal bowl with steep sides and a comparatively high, hollow foot inclined at about 60° to the horizontal. Three quarters of the vessel side follows a regular curve, and the last quarter rises vertically to the lip. These bowls are burnished in the manner described above. Some examples are fired to a light reddish brown; others have on the outer face a rich red slip, which has been lost from much of the upper part of the bowl.
4. Represented by one example with a diameter of 29 cms at the mouth: a carinated bowl with pedestal. The existence of the latter is vouched for by the form of the break in the base of what remains of the vessel, the gap being roughly circular and showing in places the beginning of the outward turn of the vessel side. This piece is burnished inside and out, and burned to a mottled red-brown on the outside, while the inside is black all over.

The burials at Kok Charoen were not prepared with particular care and the grave goods were of the simplest. The orientation of the body was not uniform, thus:

Cutting 1	skeleton 2	head slightly west of north
Cutting 2	skeleton 1	head to south west
Cutting 3	skeletons 3,4,5	head to north east

The bodies were placed on the back, with the arms at the sides, with pots placed as follows:

- skeleton 1 two pots above head; none traced at feet, but these possibly, though improbably, beyond the limit of the cutting.
- skeleton 2 fragments of a large pot at the feet; no pots at the head.
- skeleton 3 two intact and other broken pots at the head; one intact and at least two broken pots at the feet (figure 5).
- skeleton 4 broken pots at the feet; the upper part of the skeleton remained unexcavated in the north east wall of the cutting.
- skeleton 5 two intact pots at the head; one intact and several broken pots at the feet. Lines of potsherds were laid against and over the limbs, and elsewhere some potsherds had been set on edge. Small disc beads of shell were bound near the waist (figure 6; plan 4).



KOK CHAROEN SKELETON NO 5 IN  
CUTTING 3 AT 2AB

(Plan 4)

In nearly every one of these burials there was reason to suspect that some of the pots had been deliberately broken when the funeral took place. In the case of pots which survive complete but in fragmentary condition, the disposition of the fragments (particularly when they were strung out approximately in a line) did not suggest breaking either by natural soil movement, the interference of tree roots or recent agricultural operations. Apart from groups of fragments representing complete or tolerably complete pots, seemingly broken in the course of the funeral rite, there were other groups of potsherds disposed about the corpse which, one surmises, were deliberately placed as fragments near the limbs of the corpse. Some of these potsherds were found raised on edge.

Some small polished stone axes were found in the *couche archéologique*, but none associated with a burial. As grave gifts additional to the pottery only a scatter of small disc beads of shell were found at one place, near the waist of skeleton 5. No metal or trace of smelting was observed. Some small flakes of obsidian found sporadically in the cuttings could not be matched with any finished products in the material, so that it remains uncertain whether the obsidian was used for adornment or for tipping arrows. More probably ornaments were made of it. There is no near source for the material, so that its presence indicates import from at least as far as Sumatra or Java.<sup>1</sup>

Where tree roots had penetrated into the limy earth, some more humic soil had followed, with the consequence that the outlines of graves and pits dug into the basal soil were difficult to distinguish. The clearest instance of a pit was that encountered on the northeast side of Cutting I. The outline appeared as a rough semi-circle projecting some 80 cms from the wall of the cutting. Towards the southwest edge, against the wall, was a fragment of human skull partly underlying a heavy stone which seemed to have crushed it. As far as could be ascertained without extending the cutting further than was deemed possible, this skull fragment appeared not to connect with other parts of a skeleton. The fragment lay at 50-60 cms below datum,

1) It was later confirmed that the source is in fact the tektites of obsidian which are found in the region.

and about one metre to the northwest, at the same level, was a broken urn with flaring mouth of the typical funeral sort. But below this pot, still in the dark filling of the pit, was a more remarkable object: an elongated pot with straight parallel side, unlike any other found on the site. It was placed exactly vertically, and apparently deliberately so, extending from 100 to 65 cms below datum. Its decoration consists of meandering incised ribbons filled with pecking.

### Dating

On our present knowledge the date of the remains at Kok Charoen can be estimated only within very broad limits. The pottery, as far as comparison is possible, suggests that it dates earlier than any at Tha Muang, or at least earlier than any but the very earliest at that site. On the other hand there are points of comparison in both the simpler and the more sophisticated vessels (for the latter *cf.* the flaring-mouth urns and the tall pot from the pit in Cutting 1) with pottery excavated from low levels at Ban Nadi in east Thailand. It becomes increasingly evident that the levels containing this pottery belong to a comparatively early part of the Early Metal Age, and the possibility of a date in the second millennium B.C. cannot be excluded. Some such dating, therefore, is admissible provisionally for the occupation at Kok Charoen to which the burials belong. But until the range of comparison is greatly broadened and the results of carbon dating are available more positive conclusions are hazardous.

### THAM NGUANG CHIANG

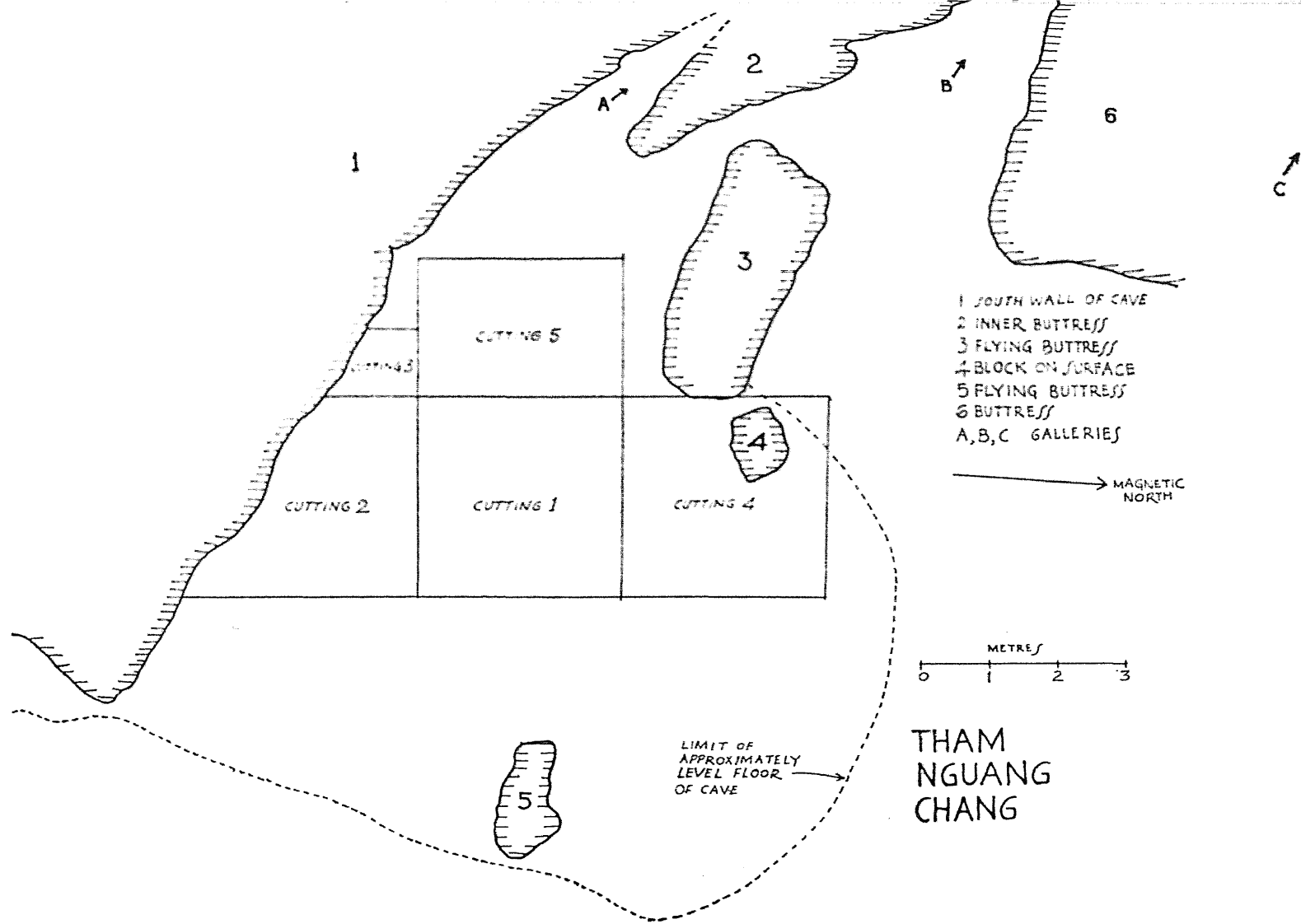
At this cave the filling of the entrance falls away rapidly at the mouth, and the area offering itself for excavation was in consequence restricted (figure 7). The deposit proved to have no great depth and was much encumbered with buried rocks fallen from the roof. Facing east towards a stretch of country free of hills for some distance, the cave is admirably suited for habitation. In fact it proved to contain relics of burials of the Early Metal Age and of a stone-age industry.

The excavation took in almost the whole of the part of the cave floor which remains approximately level, the area from which the floor falls away both from the mouth and inwards towards the

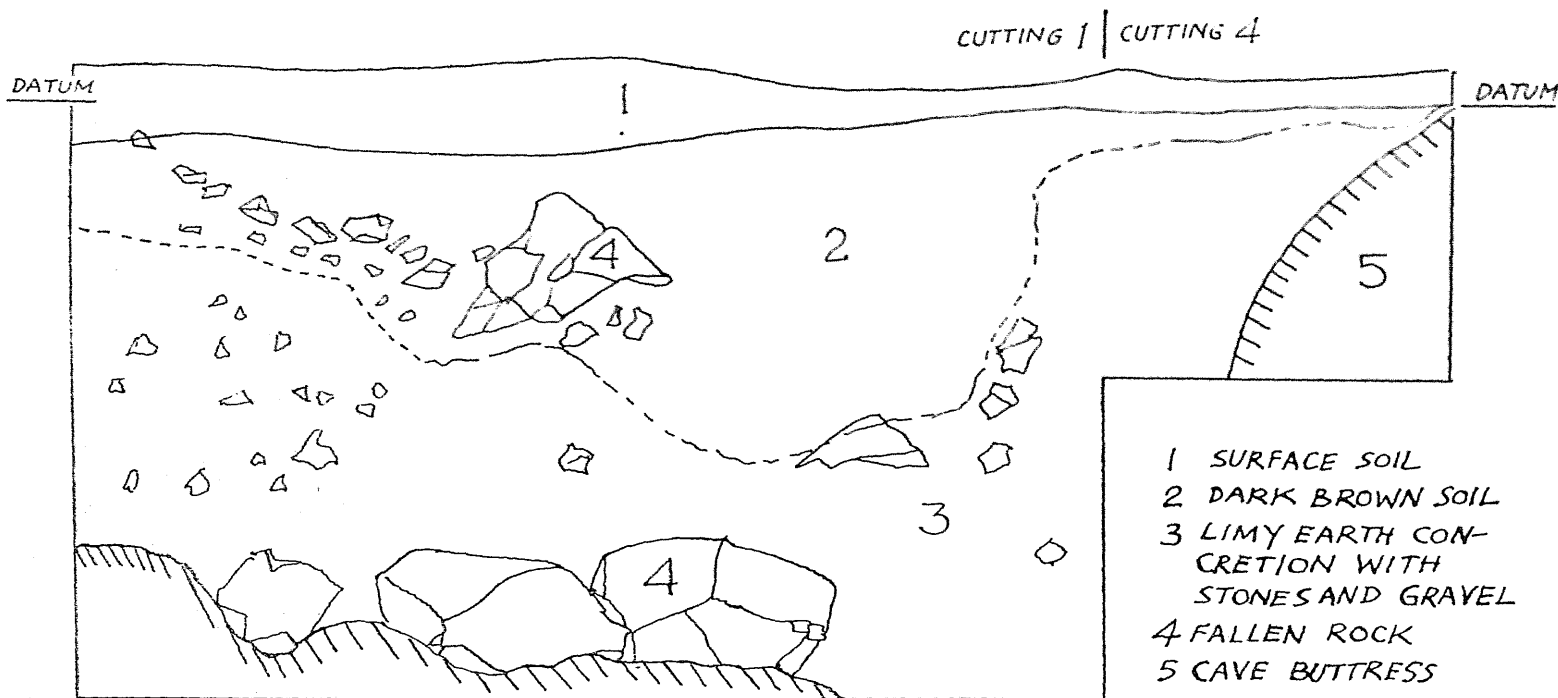
several galleries leading to the interior (plan 5). Deep inside the cave there was no surface indication of habitation, and continued occupation at any period is unlikely. The lower part of the cave filling consists of a limy earth concreted with gravel and stones. Above this deposit, and filling the hollows made by the burials, was a layer of dark brown soil varying in depth from a few centimetres to about a metre (plans 6 & 7a).

Skeleton 1 was found near the south wall of the cave, laid on the back at 20-40 cms below datum (which itself was fixed a few centimetres below the present surface). While the skull and long bones lay approximately in position, the skeleton showed signs of disturbance. The epiphyses of the bones were mostly removed and the interior bones suggested interference by animals. The smaller and thinner bones were too rotten to allow recovery. The region near and above the head contained a scatter of objects presumed to be associated with the burial, but more or less disturbed from their original positions. A few potsherds were found here, but insufficient to constitute a complete pot. Two boar's tusks lay close together 50 cms beyond the head, near potsherds and fragments of animal bone. Two small cylindrical beads, possibly of agate, lay just below the chin. A careful sifting failed to recover more beads, and one must assume that the ornament was very modest. A large stone near and above the head appeared to have been deliberately placed. Skeleton 2 (plan 7b) lying in cuttings 2 and 3, presented a much shorter and lighter-boned person. While not quite underlying skeleton 1, this burial was near enough to it to suggest that it must be the earlier, as otherwise it could scarcely have escaped disturbance when the other burial was made. This circumstance suggests that the cave was at any rate not an habitation at the time of these burials. Skeleton 2 lay slightly inclined towards the feet. The bones were even more petrified than those of skeleton 1.

The only grave-goods with this burial were important ones. Against the upper part of the right arm lay two iron axes of long, slender form, without trace of hafting or other addenda (figure 8; plan 7c). A bronze socketed axe was found only 10 cms below the



(Plan 5)



THAM  
NGUANG  
CHANG

SECTION WEST,  
CUTTINGS 1 & 4

(Plan 6)



modern surface, at a point beyond the feet of the skeleton, about 2 metres east of the position of the left hand. It is conceivable that this tool was originally part of the burial represented by skeleton 1, and was flung away from it by animal or human marauders. Since it is likely that the cave was used only for burials in the Early Metal Age, it seems probable that the bronze was deposited for some ritual purpose. Here and there in the brown soil, particularly in Cuttings 1 and 5, crushed pottery vessels were found, capable of complete restoration (figure 9 a & b). Against the north face of Cutting 1 a few hand bones of a human skeleton were recovered, and near them two crushed pots and an armlet of greenstone, but on extending the area of excavation no further trace of this skeleton was observed.

The pottery found in the dark brown soil and which may be more or less associated with the burials, is summarized as follows:

1. Small bag-shaped pots with a curving restriction at the neck and conical lids furnished with a handle in the form of a knob or a double spike. The surface is light brown and burnished, the fabric poorly fired. A number of the isolated groups of potsherds conformed to this type, but these pots did not occur in the immediate vicinity of the fully excavated skeletons 1 and 2.
2. Similar simple vessels, in one case a hemispherical bowl, made with thin walls decorated with cord impressions.
3. A thin-walled pottery decorated with crosshatched lines.
4. Pottery decorated with deliberate motifs executed by incisions or grooves. This was represented by isolated fragments bearing decoration (a) of strapwork of incised ribbons enclosing lines of impressed circles, as if in imitation of rivetted metal vessels (b) of zigzag designs filled with cross-hatched lines (c) of straight grooved lines set against zigzagging lines (d) of grooved curvilinear and undulating lines (not necessarily distinct from class c).

It remains to speak of the remains of a Hoabhinian type stone industry which were excavated from the cave. The chief finds were three well formed choppers formed on pebbles (one face fashioned and the other left with the pebble surface), and two mace heads made of flattish pebbles, one complete and one broken in half. Two choppers were recovered from Cutting 2, where they lay in the limy basal filling of the cave. One of them nested in a fragment of limy con-

cretion in a manner to make plain that it had been discarded in the cave at a time before the brown soil had come to cover the basal deposit. This circumstance is eloquent of the much greater antiquity of the stone tools over the burials of the Early Metal Age, supposing such an argument were needed. The tools lay at 80 and 90 cms below datum. Another, from Cutting 4, where the cave floor of rock or impenetrable concretion in places rises almost to the surface, lay at 65 cms below datum, on the surface of the basal deposit. The mace-heads on the other hand were in the centre of Cutting 4 at 40-50 cms below datum, and therefore near the junction of the basal deposit and the brown soil. The perforations of the mace-heads are pecked from either side to give an hour-glass section in the normal primitive manner. Although the pebble is asymmetrical, the mace head is nicely balanced about the perforation.

### Dating

The attribution of the burials at Tham Nguang Chang to the Early Metal Age and to a metal-using community is established by the find of bronzes with skeleton 2. An unidentifiable iron tool found at depth may also belong to the period of the burials. The incised and grooved potsherds rather loosely associated with the burials have only broad analogies with the pottery from Kok Charoen, and the small lidded urns from Tham Nguang Chang appear to be *sui generis*. The appearance of iron proves the age of these burials considerably later than those of Kok Charoen. There is however no reason to believe that a long period separates the iron tools from the bronze socketed axe. Both may belong to a possibly prolonged stage of metallurgy in which iron and bronze were in use simultaneously. Judged by itself the bronze axe need not imply a date earlier than the middle of the first millennium B.C. Its appearance in context with iron (supposing, as seems likely, that the burials containing each were roughly contemporary) would argue at the latest a date two or three centuries later.

The significance of the Hoabhinian-type industry and the mace-heads must await a larger accumulation of knowledge regarding the northward and westward spread of the Hoabhinian complex in general. The pebble tools find parallels in southwest China as well as in the acknowledged Hoabhinian sphere farther south. The affinities of the mace-heads are less certain.



Figure 1  
Tha Muang  
General view of the site

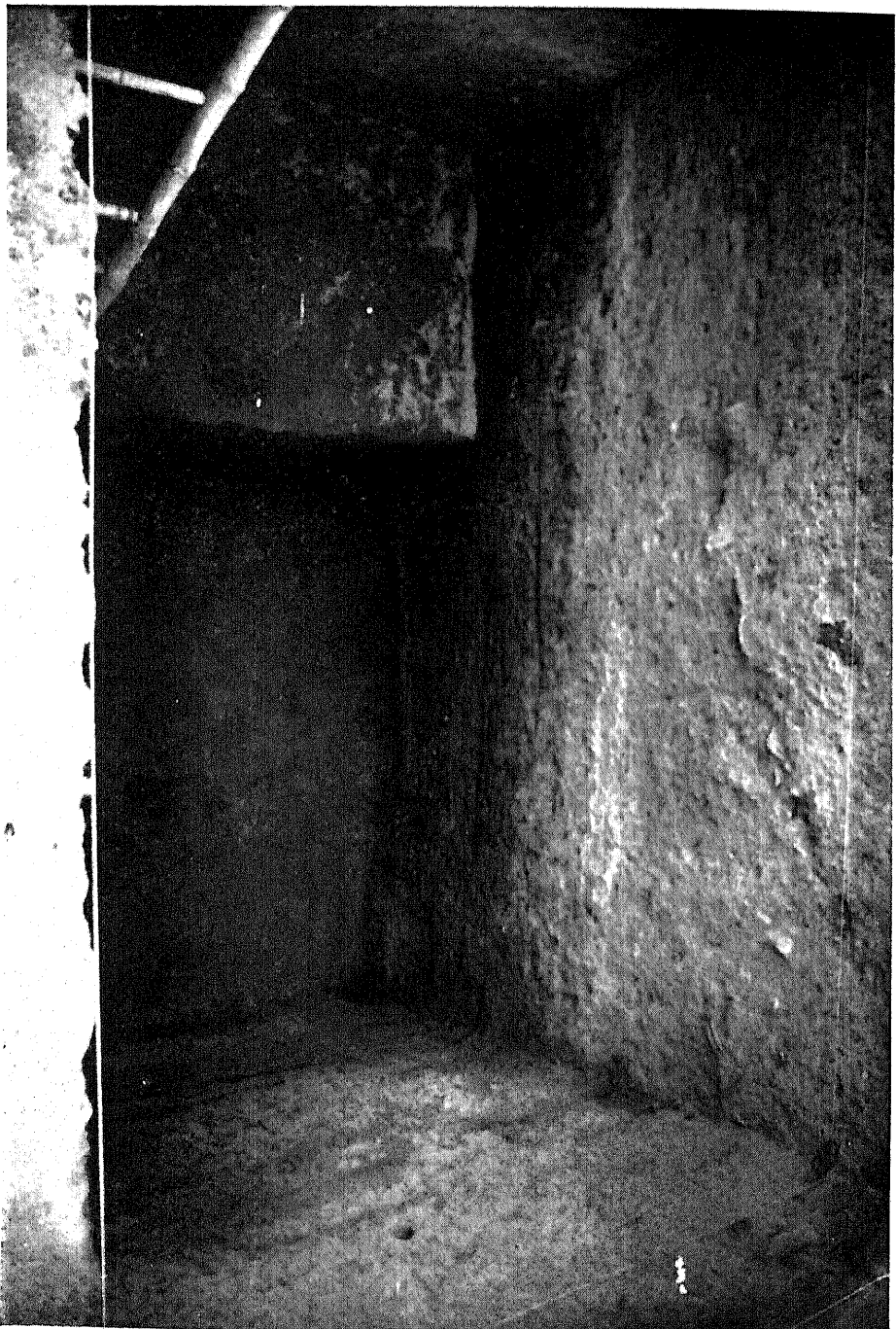


Figure 2  
Tha Muang  
Cutting 4, section on north side



Figure 3  
Tha Muang  
Post-holes in Cutting 1

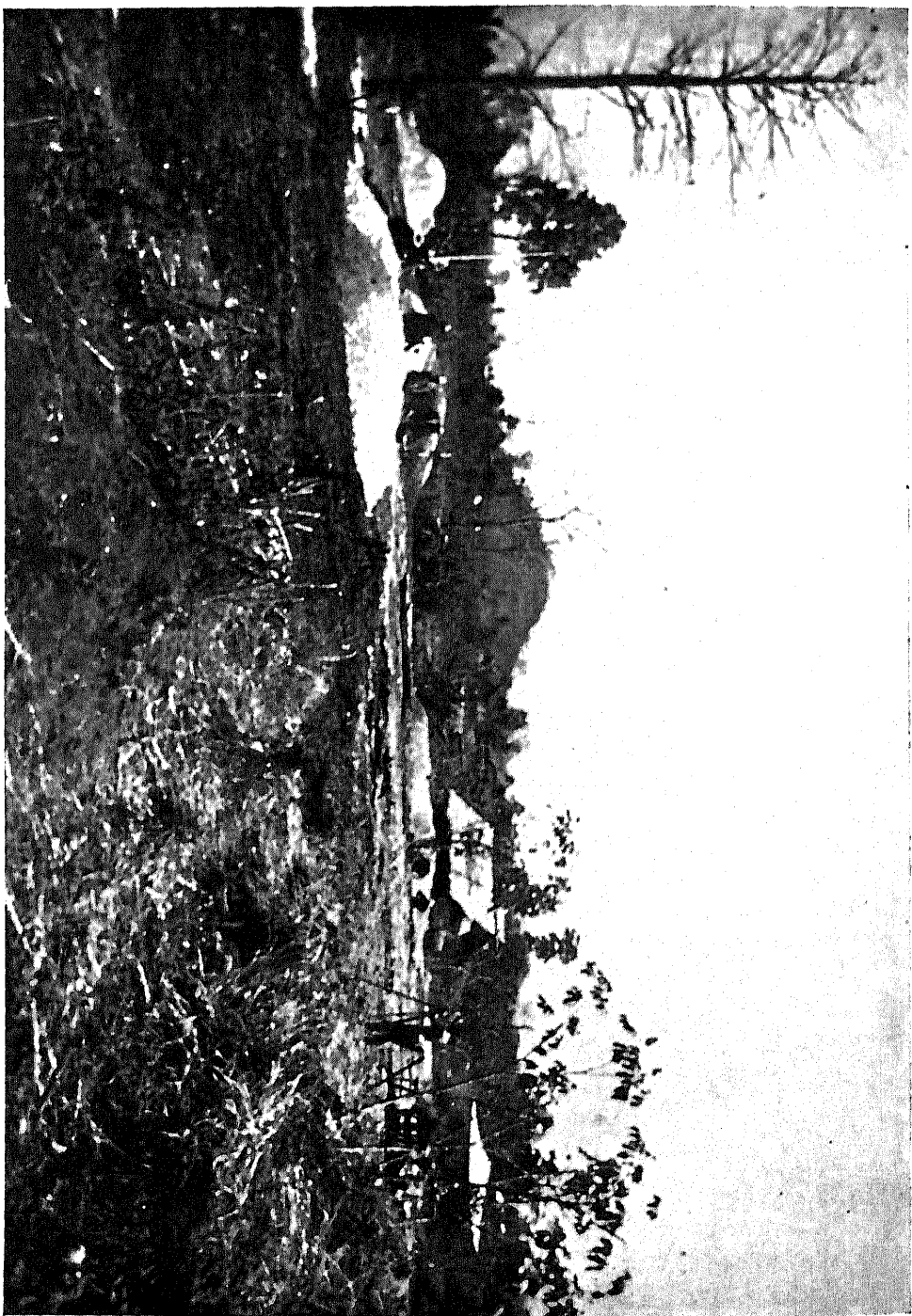


Figure 4  
Kok Charoen  
General view of the site



Figure 5  
Kok Charoen  
Cutting 3: Pottery at the feet of skeleton 3



Figure 6  
Kok Charoen  
Cutting 3: Skelelon 5



Figure 7  
Tham Nguang Chang  
General view of the cave



Figure 8  
Tham Nguang Chang  
Skeleton 2 with bronze axes



Figure 9a  
Tham Nguang Chang  
Burial urn from Cutting 1



Figure 9b  
Tham Nguang Chang  
Burial urn from Cutting 1