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SHANG KO

A study of the characteristic weapon
of the Bronze Age in China in the
period 1311-1039 B. C.

by

James Mellon Menzies, B.A. Sc.

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SHANG KO

Part II

Synthesis of Conclusions

1.

MATERIALS AND TECHNIQUE OF MANUFACTURE

STONE AND JADE

A. The material and its provenance.

Most of the common stones used in the tools and weapons found at Anyang came from the T'ai Hang Mountains or their foothills. The main range extends north and south about fifty miles west of the waste of Yin, but the foothills are not more than fifteen miles distant. The geological formations along this range yield many different kinds of stone and mineral, suited to the use of the stone and "jade" craftsman: slate suitable for sickles, whetstone and harder stones for grinding, polishing and sharpening, have been found near Anyang. Some ornamental marbles, serpentine marbles, and other minerals classed in the western trade lists as ornamental building stones, but suitable in ancient times for making thin blades, have been found in the T'ai Hang range within ordinary carrying distance. Some stone materials may have come from the T'ai Shan mountain complex in Shantung.

The real problem concerns the many well authenticated examples of mineral substances, such as nephrite, which have not yet been found by the geological survey of China in localities inside the Great Wall of China. The problem has been complicated by references to jade, yü, in the most ancient classical literature. Many of these references remain valid, after being submitted to the most rigorous literary criticism. This has led many scholars to conclude that Jade must have been found in ancient times within easy reach of Anyang, Loyang and Sian, the early capitals of ancient China. In the classics the terms "jadestone", yü shih, and "jade", yü, were used to design-

nate not only nephrite and the rarer ancient jadeite, but also other jade-like stones. In Chinese literature, therefore, the word jade, yd, cannot be restricted to nephrite and jadeite as used in modern mineralogy.¹

1. Mr. H. T. Chang of the Geological Survey of China has discussed the references to jade in Chinese literature from a mineralogical point of view (Lapidarium Sincum, Peking 1931, see edit. 1927, pp. 111-156. Chinese text). While these references in literature cannot be ignored, it is evident from Mr. Chang's discussion that the definiteness of the term jade, yd, makes them insufficient in themselves to determine whether true jade was ever found in the places indicated. All the scientific investigations carried on in the areas now identified with those place names have failed to yield any traces of nephrite or jadeite in situ. Some of the kinds of stone called jadestone, yd shih, used in the Shang Dynasty, are illustrated in sickle No. 5, Ho nos. 10-22, 26-29, 36, 37, 62, 63 and 80. The article on "jade" in the Encyclopaedia Britannica, 14th edit. by G. F. Kunz, gives the best summary of the many minerals mistaken for jade, nephrite and jadeite, and those commonly used as substitutes for them in China. Kunz made an exhaustive study of jade as a mineral for H. R. Bishop's Investigations and Studies in Jade, New York, 1906. Even the white marble, which came from Ting Tsien in Kopei province, used in Ho Nos. 25, 26 and 27, was called jade, yd, in the inscriptions on sculptured figures made of this same marble about A.D. 500. Marble figures of Buddha were inscribed "Jade Buddha, yd fo".

The craftsmen of the Shang Dynasty used many different minerals to manufacture the "jadestone" Ho and other "jade" objects found at the Waste of Yin, Anyang. A geological map showing the quarries where these minerals were found indicate the great distances to which the trade in beautiful stones had extended at that time. True jade or nephrite was one of the rarer stones. It was used in the manufacture of sickle Ho. 5 and jade Ho Nos. 10, 11, 14, 15, 17, 22, 28, 30, 31, 32 and 33.² The more beautiful pieces

2. These have not been determined to be nephrite by a specialist in mineralogy, but the writer believes them to be such. There are many other Shang Dynasty jade Ho both of ordinary and miniature sizes preserved in public and private collections in China, Europe and America. It would add materially to this evidence if these jade Ho could be examined by competent mineralogists to determine

how many of them are made of nephrite, which is a silicate of calcium and magnesium, $\text{Ca Mg}_3(\text{SiO}_3)_4$. Jadeite, fei ts'ui, is a silicate of sodium and aluminum, $\text{Na Al}(\text{SiO}_3)_2$, found in Burma. It has been commonly used in China since the end of the eighteenth century, when it was imported into Canton by sea. Before that time it was brought overland through Yunnan in small quantities. It is sometimes spoken of as coming from Yunnan, but it has not been found in situ there. Yunnan traders "discovered" it in Burma in the thirteenth century. Lo Chen-yü possessed a sword pommel made of fei ts'ui said to have been unearthed at Loyang. Judging from its design it belonged to the second century B.C., when trading missions are known to have entered China via the Burma Road. Photographs of this object may be seen in Lapidarium opposite p. 134, Plate III. In western countries Burmese jadeite, of bright green and snow white colour, is believed to be Imperial Chinese jade, but the Chinese themselves did not consider it to be real jade, yu, for they called it by a different name, fei ts'ui. Pelliot, Toung Pao, Serie II, Vol. 13, p. 436, quoting the scholar Chi Yün (A.D. 1724-1805) Yueh Wei Ts'ao T'ang Li Chi, ch. 15, says that jadeite, fei ts'ui, from Yunnan, was not true jade, yu. Its value, however, was greater than that of true jade when Chi Yün was a youth, ca. 1750. Some jadeite is said to be found in the Kunlun mountains, but the writer has not recognized any among the many Shang Dynasty jades he has examined.

notably of the white, light green, yellow and gray varieties, were used to make scribes' engraving knives, pendants and other ornaments.

1. Two engraving knives, made in the form of a fish with the tail sharpened, one of pure milk white colour four and a half inches long and the other of typical mutton-fat nephrite from Khotan, about two inches long, were obtained at Anyang by the writer in 1930 and are in his collection in Toronto. Many other jade ornaments from Anyang are scattered in public and private collections. Some of them have been published in exhibition catalogues and elsewhere. The best authenticated group is that published by Karlbeck, Orvar, "Some Archaic Jade Pendants and their Dating" The Burlington Magazine, London, Vol. LXXIII, No. CDLXV, August 1938, pp. 68-74, Plates I and II, who says inter alia, "Twenty-one of the Anyang objects that illustrate the article were obtained by me in China. Some of them I saw in Anyang". A number of these pendants were typical Shang Dynasty scribes' engraving knives. These should all be examined by competent mineralogists to determine how many of the Anyang jades are nephrite. The characteristic Shang Dynasty designs and the scientific determination of the mineral composition would be additional proof of the presence of nephrite at Anyang in the Shang Dynasty.

The only source of the white varieties of nephrite was in the Kunlun mountains south of Khotan, Lat. 37°, Long. 80°, in the extreme

a year) to have ended about 2000 B.C., i. e.
 accepted for the close of the Shang period in fact, it
 is the point of contact of the
 cultures. The Middle Bronze Age, while it tended to have initial
 elements, covered the period of and the
 expansion of the use of bronze into other fields such as the decorative
 as opposed to the purely useful. At 1200 B.C. the end of this
 expansion and of this period was reached, a date some 50 years later
 than the close of the corresponding age in the West.

Late bronze covered the period of ^{gradual} decline. ^{From its height in 1300 BC}
 deteriorating craftsmanship led to the use of poorer materials
 than to the introduction of a new material, iron. ^{Less gold tin and copper and more impure copper and lead marked the decline in bronze composition}

the Late Bronze Age in China on the continent about ca. 1000 B.C.,
 for there seems to be no trace of iron in the archaeological
 remains. Iron was common in the
 east, iron was common in the ca. 1000 B.C.
 common use in China about 1000 B.C. until the first century after
 Christ. The Late Bronze Age in China, i. e. 1200 to ca. 600 B.C. covers
 the three historical culture fields which have been called in this
 monograph Shang II, Zhou I and Zhou II.

Scholars have been very slow to recognize that the Bronze Age in China
 began as early as it did. Many were reluctant even to concede that
 some of the excellent bronze ritual vessels extant belong to the
 last decades of the Shang dynasty, i. e. ^{just a few years} ca. 1000 B.C. The in-
 scriptions on them have been called "totally archaic" and "picture writing"
 which imply that they were too primitive to be given any survival at
 modern day. It is, ^{by these scholars} however, recommended that the
 the names of persons, families or tribes for whom these bronze

found vessels were... which are... convinced these legends... of the inscriptions... are found also... of the nature... if other evidence... groups or individual... bronze or iron... on the bronze... ritual vessels... of the ritual vessels... the bronze casting... in any way.

These vessels... and give a sense... shortly after 1500 B.C. they... in their sets... indeed it is only... came to decorate their... the patterns they did... involved in casting... evid at that this art... for unless the reader... not yet published... soever among the many... Yin that well... the art of bronze casting... its culture

complex that required the multiplicity of shapes in the bronze ritual vessels which form its major manifestation, must have been previously developed at other Chinese sites as yet undiscovered.

A very high technical skill was involved in casting these bronze ritual vessels so complex in their structure. Many have his solid feet attached to thin and rounded walls; some have movable handles and hinged grids; some have solid lugs and knobs cast (not rivetted) into position; inscriptions were cast in the most difficult places: under the handles, in the bottoms of deep, narrow-necked vessels, under the feet. These vessels were decorated with magnificent designs cast into the surface. The deep-cast crevices which formed the designs were filled with black and sometimes white lacquer inlay.

Many moulds used in casting these bronze vessels have been found at and near the base of Yin. Anyang Report 4 (after page 696, fig. 5) illustrates two of these moulds, excavated by the Academia Sinica. The writer has gathered many fragments of such moulds on the site of a foundry near Hsiao Min village south of Ssu T'ien No village about a mile due west of Hsiao T'un village. These fragments are all from piece moulds which were usually made in quadrants and set several tiers deep for tall vases, Ku. These sections were fitted together both horizontally and vertically by means of notches and "noses" cut into their walls. The use of such moulds was obviously the result of long experimentation. The moulds were made of well levigated loess which had been pressed in little pats against a model. The impression of the two fore fingers and thumb of the artisan may be seen on the back of these little patches. Behind these ridged pieces of finest clay, a coarser backing mixed with sand was pressed until the whole was from 1 to 3 inches thick. On the inner sur-

faces, a black powder which may have been soot or graphite was apparent. This prevented the molten metal from adhering to the mould. In the hundreds of moulds examined by the writer, covered though they were with the crevices of the designs, only one very small particle of bronze^{corrosion} has been found.

Special devices were employed in preparing moulds for complex casting. In the case of tripods and other vessels in which narrow bands of design were to appear in large plain surfaces, thin strip moulds bearing the design were made of very fine loess and were secured in sockets in the face of the master mould by means of knobs protruding from their backs. Heads which were to protrude from the surface of the vessel were added by a second cast. A hole was left in the wall of the vessel as it was cast and metal was poured from the inside through this hole into the mould for the animal head or knob which was firmly attached to the outside. The fusing temperature of the second mixture of alloy must have been lower than that for the body of the vase which would otherwise have melted in the course of the second casting. It has often been pointed out that analyses of samples of bronze taken from different parts of a vessel give different proportions of copper and tin in the alloy. Such irregularities are commonly attributed to technical crudity but it should always be noted whether the positions from which these samples are taken may not have been places where a secondary pouring was made. Such points are the junctions of knobs, lugs, handles and legs to the main body of the vessel. There will ordinarily be at least 2% ^{more tin} more tin requires this much extra tin to weld these secondary castings into position in the alloy at such places. The parts of the vessel in which the inscription was cast will also be found to be

of a better alloy than the remainder of the vessel. This is often indicated by a golden tinge in the material about the inscription. The mould for the inscription was often made separately. If the inscription were inside the vessel it was set into the core. A separate piece was also used for inscriptions under the handle. The square outline of such inset moulds can often be seen impressed into the body of the bronze vessel, although the artisan usually attempted to erase the traces by scouring the surface.¹

1. The writer has in Chooloo University Museum, China, such an inset inscription mould obtained at Anyang.

^PThe same methods as those described above for vessels, apply to the casting of the jo. Methods such as these would not have been developed had the bronze casting been restricted to the simpler jo. The elaborately decorated butts of the jo and the cast inscriptions with their borders and cartouches (cf. nos. 102-107) are applications of the bronze casting technique developed principally on the bronze vessels.



... The casting of the ho.

All ho examined by the writer show traces of having been cast in double moulds. ho 73 shows the overflow which exuded between the upper and lower parts of a flat mould. It was poured from a 'gate' at the point of the weapon. Specimen ho 144 was poured from the butt end where some of the overflow remains. The moulds used for ho must have been similar in construction to the double moulds used for casting knives which were also poured from the end as shown by knife N.O. A. N. 3973 said to be from Anyang. R.O. A. N. 3183 and Yên Châu. One S.O. 3 and parts of double moulds for ceremonial knives buried at Yên Châu, N. N. 1913, also said to be from Anyang. These moulds are constructed in all respects like the sectional moulds for Shang ritual vessels. They were made of the same gray materials fitted together with notches and noses of the same type; and were covered on the inner surface with the same black soot or graphite.

^{characteristic} (no ^{a crucible which is} piece of the bronze caster's equipment is well represented among the artifacts excavated at Anyang. Because of its size it is called by the peasants 'a general's object', ch'iang ch'ün k'uei. The writer has found many fragments of these hard, reddish-coloured vessels. They are made of a special fire clay containing mica flakes and stone grits quite unlike any other clay objects from Anyang. They were found in the heart of the site of Yin near furnace sites where charcoal, burnt earth, broken clay and fragments of bronze moulds were common. The Academia excavated many fragments but none complete. One had a piece of bronze slag, t'ün pien sa, attached to it.¹ Cf. Liu Hsu-hsia's discussion of this crucible.

1. Liu Hsu-hsia, "A study of the Yin dynasty art of metal working, Yin tai ch'ün t'ün, ch'ün ch'ün yün ch'ün, Anyang, R.O. A. N. 1956, p. 681-696, with five plates and a drawing of a "general's

helmet" reconstructed from the fragments, p. 638 and photograph, plate 2.

lien huo, based on information gained during the excavations at Anyang, marks the beginning of objective studies of excavated materials which should lead to a better understanding of the Shang dynasty bronze-caster's techniques.

The writer enclosed a "general" view of these vessels as perfectly cylindrical vessels with a flat base, not more than 0.15. (2 in.) in diameter. The inner lining was a funnel-like lining which acted as a cover to prevent oxidation into the vessel proper. The inner part was made of clay inferior to that of the outer vessel, and acted as a temporary addition. Other fragments showed traces of this inner lining which was not mentioned by Mr. Hitt. The inside of the funnel-like lining was blackened. Some of the fragments of these vessels is blackened outside. In the writer's opinion, they cannot have been crucibles placed in a furnace and fired from the outside. They may have been containers into which the alloy from the adjoining furnace was run and from which it was poured into the moulds. They would have been set in "cups" or holes in the earth near the mouth of the furnace and filled with the alloy. The exact balance would have enabled them to be set on a flat table surface if necessary. The inner, funnel-like lining would have acted as a cover to prevent oxidization. It would also have held back any intrusive slag during pouring. The lips of these vessels were well made, but there appears to have been no narrow spout to guide the molten metal when pouring. A small opening may have been made in the funnel-like lining at the lip to act as a spout for pouring.

We know little of the technique used by the Chang artisans. Experiments in their methods, based on materials like those found on the sites of their workshops, must be tried in order to determine the exact processes followed. Bronze vessels and weapons such as Ho di. are not cast perfect from the mould. The surfaces of all bronze vessels and weapons intended for practical use show traces of a finishing process. As Ho 79 shows the point and edges must have been filed off and ground down on wetstones into their finished form. Filemarks are visible on many Ho. The writer possesses a tempered bronze file which may have been used for such a purpose. Other files from the early Chou dynasty site at Hsien Hsien railway station¹ were in the Honan Provincial Museum in Kaifeng.

1. Twenty-five miles west of Hsien Hsien County town.

The surface of bronze is more ductile and more easily annealed if cooled suddenly after casting rather than allowed to cool slowly, when it becomes hard and brittle. It seems probable to the writer that, immediately the metal was poured into the mould, the whole was plunged into cold water and the sections of the mould removed as soon as possible so that they would not retain the heat. This would account for the gray colour of the moulds. Bricks made in North China are turned from yellow red to various gray by pouring water into the top of the kiln. The parts of the moulding cores left under the handles and under the bases of bronze vessels, as observed by the writer, are a reddish colour and not the gray colour of the sectional moulds. These have been "fired" red by continued contact with the hot metal. The moulds were removed before they turned red again.

CHEMICAL ANALYSIS OF RITUAL VESSELS.

<u>Date</u>	<u>Ref.</u>	<u>Cu.</u>	<u>Sn.</u>	<u>Pb.</u>	<u>Fe.</u>	<u>Ni.</u>	<u>As.</u>	<u>Sb.</u>	<u>Total.</u>
Shang	BM6	62.70	21.30	abs.	T	abs.	abs.	abs.	84.00
Shang	BM10	80.70	17.50	0.10	0.10	abs.	T	abs.	98.40
Shang	BM12	79.20	17.80	T	0.10	abs.	T	abs.	97.10
Shang	BM14	70.50	16.80	6.10	T	abs.	abs.	abs.	93.20
E.Chou	BM17	75.80	12.20	8.80	T	abs.	T	abs.	96.80
E.Chou	BM19	75.10	11.50	10.30	0.10	abs.	T.	abs.	97.10
L.Chou	BM21	61.10	14.70	16.20	1.50	0.10	T	T	93.60
L.Chou	BM24	59.80	7.10	30.50	0.20	0.10	T	T	97.70
L.Chou	BM25	75.70	13.90	3.10	0.50	T	T	T	93.20



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The twenty-one Ko may be grouped in four classes according to the composition of their alloys. In the opinion of the writer these alloys were mixed purposefully with due regard to the intended use of the particular weapon. From the chemical analyses of these alloys it may be possible to trace the sources of the tin, copper and lead ores used and to determine the status of the bronze industry at Anyang when King 'aa Ken moved to Yin.

The four classes of "bronze" are:

1. Tin-copper-bronze alloy as in 70A, 91A, 116A, 131A, 139A and 177A. This bronze was used for ko which were to form part of ritual sets and which were probably cast from the same "mix" as the associated ritual vessels (see IM 8.10.12). Such ko were used in ritual ceremonies where beauty was required but they were also strong and sharp enough for use in war. The Brinell hardness varied from 80 to 100.

2. Lead-copper mixture, as in 38A, 40A, 42B, 47B, 48B and 150A. These were king-ch'i, 'carried' by the escort at funerals and buried in the tomb. Lead was intentionally used as a cheap substitute for tin. The resulting weapons were too soft for use in war. Brinell hardness varied from 31^{to} 52.

3. Tin-lead-copper alloy, as in 60A, 67A, 92A, 152A, 174A, 176A.

This bronze appears to be somewhat similar to the pure tin-copper alloy of Group 1. It is of the same composition as ^{The metal or} ritual vessels with lead content such as IM 14, 17, 19. The addition of lead facilitated the uniform casting of those sets. It seems possible that old vessels were recast by adding lead to the earlier ^{and} pure tin-copper mix. These Ko were used in ceremonies. Brinell hardness varied from 62^{to} 97.

4. Impure copper in 138A, 144A and 41B.

The socketed Ko needed tensile strength. Only sufficient tin, lead or iron was added to secure a good cast. Ko 41B, while containing only a small quantity of tin and lead, must be classed with the lead group (2), for it is cast in the same ming-er'i mould and the blade is too thin to have been useful. The Brinell hardness of 144A is only 38 so that while it is a tough weapon it is not hard.

It is possible to learn more about the bronze technique of the Shang dynasty from a detailed study of these four classes of alloy than from later literary sources.

(Class 1.)

The tin-copper bronze alloy (Class 1) is the most important because the Ko and ritual vessels made from it are among the earliest Shang types known. This bronze is an almost pure tin-copper alloy. Ko 70A, 91A, 121A, 139A, 177A contain from 14 to 17 percent tin; Ko 116A has 3.23 percent. The small quantities of impurities must be assigned to the tin and copper ore/^{matrix}. A large lump (18.8 kilograms) of malachite, a copper oxide ore containing spots of hematite, (iron oxide), was found by the Academia Sinica at Anyang.¹ This, no doubt, had been rejected during the "ore dress-

1. Anyang Report, IV, pp 681 and 696, Plate 1.

ing process. It shows the nature of the ore used. This ore produced in its purer form a copper with 0.1 percent iron. There is a record in the Anyang Hsien Chih, Vol. 5, which quotes the Yeh Ch'êng statement that "Copper mountain, T'ung Shan, is 45 li (15 miles) north-west (of Anyang city). Copper was mined there in ancient times". The writer has visited this area and heard local stories of ancient mine shafts at the village of T'ung Yeh which means "Copper craft". These ancient mines have not been explored.

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The rejected ore found at the waste of Yin, together with the large pieces of slag and the charcoal also found there¹ indicate

1. Anyang Report IV, p. 696, pls. 3 and 4.

that some copper was smelted at Anyang. The writer once secured at Anyang an ingot of copper in the form of a truncated cone² about

2. This was lost in 1927.

five inches in diameter and two and one half inches thick. ^{may be taken} This is evidence that the copper was smelted separately. Some copper ingots may have been imported from a distance. The Academia found ingots of tin in the ruins at the waste of Yin.³ Members of the Geological

3. P. Teilhard de Chardin and C. J. Young, "The Mammalian remains from the Archaeological site of Anyang", Palaeontologia Sinica, Series C, Vol. 12, Fasc. 1; Hankin, 1936, p. 56.

Survey of China, in referring to this material, state "An extensive trade between Anyang and southern China is proven by the discovery in the ruins of the city of ingots of tin". They are not likely to have made such a statement if there had ^{been} any knowledge of deposits of tin nearer Anyang. The early tin routes from far south_n China, where tin is mined, to Anyang in north China should be searched out. The writer believes they were cut off and discontinued shortly after the conquest of Shang by the Chou dynasty in 1033 B.C. The south land was known as Chiao Ch'u State. Many inscriptions on early Chou bronzes tell of the wars against the south. The state of Ch'u was labelled barbarian. The "Elegies of Ch'u" are filled with early Shang dynasty tradition. The state of Ch'u seems to have restricted access to the supply of tin and copper for bronze. In 642 B.C. the eighteenth year of Duke Hsi, the Tso Commentary records: "When the Baron of Cheng first paid a court visit (of allegiance), Ch'ao, to the State of Ch'u, the Viscount of Ch'u, Ch'u Tzu, gave



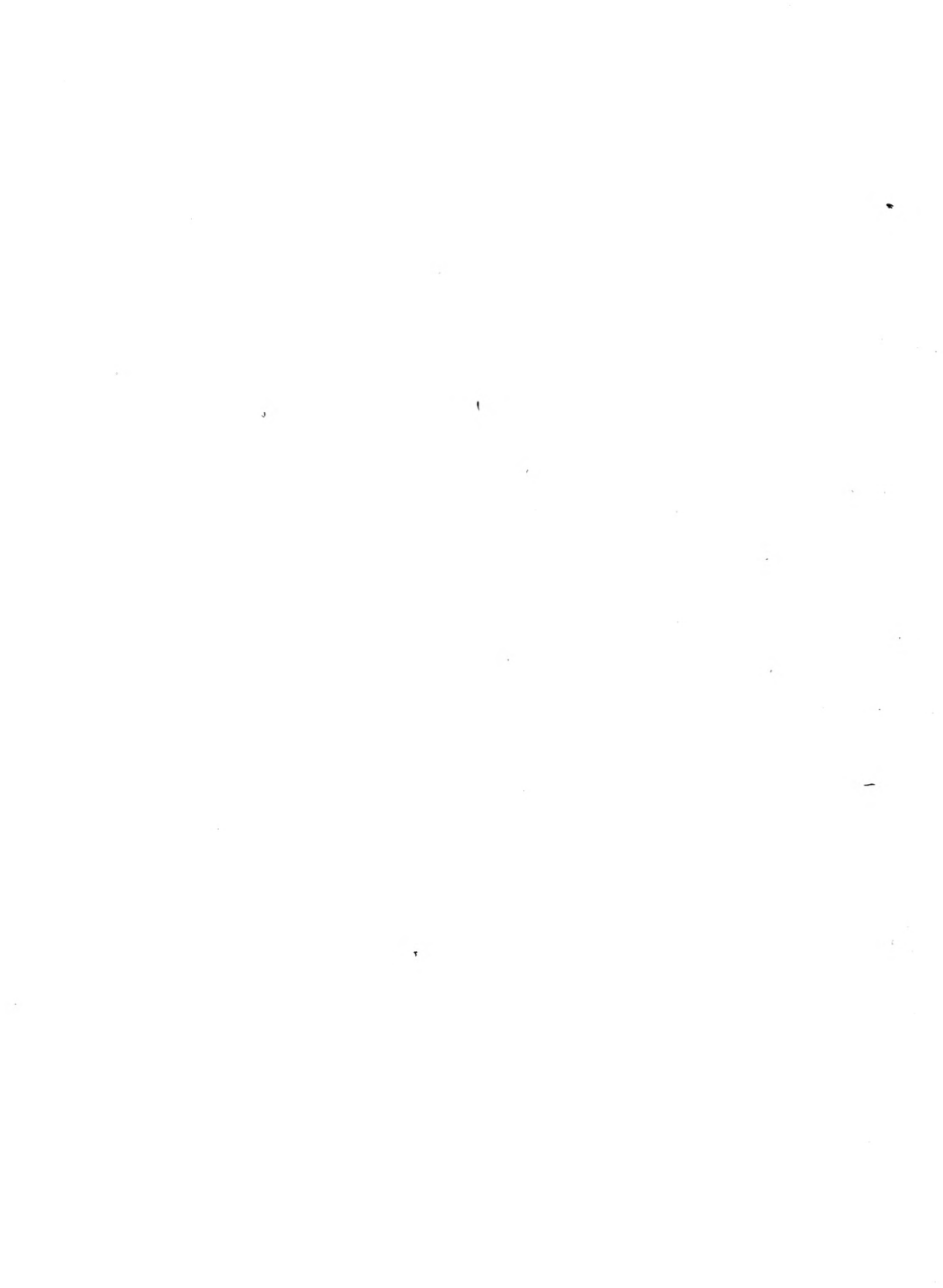
him metal, chia, as a present. After he had done so, the Viscount repented of it and made a covenant stipulating, 'It is not to be used to cast weapons, ku i chu iku'. For this reason the march of Chien cast three bells from it".

This historical reference to the attitude of Chu regarding the export of metal from the south is illuminating. Metal was very scarce in the north. About 450 B.C., for instance, when Viscount Hsiang of Chao, Chao Hsiang tzu, was living at Chin Yang (near present day P'ai yuan, capital of Shansi province) because of Tung An-ya he took the copper pillars, tung chu, of the public palace, Kuang Jung, and made them into arrows¹. When the first Emperor of Ch'in united

1. Records of the various states, Shan Kuo Ts'ie, Chao state. the six states under his sway, 221 B.C., he gathered together all the weapons in the country, Shien hsia chin ping, and melted them down to form twelve bronze man². These and many other references to the

2. Shih Chi history, Shih Hsien Ti ren chi section. melting down of old bronze in late times are common knowledge. But it is not realized that the source of bronze in the Shang dynasty was quite different and that the metal was then *obtained* by the importation of the raw materials.

The analyses of Shang dynasty tin-copper bronze are of primary importance for a study of the original sources of the raw materials. When the early mines are discovered we must search their neighbourhood for the location of the earliest Chinese metal working furnaces and casting shops. The earliest Chinese bronze work at present known consists of the Ko and the ritual vessels. These are so distinctively the product of Chinese culture that this writer concludes that the metal work of China is of indigenous origin and not an art imported



even in a primitive phase from the ancient Near East, even though bronze was in use there more than two millennia before the occupation of the Waste of Yin.

The sources of tin and copper seem to have been accessible to the Shang people from the beginning of the Shang II period (1311-1200 B.C.), which is the probable date of Ho 70, down to the end of the period, (1038 B.C.), which is the probable date of Ho 177. A pure tin-copper bronze alloy was used for most of the more important bronze ritual vessels and the war Ho belonging to the same sets. The composition of the bronze seems to have been much the same in the ritual vessels and in the weapons. The analyses of Ho 70A, type V, made by Professor Desch for Mr. Collins, of Ho 139A, Type VII, made by the Japanese scientists for Professor Unehara, as well as of the ritual vessels Ho 6, Ho 10 and Ho 12 made by Dr. Moss of the British Museum for Mr. Archie Rankston and by Professor Carpenter for the Academia Sinica all yield an alloy of 17% tin or a proportion of about five parts copper and one part tin. This appears to be standard. Some other Chinese ritual vessels resemble in their composition speculum metal which contains 32.78 percent tin.

More analyses of important Chinese bronzes should be made, *but such* should not be restricted to broken fragments of poorer objects. When this is done a ^{complete} more picture of Shang dynasty metal work should be possible. Even now we have more reliable evidence for the composition of Shang bronzes than ^{has} seems to have been available to the author of the 'ao Tun Chi which reads: "There are six classes, chi, of metal alloy, chih. Six parts copper, chi, and one part tin, si, is called bell-and-tripod-class metal alloy, Chun-ting chih chi. Five parts of copper and one part tin is

^{end-} called socket-axe-and-adze tool class, fu chi chi. Four parts of copper and one part tin is called Ko-and-chi-weapon class, Ko Chi chih chi. Three parts of copper and one part tin is called great-blade or sword class, ta jen chih chi. Five parts of copper and two parts tin is called knives and killing arrow class, hsiao sha shih chia chi. Copper and tin one half each is called mirror reflector class, chien sui chih chi."

These proportions have given rise to such discussion. In Anyang Report, IV, pages 679 and 693 the proportion five to two is interpreted as 40 per cent tin, that is two parts out of five. The proportions for Ko, four to one, is given in the Report as 25 per cent or one part out of five. An ordinary artisan, however, would more likely have taken five units of copper and added them to two of tin, so that the tin would have been two parts out of seven or 28.57 percent; while the amount of tin in the class of alloy used for Ko would have been one part out of five or 20.00 percent.

The six classes of metal alloy according to the K'ao Kung Chi should be:

	<u>Copper</u>	<u>Tin</u>
Bells and tripods, <u>Chung Ting</u>	85.71	14.29
^{End-} Socket axes and adzes, <u>Fu Chi</u>	83.33	16.67
<u>Ko</u> and <u>Chi</u> weapons, <u>Ko Chi</u>	80.00	20.00
Great blades (swords), <u>Ta jen</u>	75.00	25.00
Knives and arrows, <u>hsiao sha shih chia</u>	71.43	28.57
Mirrors and reflectors, <u>Chien sui</u>	50.00	50.00

One may judge the age of the K'ao Kung chi by this table of alloy specifications. The very names of the objects place it at the end of Chou III period, because mirrors, chien, reflectors, sui, swords ta jen, and the chi weapon are all imitations into China, ^{most of them} dating after 300 B.C. The poorest alloy mentioned is

for bells and tripods. In the earlier Chou and Shang dynasties tripods were the most important objects and ^{Show} a high content of tin; *clapperless* bells, shung, were ^{and on bell} not common until Chou II, 770-481 B.C.

These tables of the K'ao Tung Chi have been taken too seriously by students of bronze technique.¹ The text is clear but it gives

- 2. Tetts in Lambergopoulos Bronzes, p. 34 presents no portions different from those of the K'ao Tung Chi and attributes them to Biot's translation. They are quite wrong for they link the name of each alloy to the proportions of the one following.

almost no clue to the metalurgy of the Shang dynasty except to suggest the mixture of metals and not ores. It also uses one word, in, hsi, to cover all the metals added to copper. These include lead, iron, nickel, arsenic, antimony and, at a later than date, zinc. The word hsi, translated "tin" is often used in classical writings and bronze inscriptions as a loan word for the homophone "to give" or "bestow". Thus the original meaning of hsi seems to mean "That which is added". It covers both tin and lead and also other metals such as nickel, arsenic, antimony, added to copper to make bronze. The Lu Chia Chia Chi records, "Copper is soft, tin is soft, unite the two softs and they become hard". Other texts which appear to offer clues to the understanding of bronze-casting technique are also vague and unsatisfactory. This writer, therefore, believes that the proper method of research is to examine objectively all the traces of early technique on the objects themselves and in the archaeological strata where they are found. When this data has been studied, we may then seek to construe ancient texts in the light of archaeological facts rather than vice versa.

The results achieved by the Shang dynasty metal workers show a mastery of technique but the reading of ancient texts, ^{such as the Kao Tung Chi} leads only to confusion about the methods used.

Class 2

The metal of Class 2 is a "mixture" of lead and copper₁ with little or no impurities added. The Chinese knew that lead did not make an effective

1. The word "mixture" is used out of deference to those metallurgists who restrict the use of the term bronze to a tin-copper alloy.

alloy. Huei Man tzu in the section on lessons from the customs of the state of Ch'i, Ch'i Hsu hsdn, says, "Lead must not be used in making blades", Ch'ien pu k'o yi wei jen". Lead was considered "black tin". The yu n'ien dictionary says "lead is black tin", Ch'ien wei ho hsi. The whole question of nomenclature for metals is very confused not only in China but also in western languages right down to modern times. It would be quite wrong to judge from the confusion of terms used for metals in classical and Han times in China, that early metallurgists could not distinguish between tin and lead. Lead was apparently cheap. Many ming-ch'i ritual vessels, such as ^{the} lead goblet, chi, R.O.M.A. NB.2722, have been found at Anyang. The objects listed in this class contain from 7 to 18 percent lead and no tin. Ho 42B is an exception to this since it has 2.19 percent tin. This can be explained as the tin content of older scrap metal used. 41B also has a very small content of lead (0.58 percent) and tin (0.60 percent). These two metals even in this quantity are assured an easy flow and cast. We may suppose that all these specimens were made of poor cheap scrap material. 47B and 48D have an arsenic and sulphur content. The Japanese analyst suggests that the addition of arsenic sulphide indicates a "magic" use of orpiment or realgar both of which were often used by Han dynasty alchemists. This writer considers that the lead ore matrix had arsenic sulphide mixed with it and that the sulphide was not entirely removed in the "ore dressing" since the material used was cheap. Some of the ore apparently, contained

also small quantities of nickel and antimony.

In this writer's opinion, the chemical analyses of these two classes, the tin-copper bronze and the lead-copper mixture give us the data for identifying the ore bodies which supplied these materials. The sources of copper are common to both these groups but the tin and the lead are quite separated in the early Shang dynasty specimens. ^{Class 3.} ^{Class 3} later, for ^{Class 3} ore waste was used, ^{Class 4.} ^{Class 4} the impure copper of Class 4 offers no clue as to its source as yet. ^{Class 4.} ^{Class 4} the content could not so easily be assigned to its source. ^{Class 4.} ^{Class 4} of the tin-copper bronze.

An examination of Class 1 suggests several observations:

1. The copper came from malachite, i.e. copper oxide ore with which some iron oxide as hematite was associated. This beautiful green and blue ore would be easily recognized. Some of the copper used no doubt originated ^{near Anyang} in the north as we learn from waste materials discovered at Anyang. On the other hand, we have ^{reports of} mineralogical the existence of similar copper ores in the south in the vicinity of the tin where we must suppose the bronze industry to have begun. These copper ores were not sulphides but oxides which were reduced in charcoal furnaces.

2. The tin in these Shang bronzes seems to derive from a very pure ore body, possibly "stream tin" such as is common in the far south. This tin was shipped north in ingots. No tin deposits are known in the north. The mines in the Altai mountains do not seem to have been the source of any Shang tin. Some of the tin-copper bronze Mo (116A, 177A) contain small quantities of nickel; some do not (70A, 91A, 121A, 139A). It should be possible for expert mineralogists to determine where this tin originated.

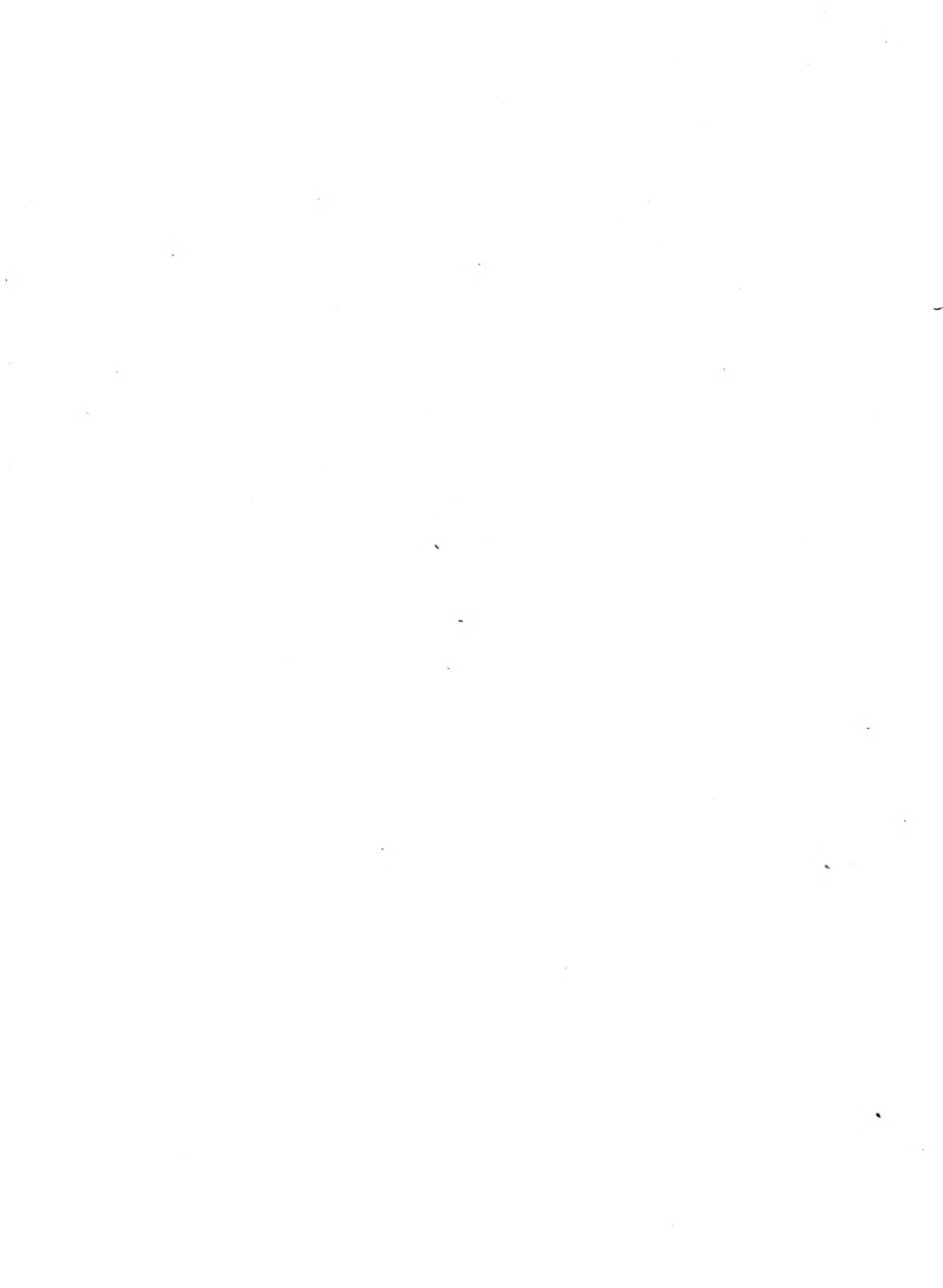
An examination of the lead-copper "mixture" of Class 2 suggests:

3. The lead ore body apparently is associated with some orpiment or realgar, i.e. arsenic sulphide. No doubt this was

excluded from the better articles but cheap, min-qi did not require great care and so these materials, which did not hinder the flow in the molias were tolerated. Had it been included for its magical powers, it would no doubt be found in other than the poorest min-qi.

The traces of nickel and antimony and the minute quantities of gold and silver found by Lo seem to have been mixed with the lead ore.

Tests for zinc, according to Dr. Ross, had negative results. Zinc was not used until the Han dynasty although Chinese Pan as imported into Europe, ^{in 18th century} had a content of copper 40.4, nickel 31.0, iron 2.6, and zinc 25.4 percent.



THE DECORATION OF THE BOWL ON SHANG

Animal style formed the basis of all Shang Dynasty design. Foliage and flowers had no part in it.¹ Shang Dynasty animal

- 1. The so-called plantain leaf or "blade" is in reality an isosceles triangle projected upwards or downwards into the plain spaces ~~an~~ the bronzes. These triangles are filled with conventionalized animal forms and scrolls of the cloud or thunder patterns. The square or angular "scrolls" are called by the Chinese thunder patterns, lei wen, and are supposed to represent the rumbling and crashing of thunder as well as the flashing of forked lightning. The rounded scrolls are called cloud patterns yun wen, and are supposed to represent the whirling storm or the misty floating clouds. When these scrolls are united in bands they may be called a meander in English, but to the Chinese they still remain cloud and thunder.

style was not like the later Scythian animal style, which depicts the hunted animals of the northern steppes and their cruel struggle for life.² The conventionalized animal style found on the decor-

- 2. Branches of this same art are called Sino-Siberian and Ordos. Among the most striking and frequent motifs are fighting stallions, animals biting each other in combat, the vulture, the wolf, rows of deer on the horizon, the ibex, the goat and the ox.

ative bands of design on most bronze ritual vessels of the Shang Dynasty reflects the memories of a still more ancient past, when these animals were more naturalistically portrayed.³

- 3. Animals were often pictured naturalistically on the Shang Dynasty gravy-boat-like bronze vessels called huang. See the elephant on the A.O.S. example NB.4027, Wang Trübner, Yu and Huang, Berlin, 1929 and other examples scattered in various collections. Shang Dynasty wine ladle NB.4024 has pairs of tigers, elephants, water buffalo, deer, snakes, boar, hare and birds placed in realistic apposition on the grip of the handle, and a selection of three of them (tigers, water buffalo and deer) placed back to back on the base that adjoins the bowl. Nestled at the bottom of the ^{top group} is a very lively horned dragon in high relief.

were depicted as restful, but powerfully alive, enveloped in a background of whirling cloud and rolling thunder patterns. The dominant feature of the style was exaggerated round eyes of the



animal, which were often shaped like the stylized human Chinese eye.¹ These eyes look out of the design as a tiger might look out

1. This eye is a common graph in Shang Dynasty inscriptions on oracle bones, and bronzes, where it means the servant or minister who keeps his eye on things for his master^{the King} of his lair at a man. The artist was so absorbed in the eyes and fore part of the beast that the body behind the eyes, jaws and fore legs was always subordinated and often omitted. The animal face was so conventionalized in the Shang Dynasty that it was difficult to identify what type of animal was intended.² The face of the

2. This design has often been called a mask, but the eyes convey the impression of a living animal and not the inanimate skin of a dead one. The writer prefers to call it an animal face; shou mien; since the Sung Dynasty To Lu T'u was published ca. A.D. 1125, Chinese authors have used the term t'ao t'ieh to describe this animal face. This name was apparently based on a wrong interpretation of a chance description of a design on a bronze tripod mentioned in the hi Shih Ch'un Ch'iu compiled under the supervision of Tu Ch'woe (280-235 B.C.), a thousand years after this Shang Dynasty design was common. This description of the design describes a man being devoured, a parently similar to the motif on the Sumitomo wine pail figured in the London Exhibition Catalogue No. 238, or its companion in the Cornuschi Museum, Paris, No. 243. This same motif is found on the handles of kuei, the legs and handles of kuang, and elsewhere. It is quite distinct from the animal face on the decorative bands of design found sometimes on these same vessels and now popularly called t'ao t'ieh by both European and Chinese writers and collectors.

tiger seems to have been dominant in the mind of the artist, but the horns, ears or snout of other animals were also present in variations of the theme of decoration.

The design did not portray the features of any particular animal, but the great eyes rather produced the feeling of the powerful throbbing life common to all the great animals and birds that surrounded the artist originator in his early Chinese environment.³ Shang Dynasty sites producing typical Shang bronzes have

3. These great animals were the tiger, the elephant, the water buffalo, the dragon, whose body seems to reflect the crocodile, the python or boa and other smaller snakes,

the owl, the eagle with hooked beak, the rook or common bird and the pheasant or phoenix with its elaborate tail feathers. The ox, the ram, the wild boar or pig, and the swan, deer were animals slaughtered for the ceremonial feast whose free heads protruded from, rather than formed part of, the tracery design on the vessels. One must add to these the tortoise, the frog, the tadpole, the silk-worm, the cicada, several varieties of fish, the bear, the hare, the monkey, the horse, mule or donkey, for these animals are found on small ornaments made of jade or bronze. The Shang artist was not restricted in his repertory of animals, but the habitat of these animals, reptiles, birds and fishes calls for a warmer and wetter climate than is common now in the dry and dusty region of Anyang, which Dr. V. L. Ting (see Bibliography general) of the Geological Survey considered to have much the same climatic environment in the Shang Dynasty as it has today. If this be true then we must look much farther south for the habitat which produced these animal designs. See Han Yu (AD 768-824)

"The sacrifice to the crocodile", trans. Evan Morgan, *Wen's Styles and Chinese Ideals*, Shanghai, 1912, edit. 1931 pp. 112-115. Giles' *Biog. Dict.* pp. 254-256. Written at Ching-shan north of Swatow

not yet been discovered along the Yangtze river south of it, but the writer considers that the designs common on the Shang bronzes reflect memories of this area. Chü Yuan's poem "The Greater Calling Back of the Soul", Ta Chao, written about 300 B.C. describes "the south" in contradistinction to the east and west and north, which he also describes. The writer was then resident at Chang Sha, or near Hankow. I have translated one verse freely, yet with due regard to the animals and climatic environment:

"Oh thou my soul, thou must not wander to the south,
 The south's a flaming fire O.
 For full a thousand miles of slithering, sliny, serpent's way
 It stretches on and on O,
 O'er mountains high and forests deep and dangerous precipices steep,
 Here goblins, ghouls shriek, and short fox fairies flit,
 Ling python lifts his head, O.
 Oh thou my soul, thou must not wander to the south
 Where vampires spit disease, O."

This southern animal habitat described in words 300 B.C. is very similar to the one depicted in the Shang animal design on the flat bands of decoration of the bronze ritual vessels. The

writer considers this highly conventionalized animal style of decoration to be handed down from a period previous to 1111 B.C. while the free style animals on the wine ladle and small bronzes represent animals copied direct from nature. The horse heads of the Shang dynasty horse jingles picture the horses living at Anyang 1311-1039^{bc}. They do not form part of the conventionalized animalistyle. The tigers, panthers, elephants, water buffalos, pythons, snakes, crocodiles, alligators (dragons), cock fowls, pheasants (phoenix), owls and other animals, birds and reptiles that combine to make up the conventionalized animal patterns with the decorative designs, were taken from a southern climate.¹ The

1. The word south has three distinct meanings or usages in literature. In Chinese classical literature written from the point of view of Sien or Loyang, south always meant the area north of the Yangtse valley. Somewhat in late classical times, 500-200 B.C., south was very vague, and seems to have meant all states south of Loyang and the Yellow River. In early European literature south China meant Canton in contradistinction to North China, which began at Shanghai. In recent times when school geographies are common, Central China means the Hunkow-Chang area together with the Yangtse valley. North China means the territory north of the Yellow River in particular, and South China the provinces of Fu Kien, Kwang Tung, Kwang si, Kueilin and Yunnan, the latter being often included in West China, and not called south. In the writer's opinion the climatic habitat of the Shang conventionalized designs was south of the Yangtse valley area, but Chinese classical references to "the south" are properly interpreted as any territory south of the Yellow River basin. See *Chün ku Lu* 3.1.14 for ^{the} bronze inscription mentioning the south country forged ^{DRACON} 174, secp 25. This was probably Chu state.

designs on the butts of the Ho used in the ritual, especially types III and IV, were similar to those on vessels used in these ceremonies. The full face of the animal design on the vessels divided down the middle in such a way that each half was complete in itself and portrayed the animal from the side. These complete half designs each filled one section of the mould used for casting. Four or six sections of this mould placed nose to nose and tail to tail formed a complete round of two or three animal faces.

The designs on the moulds for each side of the butt of the Ko were similar to those on the vessel sections, but the outline was adapted to the shape of the butt. The nose or open mouth of the animal and the beak or claw of the bird were so oriented as to face the shaft of the Ko when hafted, and leave the impression of the blade issuing from the design.

This peculiar conventionalized animal design filled every part of the area to be ornamented with linear curves and scrolls. The graceful lines were equally spaced to permit the inlay of bands of lacquer or turquoise mosaic. The distinguishing feature of Shang Dynasty design was a sense of line effect, which appears perfectly free from restraint in spite of the rigorous controls exercised by the medium used and the shapes of the butt of the Ko. The artist craftsman knew his materials and used them to preserve in unalterable form the beauty of his line. There was such an affinity between the lines of design and the script on the bone and bronze in the Shang Dynasty that it seems evident they were drawn by the same persons. The diviners were the writers, the writers were the historians, and the same writers of script were also the artist designers who carried the memories of the animals in a more luxuriant climate into the ornamenting of the bronze ritual vessels and ceremonial lo which were used in memorial services for their ancestors.

The decorative designs on the butts of the Ko were much more restricted in scope than those on the bronze ritual vessels and other objects found at Anyang. Animals depicted from nature are rarely found on them.¹ On ceremonial Ko Types III $\bar{1}$ and IV the

1. The horse on Ko 117 is a name graph, not a design. A horse head occurs as a knife handle finial and on harness jingle ends. These horse heads have not been found on Shang Ko.

animal designs were of the conventionalized variety, compressed into the shape of the butt. The designs retained a lively realism suited to the ritual symbolism of the war dance, Ja wa, or court ceremony. Designs similar to those on the Ho are found on carved bone hairpins from Anyang. The relation of the decorated part of the hairpin protruding from the wearer's head to the pin inserted in the hair is similar to that of the decorated butt of the Ho to its blade. The vigorous design of the coiled dragon on Ho 49-52 is also found on bone hairpins from Anyang. The blade or pin is held between the exposed teeth and proceeds out of the dragon's mouth.¹ The word pro-

1. The dragon, lung design appears to the writer to be inspired by the crocodile. These monsters were still rampant at Ch'ao Chou Fu in Kiangtung province north of Swatow ca. Lat. 23°, Long 117° when Han Yd was magistrate there ca. A.D. 820. The writer has seen the mugger (Giles 3388, in the ponds of Indian princes. His movements in the water and his wide open jaws, devouring the large pieces of meat thrown to him by the keeper, suggested the dragon design on Ho Nos 49-52. The presence of the crocodile in the south land was well known in ancient China. In the Han Dynasty an ambassador was sent to Fan Hsun, king of Fu Nan, a country occupying the lower basin of the Mekong river in the region of Saigon, Indo China. The king had crocodiles in a pond in a valley. It was believed that they had power to distinguish guilty persons from innocent ones. The crocodiles devoured the guilty alive but merely rubbed the innocent with their noses and allowed them to go free. The record says that crocodiles measure 30-50 feet (1 foot Han measure corresponds to 231 mm.) They have 4 feet like a house lizard. See Tao T'ung p. 233. The blade of the Ho with the dragon design brings death to the guilty in the same manner as the crocodile in the pond. On the oracle bones the word 'to punish', fa, depicts a Ho striking the neck of a man. Dragon designs changed as time went on. J.C. White, Tomb Tile Pictures of Ancient China, plate LXXI and LXXII, appears to depict the dragon described by Han Fei Tzu (280-233 B.C.). In his book, Chapter III near the end, he says "Now the dragon is a reptile so gentle that he may be patted and mounted to ride. Nevertheless underneath his throat are contrary scales which stick out a whole foot. If anyone knocks against them the dragon will certainly kill that man. Dictators of men also have contrary scales. If a scholar can discuss without knocking against the contrary scales of the dictators of men he must be astute indeed". The "contrary scales" are depicted on Plate LXXI; the rider on plates LXXI and LXXII. This dragon was still a killer of men when angry but had lost his original crocodile-like body, as pictured on the bronze designs of the Shang dynasty or in the oracle bone script (variation 1) Meng-pien 660; 3236, Ch'ien-t'ien 4.54.3, 5.38.3; Hou-pien 3.6.15; Ching-hua II.3; Chien-shou 5.15. same as Hsu-pien 1.31.5; Shih-yi 1.5; F'eng-pien 466. Three other forms have been identified with dragons which

seem to the writer to represent different graphs. Variation 2, Ch'ien pien 6.19.5; 6.43.3; 6.59.4 same as Hayashi 2.25.15; Shih-yi 3.7; Hayashi 2.23.17; Ts'ang kwei 109.3 same as Hsu pien 6.25.6 and joins Hsu pien 3.33.6, same as T'ien-jang 88. Chien shou 8.12. same as Hsu pien 5.25.5; 46.3 same as Hsu pien 5.25.5. Ts'ui pien 1231; 1260. Variation 3 Menzies 127 1409; 1861; 2138; Ts'ang-kwei 62.3; Yi-ts'un 234; 907. Variation 4 is crowned with the graph "to judge and punish" hsing Menzies 2143; Ch'ien pien 4.25.3; 4.29.4; 4.54.1; 4.54.2; 4.53.4; 7.21.3; Hou-pien 1.9.5; 1.30.5; 2.33.4; Ts'ang kwei 105.3; 163.4; Yenching 30; 34; 590; 646; Yi-Ts'un 386; 747; 973; Shih-yi 5.5; Hsu-pien 5.20.2; Chien-pien 6.46.2 and Yi Ts'un 958 picture this dragon led by a hand placed at its head. Other graphs into which the dragon of variation 4 enters are Kung "with two hands below" and piang "under a roof". These appear to be place names.

Ko 53 depicts an eagle or an owl standing on the butt as though the blade were held in its talons. The head of the bird was pointed away from the blade.¹ The other bird motifs were disposed on the

1. Because this Ko had a semblance of tassel prongs it was classified as Type III c.

butt in such a way that the blade appears to symbolize the striking power of the beak or claw. The head of the birds face the blade. The cock-fight which is now so common in China, Indo-China and all the Malay peninsula was well known in the Shang Dynasty. This suggests an interpretation of the 3 different bird designs grouped under Type IV as subtypes A, B and C: (1) Type A (Ko 54-60) and Type VIII D (Ko 156); a cock with claw outstretched below the beak: (2) Type IV B (Ko 61-64); a cock with claw upraised in front of the head, with faces the blade: (3) Type IV C (Ko 65-68) a cock with claw upraised in front of a head turned away from the blade. All 3 designs are attitudes assumed by cocks in combat. They seem to symbolize victory and the death of the enemy.

The writer considers that these 2 designs, the dragon and the bird, do not represent a male and female symbolism. This idea came into Chinese thought with the dualistic Yin Yang school in the Warring States or Chou III period 481-206 B.C. The bird represents the the struggle between equals combatants in the cock-pit, while the dragon-crocodile suggests the justice and power of the great animals carrying out the will of over ruling Nature. The designs also indicate the dread in which such animals were

neld in a tropical land like the tin country of south China and the Malay peninsula. The horned python on Ko 157, a design well known also on Shang ritual vessels, adds another killer from the south.

On the square butts of flat socketed ^{of} Ko, Type V and Type VII there are full-face ^{animal} masks (Ko 88, 92, 133). These are usually grouped under the title P'ao-t'ieh, often translated "glutton". Giles, Dictionary, ll 159 suggests that "the face of an animal and no body on bronze vessels is to be interpreted as a warning against "gluttony". To the writer these masks whether of tiger, ^{water buffalo} ^{or ox} dragon or python appear rather to represent "devourers" bringing death.

The most common type of design on funereal ko is found on Type IIIA, e.g. Ko 34-46. Compare also the butt of jade sickle No 5. The writer has called this a three-animal design. It pictures the head of an elephant with monoloid eye, curved trunk, tusks and open mouth; below this appear the wing, foreclaw and tail of a headless bird seated upon the horizontal shaft of the ko. On the top of the elephant's head a tiger head with pointed ear faces ⁱⁿ the opposite direction from the elephant's trunk. Above these again are two tassel prongs which have no symbolic connection with the design. [Traces of the tassel may be part of the encrustation on Ko 39]. Many Ko with this design have been very poorly cast and the elements of it have not been clear but ³⁵ Ko 36, 37 and other similar ko now recorded here clearly show the ^{different} parts of these three animals.

The significance of this design on many ling-ch'i Ko seems important for the symbolism used in funeral rites. The writer has not been able to find any straight-forward and satisfactory interpretation. ^{in Chinese literature} The design is found clearly portrayed on Ko 35 which is

Inscribed with the two graphs "the great rainmaker", ta yu. The set of vessels and weapons similarly inscribed has been discussed under Ho 35. The date is apparently about 1300 A.D. The origin of this custom must be very early, possibly before the formation of the taste of tin in China A.D. [one then one thousand years after this the Li Chia Chia Chia section Li Chia Chia records "upon the mountain of ... er was revealed a t'iao t'ieh. It had a head but no body. It was devouring a man but had not swallowed him down, when destruction reached its body. San t'ien and t'iao t'ieh, yu shou yu shou, shih jen wei yen, shih chi chi shen". The design on Ho 35 and on all of type IIIA fits this description. The devourer without body is the elephant, the devourer is a bird, not a man; the tiger on the head of the elephant brings destruction to its body.

This term t'iao t'ieh seems to have been associated with the tradition of an ancient people in China called the "Three Sprouts" or San Miao. Tzu-t'ung Dictionary, p. 2467, quotes the comment on San Miao in Shih chih tzu, shih chih tzu section: "t'iao t'ieh means the posterity of the three tribes san tsu who are therefore called the

"Three Sprouts" san miao." The Tzu t'ung also quotes under t'iao t'ieh two words of somewhat similar sound ^{t'iao tsun} from the Classic of Document 38, Numerous Regions To T'iao ^{cf. Legge II, p. 147} as a deity honoured by the people

1. Shih chih tzu 30.1305-39 gives the two Chinese characters.

translates "(Asia) daily honoured the three sprouts in effect." This document belongs to the beginning of the Chou dynasty. The inscription (Shih chih tzu 30.16) dating about 1300 A.D. records the words "order the three tribes san tsu". All this suggests that the idea of t'iao t'ieh, ^{meaning} as a cruel devourer associated with three tribes san tsu of the Chou dynasty ^{and} relates to some symbolic



meaning of the three-animal design on Ko 34-49 of Type IIIA.

This design may have to do with three tribes of the ancient east such as the elephant tribe devoured the bird tribe and was in turn destroyed by the tiger tribe. All three tribes have remnants left which are called the "three sprouts" or San Miao. In the Chou dynasty the San Miao were and may be totemistic in its symbolism. The design may only ^{not of Chou race.}

symbolize the devouring of death. The term ^{Tiao Tieh} has been very much misused by scholars in descriptions of these animal masks. The tiao tieh devouring on bronze ^{of bronze} vessels is much more vividly pictured. ^{than simple masks.} It is found on the handles of bronze ritual vessels. The so-called "Chou hook" often shows the claw and tail of the bird being devoured. The body and wings of the bird form the handle. The devouring head is sometimes an elephant but more often it is another animal. Some of these ritual vessels have early Chou dynasty inscriptions. This does not indicate that this devouring design begins in the Chou dynasty but points to the continuation of the design from early Shang II into the early Chou dynasty.

We must, however, look to the Shang dynasty culture complex for the origins of this three animal devouring design in Chinese art. The ideas expressed were symbolic and not realistic for the elephant is not carnivorous. Ko 36, 37 and sickle 5 have jade blades with this three-animal design on the butt in bronze inlaid with turquoise. These were fit for ceremonies in the royal court as were the elaborate ritual vessels having handles with similar design. The fear of animals is often vividly portrayed in the collection of southern poems called the Eclogues of Ch'u, ^{Ch'u Tzu}, and it is to this southern region we must look for the atmosphere of the symbolism. Here too, is the traditional home of the ancient San Miao.

The square butted Ko of Type V and Type VII are often

inscribed with the ^{graph} of the owner's name. A pair of small dragons with open mouths facing ^{toward} the blade are placed on each side of the graph as in Ko 73, 82, 127, 130 and 131. Headless dragon ^{forms} flank the graphs on Ko 72, 75, 76, 79, 81, 83, 84, 132 and 133.

Triangular Ko 168 presents an intricate design in various planes which is a three-animal puzzle mask. In the design are two dragons, luan, viewed sideways, with ^{water buffalo or ox} bos occupies the middle portion of the design. The whole ensemble suggests the tiger mask.

Ordinary Shang dynasty full face mask ^{on ritual bronzes} can be divided into two halves down the middle so that each half suggests a side view of the animal. In this example, however, the bos forms the central part while the side view of the dragons form the open jaws. This may be only a puzzle, the problem being to distinguish the dragon, the bos and the tiger in the design.

The designs of little men with pointed caps on Ko 163, 169 and 170 present a different problem. These ko have been dated to Chou III or the Han dynasty. The provenance of Ko 169 is Ta'o Mine. The shape of the blades conform to the tradition of the Shang dynasty and are ^{quite} different ^{from} the type of ko which prevailed in Chou III or the Han dynasty. The human figure it must be remembered was not absolutely debarred from Shang design. A typical Shang dynasty jiu is, for instance, shows two figures with elaborate hair dressing and bent arms, ^{which suggest the little}

1. C. E. Loo, An exhibition of Chinese bronzes, 1939, plate XXII, No. 5.

squatting men on Ko 168 169 and 170. which appear to be late in date but to carry on the shape and meaning of the Shang ko.

3.

THE NATURE OF INSCRIPTIONS ON THE KO

The number of inscribed Ko.

Comparatively few Shang Ko were inscribed, possibly not more than five percent. In this monograph the proportion of inscribed to uninscribed specimens does not indicate the true proportions since *because only the uninscribed examples in ROMM were used, except for important variations in type* archaeological context, which is very rarely recorded, the graphs are the only evidence which can assist ^{US} in fixing ^{absolute} the dates of the Ko. The writer therefore ^{into his corpus} collected together all the inscribed specimens ^{for which} ^{complete data}. Most of the objects he has examined ^{and} ^{also set} aside for further study of inscriptions which were not accompanied by the same or less contents of the Ko. Seventy two examples were collected. ^{which} ^{replicates} ^{of} ^a ^{unit} ^{on} ^{Ko} ^{of} ^{different} ^{types} ^{and} ^{on} ^{both} ^{sides} ^{of} ^{the} ^{same} ^{graph} ^{only} ^{as} ^{one} ^{unit}, there are fifty-four different inscriptions:

- 1. The graph on Ko 100 is omitted by the writer now fears that it is cut rather than cast, and that it is a copy of that on Ko 72. He has not seen the specimen but prefers not to include it, for it is a very misleading one for the date of Ko 100. The Ko, both in form and decoration, remains a valuable example of the narrow type III. [^]
The graphs on Ko 171-174 are also regarded by the writer as false and so are not listed.

Types of Ko most frequently inscribed.

The writer considers that the following analysis of the comparative frequency of inscriptions ^{on} the various ^{of Ko} types represents a fair sample of ^{what most probably would be found on} ^{inscribed} ^{graphs} Ko as known at present.

TABLE I Inscribed Ko in this monograph's catalogue.
 Comparative frequency of inscriptions on various types of Shang Ko

Type	Mating	Butt	<u>Ko Cat. No.</u>	<u>No. of examples</u>	<u>No. of different inscriptions</u>
VII	socket	square	117-124	34	17
V	flat	square	70-87	13	15
VI	flat	rounded	95-112 and 115	19	13
VIII	socket	rounded	151-155	5	5
		<u>Total</u>		<u>66</u>	<u>50</u>
Group B Infrequently inscribed types.					
III	flat	tasseled	35 and 11-16	4	2
IX	flat	two slots	159	1	1
II	jade <u>Ko</u>		16	<u>1</u> 6	<u>1</u> 4

Graph on Fo 15⁰¹⁵ is now suspect and not listed. Graphs on Ko 171-174 are believed false and not listed.

TABLE II Additional inscribed ko not in this monograph

List of the more important inscriptions on Shang Ko omitted from the plates in this monograph for lack of blade snare and measurements. The type of Ko can often be determined from the rubbing of the butt near the socket ridge, or the hole at the back edge of the shaft.

- Hsu Yin 2.80.5; socketed Type VII; same graph as Ko 154 (Type VII socketed)
- Hsu Yin 2.80.7; socketed Type VII; same graph as Ko 84 (Type V flat)
- Hsu Yin 2.80.8; socketed Type VII; additional graph.
- Hsu Yin 2.80.9; socketed Type VII; same graph as Ko 81 (Type V flat)
- Hsu Yin 2.81.1 and 2; flat Type V; same graph as Ko 84 (Type V flat). It is possible that this Ko is of Type VII. The rubbing does not give a clear indication.
- Hsu Yin 2.81.4 and 5, same as San-tai 19.7.10 and 9; flat Type V; additional graph.
- Hsu Yin 2.82.8 and 9, same as San-tai 19.7.9 and 8; flat Type V; additional graph.

Table of inscribed Ko combining those of Tables I and II.

Group A Frequently inscribed Types.

<u>Type</u>	<u>Hafting</u>	<u>Butt shape</u>	<u>No. of examples</u>	<u>No. of different inscriptions</u>
VII	socket	square	28	13
V	flat	square	30	16
VI	flat	rounded	20	14
VIII	socket	rounded	5	5
Total Types V, VI, VII, VIII			<u>75</u>	<u>53</u>

Group B Infrequently inscribed Types

III	flat	tasseled	1	1
IX	flat	two slots	4	2
II	flat	jade	1	1
Total types II, III, IX			<u>6</u>	<u>4</u>

As more complete information about Shang Ko becomes available, ^{other} additions will be made to these numbers. The writer has omitted many other Ko of which he was doubtful; ^{and} some of these may ^{ultimately} be proved authentic. The above tables represent present knowledge and the writer considers that the comparative results will prove valid for any future additions. These additions show that "Group A" was still more numerous than "Group B"

Among the specimens here catalogued

sixty-six ^{inscribed} Ko and fifty different inscriptions belong to

Group A

Types V, VI, VII and VIII. These four types appear to form a group on which inscriptions of a similar nature ^{than is with the owners' living name,} were much more

frequent than on other types. Only six Ko and four different inscriptions belong to ^{Group B} Types II, III and IX. No example of

Ko Type IV with the lobed butt was found to be inscribed. Ko with square butts were most frequently inscribed. Types V and

VII have between them forty two examples with thirty-two different inscriptions. ^{Socketed Ko Type VII are more frequent than Flat Ko Type V.}

As seen in the individual studies of their inscriptions, many of these socketed Ko were dated early in the Shang II period. This fact seems to indicate that the socketed Ko was well developed before the move to Yin in 1311 B.C. and suggests that it had been commonly inscribed before that date.

A great many uninscribed socketed Ko of this type have been found in many parts of China but almost no archaeological evidence regarding them is available. Ten examples in the Royal Ontario Museum of Archaeology (Ko 141-150) have been included in this monograph. These common socketed Ko should be studied in their archaeological settings to determine whether they are of the same early date as the inscribed examples.

Date of inscriptions on Types V, VI, VII and VIII.

It is impossible to place the origin of any one of these four types, V, VI, VII or VIII, late in the Shang II period, for some inscriptions in each type are definitely of the early part of that period. The earliest inscriptions are found on the best examples, best, that is, in alloy, ^{in form,} in ^{decorative} design, and in having inscriptions inlaid with turquoise. All four types V, VI, VII

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and VIII were in common use together soon after the move to Yin, Ko 75 of Type V with a square butt has the same graph as Ko 95 of Type VI with a rounded butt and sharp spur. This is definite proof that these two types existed at the same time and the graph is bone-script period ^I in date, 130-1197 B.C.

From the evidence of inscriptions now available the following observations may be advanced as a basis for further study. At the beginning of the Shang II period the socketed Ko of Type VII was commonly used in war by ordinary soldiers and was also the most frequently inscribed weapon placed with the sets of bronze ritual vessels belonging to important persons.

Ko Flat Ko of types V and VI were both equally common but those with square butts may have been more common in early times. According to bone inscriptions the graph on socketed Ko 154 with a rounded butt and a spur at the bottom edge was of early Shang II date. It seems possible that both square and rounded types of butt were in use at the same time during the Shang II period.

Proper sequence in reading the obverse and reverse graphs on the Sheng Ko.

In compiling the catalogue, the writer grouped the Ko into subdivisions of types according to the position of the graph on the Ko; i.e. according as it occurred on the obverse, or on the reverse or on both sides. The study has not revealed any *evolutionary* basis for this subdivision. From the point of view of typology, however, this seems to be the most logical arrangement. It is retained in the hope that future study may discover some explanation for the placing of the graphs.



There is no established practice to indicate which side of the Ko is obverse and which reverse. The inscribed side of the Ko, no matter which side the inscription is on, is now usually called the obverse. This type of ambiguity should be avoided. The writer has therefore adopted the following distinction: the obverse of a Ko is drawn on the face as though the reader were holding the weapon in his right hand with the shaft upright and the point facing left.

Different graphs are cast on the opposite sides of Ko 70, 71, 117, 118, 119 and 151. It is important to know which side should be read first for this reason. These graphs are probably the names of the owner. In oracle bone inscriptions the tribal or estate name precedes the name of a man's office or personal name. This order probably should apply on the Ko inscriptions. It is difficult, however, to be certain of this, for on Ko 117 the graph Ko is inscribed on the reverse while on Ko 118 the same graph "Ko" is on the obverse. It is possible, however, that the graph "Ko" did not mean the same thing on these two weapons. In Ko 117 "verse" may be the tribal name and "Ko" the office of the owner. Now in the oracle bone inscriptions "Ko" is sometimes a tribal name so that on Ko 118, "Ko" may be the tribal name and "Announcer" Kao the office of the owner.

Of the Ko that are inscribed only on one side, about one half have the graph on the obverse and about one half on the reverse. It might be suggested that these Ko were inscribed for right and left stations in the temple service or for a right and left file of an escort of Ko bearers. This does not seem to be so, however,

For the Ko in the sets cited under Ko 35, 44-46, 102-107 all ^{and} have the graph east on the same side.

The orientation of graphs east on Shang Ko.

In most cases the inscriptions on Ko consist of one graph east on the butt. The orientation of this single graph is significant for the custom varied in subsequent ^{Culture} periods. All the examples in this monograph, except Ko 10 and three apparent exceptions to be noted later, follow one rule. The ko was upright and normally read when the shaft was held by the right hand in a horizontal position with the ^{down so that the graph appears} point to be based on the shaft. Since the shaft was approaching, the point of the blade should be held in the hand with the cutting edge of the concave edge to the right hand. In this position the graph on the obverse of the blade will be in the proper position for reading. When this rule is not followed, these single inscriptions are often misunderstood as has been the case with Ko 137. The graph on this specimen really shows a man standing on his feet and not, as has been thought, a man standing on his feet, two quite different ideas.

The graph "to" for the web on itself appears to be an exception to the rule of orientation. It is found on Ko 110, 117 and 118. The drawing of the Ko blade follows that is of the actual blade and the shaft is drawn parallel to the actual shaft, as though the person striking a blow with the ko viewed the drawing of the Ko to be pointed in the direction of the blow. In this case the feeling for congruity in art design overrules the ordinary custom.

Ko 110 has only the single graph but Ko 117 and 118 have each another graph cast on the opposite side of the butt. Each of these other graphs is placed in the customary way. The graph "Annuncer" Pao on Ko 111 is based on the shaft as it should be. On Ko 117 the horse's head faces the point in the direction of the blow being struck and thus at first glance appears to be another exception. But it is to be noted that the graph for "horse" in Chinese is never read as though the horse's feet were standing on the horizontal plane of the ground. In oracle bone sentences such as Shih Lien 3.10.2, in the succeeding bronze inscriptions and in present day writing the graph "horse" is drawn as though walking on the perpendicular line of graphs, head up and tail down. Had he been represented in this attitude on Ko 117, the horse, which is possibly a tribal or family name, would have appeared to be running away from the battle instead of following the Ko into action. Here again the regard for continuity in design overruled the ordinary practice. In the oracle bone sentences and in the succeeding bronze inscriptions the orientation of the graph "Ko" does not differ from that of other graphs; it always stands upright in the perpendicular line of the sentences¹. From these apparent

1. See Shih Lien 6.31.5; 7.12.1; 1.22.1 and Shih Lien 1165.

exceptions we learn that Chinese art design and Chinese calligraphy were closely associated at the beginning of the Shang II period if not before. Ko 117 and 118 may even antedate 1311 B.C. These two Ko are old finds of early Shang Ko from unknown sites. Their graphs are done in the style of bone script of Period I.

Early in the Chou I period single graphs continued to be cast on the butts of ko. A few followed the old Shang tradition.¹

1. San-tai 19.31.2; 19.33.2; 19.36.1.

On the rarer the graph ko is cast when the shaft was held perpendicular.² This rule seems to have predominated, but not still others

2. San-tai 19.34.2; 19.35.3; 19.35.7; 19.35.11; 19.34.3 and a number of vessels excavated by the Academia Sinica at the early Chou site near Tsun-shien railway station.

the graph was oriented in a direction of obliquity to that of the shaft. The position of the blade, vertical and the carelessness of the Chou are nicely illustrated by this minor point. Later in Chou II and Chou III long inscriptions were cast on the ku or curved part of the blade at the fore-side of the shaft. In late Chou III and Han times inscriptions were cut on the sheath after they had been cast. Inscriptions on the blade such as those on ko 173-174 were not found in any period of antiquity.

The meaning of the graphs.

The graphs cast on these ko were the names of their owners. These persons were important figures in the life of the Chuang dynasty. Some of their names have been found on oracle bone inscriptions. This suggests that they were the ancestors of which these persons were called during their lifetime. In the Chuang dynasty we know that the temple names were given after death. A Jiang ku was known as ku, name day and preceded by a temple title in references to him by his descendants after the generation of his sons and grandsons who used the common intimate family names father and grand father.

The names found on the ko appear also on sets of bronze ritual vessels with which the ko were associated. Thus ko 35 and five

others were found in the same pit with a number of ritual vessels similarly inscribed. Some of these sets of ritual vessels have the temple names of ancestors in addition to the "living" name of the owner. These vessels were made for the owner in honour of his father, pu, mother, mu, elder brother, siung, grandfather, tau, or grandmother, pi. On the oracle bones the names of these fathers, mothers, elder brothers, grandfathers, grandmothers and other titles are restricted to the royal family. Inscriptions from more than twenty thousand oracle bone inscriptions have been examined without this restriction being observed, it being possible that similar ancestral names cast on the bronze ritual vessels which likewise were used in ancestral ceremonies, which had been restricted to the royal family. Most scholars believe that bronze ritual vessels inscribed with "father" followed by ^{Cyclical} name day might belong to anyone and little attention has been paid to them as a source of royal genealogical record. The writer considers that inscriptions on bronze ritual vessels are the actual records of royal relationships. Most of these inscriptions consist of only three words: (1) a "living" name of the owner which is used to designate it, (2) a relationship for which we will use "father" and (3) ^{Cyclical} day, one of the cycle of ten days on which the "father" is taken over, possibly the day of his birth.

Consider a hypothetical set of ritual vessels. The "living" name of the owner χ is cast on each article. The set includes o, spears, mao; horse jingles, luai; socketed axe, fu; butcher knife, tao; liquor ladles, yi; four-vosted torii stand; cups, chia; vases, ku; liquor pails, yu; large beakers, tun; small beakers, chin; square ritual cooking pots, fang ting; large round-bottomed cooking pots, ta ting; small-footed cooking pots, li ting; hollow-legged cooking pots, li; food bowls, kuei; animal-covered ^{liquor vessel} gravy-coat, kuan; large liquor heater, chia; steamer, hsien; tall liquor jars, hu; large liquor jar, lei; ^{round liquor jar, β bo and high food stand or basin, β ang.} Most of these articles have only χ the "living" name of the owner inscribed on them. Some vessels however, have additional graphs such as "X father Chia", "X father Keng", "X father Hsin", "X father Yi", "X father Kuei", "X father Chi", "X mother Keng", "X grand father Tsu ting", "X elder brother ku", "X elder brother ting".

This appears to be a mad medley of names without rhyme or reason, but actually such a set might well have belonged to King Wu Ping or to ^{another royal person} χ of his generation. Father Chia is King Hsiang (Yang) Chia; Father Keng is King P'an Keng; Father Hsin is King Hsiao Hsin; Father Yi is King Hsiao Yi; Mother Keng is the wife of King Hsiao Yi; Ancestor Ting is King Tsu Ping; elder brothers ku and ting are known from oracle bone inscriptions; Father Chi also is known from an oracle bone¹ and Father Kuei is known to be his

1. Ch'ien pien 1.27.1 and 3.23.4. Father Chi belonged to the generation of King P'an Keng. This is proved by a broken scapula bone, two fragments of which have been joined: Ch'ien pien 1.27.1 and 3.23.4. The diviner is Yün 1.9 of the first bone script period, 1255-1197 B.C. The bone belongs to King Wu Ping's reign. In the inscription he addresses an uncle as Father Chi associated with ancestor Tsu Hsin, 14th generation, and ancestor P'u Ting, 15th generation. Father Chi cannot be Tsu Chi of the 15th generation, since that would put the bone inscription in

the 19th generation of King Lin Hsin and 'an' (King 1186-1143 B.C. By this time the script had altered materially and Diviner Yün I.9 was long since dead. The script of this bone has some similarity with that of oracle bone Ko sien 1.25.9 which lists in order Father Chia (Hsiang Y'an Chia); Father Keng (P'an Keng) and Father Hsin (Hsiao Hsin) side by side. These three kings were called fathers in this order therefore they were the brother kings named. This suggested the method of dating oracle bone inscriptions and also of dividing them into bone script periods.

brother from bronze inscriptions of which a number are cited under the individual studies of the Ko.

The important fact to note here, however, is that Ch'ing is the living name of King Wu Ting or other royal person of his generation, sons of his father or his father's brothers. Thus we may say that all those "living" names inscribed on Ko which can be linked with ancestral names on ritual sets belong to the Shang royal family. These "living" names were inscribed even on Ming-ch'i sets and buried with the owner in his tomb. This interpretation of Shang dynasty inscriptions explains the variety of ancestral relationships found on one and the same set of ritual vessels. *All the instances cited under the individual Ko seem to conform to it.*

On the oracle bones the king is called simply "the King", Wang. He would, of course, have had a private name while still prince or son before becoming king. Many such names have been found. They are prefaced by the word "Son". The graphs following "Son" however seem to be the names of offices. The writer has gathered more than forty of them from the oracle bones. A number of these are also inscribed on the Ko, e.g. 70, 71, 75, 78, 79, 81, ^{III.}86. Other graphs on the bones, apparently names of generals are found also on Ko 72, ¹⁸⁷98, 112, 129, 136, ¹³⁷and 139. Several diviners' names found on the bones were also cast on the Ko, e.g. 76, 111,

and 127. The same is true of names of tribes or nations, e.g. ko 30, River people; ko 117, horse; ko 130, cattle man; names of officials, e.g. ko 155, is orian; ko 132, Prime Minister; ko 134, Protector; ko 133, Son; names of places, e.g. ko 25, 36, 37, 119-125; names of women's families, e.g. ko 154, Fruit-tree, ko 110, 118¹; ko 80, River.²

1. ko is sometimes written on the oracle bones with a graph for woman beside the ko, e.g. Sh'ien pien C.26.8. indicating that the woman's family name was "ko".
2. River is also written with woman on bone and Ts'ui pien 1483.

In the Tao Chuan, eighth year of Duke Yin we read, "then the Son of Heaven chose out virtuous men he gave them surnames, hsing, according to their origin by birth. He granted them land and chartered them, ming, with a title, shih."³ The study of surnames,

3. Legge, V, p. 34, Chinese text, line 11, English, p. 25 translates--"when the Son of Heaven would enoble the virtuous he gives them surnames, hsing, from the birth places of their ancestors, yin shang; he rewards them with territory and the name of it becomes their clan name, shih." shih is now translated "clan" but in the beginning it was a title or office conferred as distinct from origin by birth.

hsing, and clan names, shih, has given rise to an immense literature in Chinese. It attempts to give the origins of these names in the time of the Yellow Emperor, Huangti, and the model emperors Yao, Shün, and Yu. It is quite beyond the range of this study to do more than indicate that the names on the Shang ko are one source that should be used in the study of the names of people in the Shang dynasty.⁴ More

4. The History Sui Chi, Yin Pen Chi section records, "Emperor Hsün chartered Sh'ü, enfeoffing him with Shang, and giving him "Son" as a surname, Sui hsing zu Chi". The graph "Son" both alone and in combination with woman is common on bone and bronze inscriptions of the Shang dynasty, Ts'ang Hwei 127.1 et al. The surname "Son" Szu of the Shang Royal Family and the descendant state of Sung, may originate in the peculiar use of "Son" in the Shang dynasty. See ko 138.

than fifty names cast on the ko have been gathered together into one co-ordinated group.

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These names are also found on oracle bone inscriptions in definite contexts which will bring to light still other names of Shang persons. These can easily be distinguished from place names by the context. Most important of all, the names of the owners cast on sets of ritual bronzes yield many more names of the same type. From this great number of names, possibly reaching a thousand in all, a new study of the prosopography of the Shang dynasty should be possible. These names are not restricted to surnames, hsing, or clan names, shih. They include tribal names, Tsu, state names, Kuo, regional names, Fang, names of office, Kuan; temple names, ranks, titles of estates, place names and ordinary names, ming, tzu, and hao. The names on the ritual sets of bronzes and on the Ko should however be of a similar nature since they are used in a similar way. They include the important name of the owner by which he was known when living. This name was cast on his Ko and his ritual vessels for use in ceremonies and these were buried with him when he died. Four types of ornamental Ko rarely inscribed.

Jade Ko were manifestly intended for use in ceremonial and not for use in war and it was probably for this reason that they were not commonly inscribed. Their beauty and value lay in the jade itself which was very rare. Stone ming-ch'i imitating jade Ko were used for funerals and possibly for some ceremonies. Jade Ko 16 has an inscription of ten graphs carved at the fore-edge of the shaft. The graphs are in the oracle bone script of period V which in this writer's opinion might be dated a hundred years before the fall of the dynasty in the reign of Wu Tsu Yi, 1142-1139 B.C. This inscription mentions the founder of the Shang dynasty, Ta Yi also known in literature as Ch'eng T'ang. It is therefore definitely of Shang date for no person of the Chou dynasty would

have recorded a ceremonial dance to the memory of a Shang ancestor. This inscription might be thought to have been reproduced from an oracle bone but the writer examined it in New York and does not consider it suspect. The last graph shows a man resting on his heels in the dance holding a Ko aloft in his two hands.

In recent years a number of long Shang dynasty inscriptions of this type have been found on bone spatulae and on bronze ritual vessels. Mr. H. Yu reports a long inscription of thirty-seven graphs on a pail, yu, in honour of Father Ting which this writer considers to be K'ang Tsu Ting, 1150-1143 B.C.

Shuang Chien Yi Ch'i Yin Ch'i Pien Chih Paiping 1940 p. 4

In the inscription mention is made of an elder brother whose ^{Cyclical} name is obscured. This writer suggests that it may be Kuei, elder brother of King Wu Tsu/1142-1139 B.C., who made the vessel in his second year 1141 B.C. This bronze inscription almost parallels the inscription on Ko 16 in that the ceremony is offered to Fa Yi and it ends with the same graph for "dancing" with the addition of the three words "before God above", Wu Yu Shang Ti. This recent acquisition from Anyang is a striking confirmation of the genuineness of the inscription on jade Ko 16. That Ko appears to have been inscribed for use in a special ceremony, possibly about the same time as the pail, yu, 1141 B.C.

Only four different inscriptions have been found on Ko of Types II, III, IV and IX. Ko of types III and IV all have ornamented butts for use in ceremonies. Many are twin end frail ming-ch'i for use at funerals. No example of Type IV has been found inscribed. Two sets of Ko belonging to Type III, one of them Ko 35 with six examples, have two different inscriptions inserted in the design on the butt. The individual studies of Ko 35 and 44



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indicate that the owners had names somewhat different from those of the single graphs of Types V, VI, VII and VIII. The two graphs on Ko 35 "Great rain maker, Ta Yu", are also found on a large set of ritual vessels and spears. "Great rain maker" must be considered the name of the owner as is the case with other sets of ritual vessels and Ko of Type V, VI, VII and VIII. The "Great Rain Maker" set of vessels has only the name Ta Yu without any additional ancestral relationships. This person may not have belonged to the royal family. He may have been the leader of the wizards who danced before God in prayer for rain. There are many reasons for considering that Ko 35 is to be dated early in the Shang II period. Ko of Type III were made in great numbers for use in ceremonies and for funeral use. Possibly they were carried by court functionaries dressed in ritual robes at temple ceremonies. The Ming-ch'i would have been carried by a retinue of servants dressed in mourning clothes escorting the funeral chariot. Types III and IV are not suited for use by soldiers or for the personal use of live generals or nobles. They may therefore parallel Types V, VI, VII and VIII in date. Inscriptions seem reserved for real weapons of war. But wizards like "Great Rain Maker", Ta Yu, and "Great Fire Chief", Ta Muo, and their followers whose profession was the ceremonial dance had their ceremonial Ko inscribed along with their ritual vessels and buried in their tombs.

Ko 159 of Type IX bears the inscription "Island in the midst of a river, Chou". This name seems to belong to the same group of names as those found on Types V, VI, VII and VIII. Oracle bone inscription Ts'ui pien 262 of the Bone script period I,

diviners Nan I.1 and Pin I.4, mentions "The minister of the island in the midst of the river, Chou ch'en". This inscription dates from the beginning of the Shang II period. On the other hand the Eumorfopoulos Bronzes, Vol. 1, Plate XIV, A.17 includes Chou as one of the regions whose people were granted to a noble at the beginning of the Chou dynasty. The writer has obtained a triangular Ko of the same type as Ko 159, at Anyang, and prefers to consider Ko 159 of Shang date rather than early Chou. This single inscription on a Ko of Type IX argues for the existence of this type all through the Shang II period even though the designs on them are very much conventionalized and are placed on the blade of the weapon. This triangular weapon seems to the writer to be more of a pointed axe than a Ko and may have been called by another name, such as K'uei. The slots for hafting are also found on the wide blades of Shang axes, yueh, such as the inscribed axe, a companion piece to Ko 71¹ and the inscribed axe associated with Ko 134². These axes both have decoration on the axe blade as does another example.³ These considerations all confirm the

- 1. Yeh Chung Two 2.19.
- 2. Yeh Chung One 2.9.
- 3. Yeh Chung One 2.8.

writer's opinion that the inscription Chou on Ko 159 refers to the same person as Ts'ui pien 262 and that Ko of Type IX were made at the beginning of Shang II period.

Composition in the Shang dynasty.

It is often assumed that the Shang dynasty scribes could not write long and connected sentences. The series of single graphs cast on Ko and the brief inscriptions on bronze ritual vessels seem to support this view. The Shang dynasty artisan

did not wish to expose the inscriptions cast on his bronzes. He hid them under handles and under the bases of tall vases. In food bowls and cooking pots he concealed them inside the vessels. He inscribed the lids as well as the vessels so that they could not be mislaid, but ^{Tendency} ~~he~~ ~~was~~ not write verbose inscriptions for the sake of saying many words. It was sufficient on a ritual bronze to cast the name of the owner and the temple name of his father if he were honouring him. The ^{cyclical} name day kept the ancestral remembrance clearly in view to avoid mistakes. Sentences on the oracle bones are often long and connected by relative particles showing that a previous sentence is assumed to have been read. Recently, longer sentences on bronzes have been noted. Inscriptions on bone spatulae, and even the skulls of animals as found by the Academia Sinica, show that the art of composition was practised. It is very probable that longer historical documents on wood have perished. That writing was done with a brush, even in the Shang dynasty is proven by examples of artisan's placement notes on stone ornaments in the R.C.M.A. ^{and} the Academia Sinica has also found brush writing on bone.

The single graphs cast on bronze fo of the Shang dynasty and the laconic inscriptions on their ritual vessels simply illustrate the austerity of the Shang people and do not prove their inability to compose longer inscriptions.



4.

THE USES OF THE KO ILLUSTRATED BY LITERATURE

A. Uses in war.

The ko appears to have had its origin in the beaked sickle (No. 1, 2, 3). This implement was usually made of slate or greenstone and was apparently still used by the peasant farmers of the Han dynasty, for more than a thousand examples have been found in the excavations at Anyang by the Academia Sinica. The origins of the stone sickle are much earlier^{than the Shang dynasty}. It was in common use in the Neolithic cultures of North China, wherever grain was harvested (see No. 1). A sickle of the same form but with a blade of jade and haft of bronze inlaid with turquoise was used in Shang dynasty ceremonial. The royal example^{now} in the Freer Gallery of Art in Washington (No. 5) may well have belonged to the King. A sickle of similar type, though made of iron, remains the most commonly used implement in North China today.

The stone sickle was sharpened only on the lower cutting edge, but the upper edge of the point was thinned down for easy entry upon the stalks of standing grain. Because it was always near at hand, this implement was often used for personal defense and in individual combat. When the whole upper edge was sharpened (see No. 4) it was more efficient as a piercing weapon and was called the ko. Except for the rounding of the point the ko has retained much of the "beaked" form of the stone sickle. The evolution of the ko from the sickle as here suggested could not have taken place in the Shang II period, 1033 B.C., but must have occurred long before. The slate^{or} greenstone sickle persisted as a cheap and efficient tool even when the ordinary Shang soldier was armed with an excellent bronze fo (see Nos. 85, 86, 90).

If the ho as a weapon was similar in its fabrication to the ku, then, in its early history at least, it ought to have been a short shaft like the sickle. In the absence of any report of a direct measurement of scientifically excavated ho blades (which no doubt will soon be published by the Academia Sinica from one of its many many antiquities graves excavated at Anyang) a shaft length of 470 mm. (18 1/2 ins.) seems to be the following arguments:

1. 470 mm. (18 1/2 ins.) is the length of sickle ku blades of ho blades were restored. The error from similarity to the sickle blade would be only about this same length.

The shafts of Nos. 15, 16 and 17 have been restored at 470 mm. in plates XV, XVI, and XVII, which are drawn to scale from photographs of the skeletons and objects taken in situ by the Academia Sinica. The ends of the shafts are within one yard of the soldiers' hands. Long shafts, 1500 mm. (59 in.) or more, the ancient Chinese on measure, would not be convenient in these graves. According to the photographs taken in situ the blade if hafted with a long shaft would project into the solid wall of the graves.

2. The ho is not strictly a sword, but is only twice the length of the blade which is about 9 ins. The ho is not a sword, but a dagger, and in the ho is a sword. Picture the ho held in one hand by the end of a short shaft, e.g. Ssu-tai 12.7; 12.10; 12.11, and a ho of 1500 mm. length in the other hand of a boy with a ho on his shoulder, "Ho" (Giles No. 100)

3. This interpretation seems more plausible than any of those suggested by Fetscher, in SPHS 3:107-108; 1, 2, 3, fig. 19. The graph may be written 刀 or 刀 or 刀 the first is primitive. These set consists of: (1) ku, (2) ku, (3) ku, (4) ku, (5) ku, (6) ku, (7) ku, (8) ku, (9) ku, (10) ku, (11) ku, (12 and 13) no others, (14) ku, noted in possession of a curio merchant in Anyang, (14) found

6 ins., i.e. ca. 1825 mm. such weapons are seen on the tomb tiles, e.g. site, tombs in pictures of ancient China, pp. XVII, LI, LII, LXVI, LXVII. But between the Han period and the time of this document (with which the tomb tiles may be approximately contemporary) the sword and dagger did come into use in China and had supplanted the ko for close combat. The soldiers on the tomb tiles carry swords instead of short-handled ko and in place of spears and the spear-iron-handled weapons which are inscribed on the weapon tiles (see Ching p. 41, sometimes as ko).

The ko was the primary weapon of offence used by the Chinese soldier of the Shang dynasty. It is the only ^{so far reported} one known in the records of individual soldiers (nos. 58, 59 and 60). Very literary records go back to the Shang dynasty and therefore there is little evidence from contemporary literature, apart from the brief inscriptions on bronzes and bones. ^{Because} considerable changes no doubt took place in the uses ^{and shape} of the ko down through the ages, it is therefore precarious to employ ^{the following} later literary references to explain Shang dynasty customs. Nevertheless there are several early Chou documents which may carry over the earlier tradition. In the Classic of History, Hu Ching, we find the graph ko used 3 times.¹

1. Documents 17 and 33 are pertinent, ko, but should not be noted as being written in the Shang Dynasty or the beginning of the Chou.

²⁸¹ Of the five ^{references}, two are concerned with war and the other three are all from "The Testamentary Chou" which has to do with court and ritual use. Let us consider the references to war.

Hu index, 28.0074; Legge III 321: King Wu of Chou made a speech at Wu before his troops attacked Shan. He said, "Lift up your ko, try out your shields, set up your spears, sh'ang sh'ang, li kan, li kan, mao".

1. Legge translates "lift up your lance, ko, join your shields, kan, raise your spears, mao".

This was the order to the men to prepare their weapons and stand at attention during the speech. How a soldier with two hands carried out these three operations with three different weapons at the same time has puzzled the writer. The difficulty does not arise with the Ko or the spear. The spear was a long-range weapon. The Po was for close combat, both were necessary. The terms a price to the Ko and the spear are quite different. For the Po it is "Lift li, Ch'eng", for the spear it is "Set up on end, li". The writer has wondered if the word Kan, usually translated "shield", really means "shaft". It often does so when used alone and may mean this when associated with the brand Ko. The two words would then mean "shafted Ko". In this quotation where they are used separately the second operation is ordinarily translated "lay out your shields", and would then mean "measure the reach of your shafts". The full operation of coming to attention would then be: with the right hand grasp the Ko (by the end of its handle), lift it high, measuring the reach of the shaft; with the left hand grasp the spear, nao, setting it straight up with the butt resting on the ground. A long line of these bronze-age soldiers must have been an impressive sight as they shook their weapons in defiance before the battle.

The second pertinent quotation from the Classic of History is Ku Index 49.0037; ^{p612} Book 11: "Temper your ko and spears". nao nao ko nao.¹

1. Legge translates "Temper your lances and spears".

This document is much later than the first but may still be considered early by comparison with most classical references. The word translated "temper" has to do with the process of resharpening blunted weapons by thinning out the edges. It has been discussed under 10 1.2.

In the Odes there are four instances of the use of ko:

Ode 133.1: "I prepare ^{are} ko and spear", tsi shi ko ko. ko ko (IV, 201) translates, "I will prepare my lance and spear"; ko ko (14), "I have lance and spear, both lance and spear".

Ode 151.1: "I consider a ko on service", ko ko shi ko ko (IV, 201) translates, "have their carriage and lance and spear"; ko ko (25), "I have lance and spear".

I have rendered the second two words of the second line in Ode 133 (line IV, p. 118) and elsewhere in all Odes.

Ode 250.1: "I chatted ko ko to elder", ko ko shi ko ko, ko ko (IV, 254), renders "its horns and spear and axes large and small", ko ko (30), "shield and dagger, lance and battle-axe." The second two words are certainly descriptive of the first two as they are in the preceding line. ko ko and ko ko at the end of ko ko shi ko ko. This line is reminiscent of the warrior ko ko for "the ko ko at ko", reads to render ko ko.

Ode 270: "I put under ko ko I staffed ko, tsi shi ko ko, ko ko (IV, 270), "I put under ko ko I staffed ko, tsi shi ko ko, ko ko (331), "I put away your shield and spear". This line is parallel to the following line "I put into the river your lance and arrows".

I have given new renderings to these quotations because of the wrong impressions given in the Chinese commentators' notes and the consequent faulty translations. One often welcomes Mr.aley's fresh renderings but Legge is more consistent. Surely it is straining literary license to render ko by "axe" in Ode 133; by "halbard" in Ode 151; by "dagger" in Ode 250; and by "axe" in Ode 270.

The close parallel in ideas between the lines of poetry of Odes 133 and 270 and the two prose quotations from the Classic of History confirm one another. Odes 151 and 273 show the ^{carried} ko on the shoulder, ^{when} on service and under the crotch of the arm when battle is over. The ko is seen in its proper environment ^{when} the complete Odes ^{are read} and not isolated and over-emphasized as part of the case in a monograph of this sort.

B. The use of the Ko in Ceremonies

The Testamentary Charge¹ portrays ceremonies at the time

1. League III, p. 544-561, Ku Index #2.

of the death of King Ch'eng (1056-998 B.C.) and the investiture of King Wang (996-970 B.C.). This document appears to be as nearly as possible correct and is preserved as is outside of a literary text transmitted from a time too early. It has undoubtedly undergone some, but not all, of the process of interpretation. Archaeological evidence is not sufficient to establish the archaeological, but the Testamentary Charge has received such a thorough critical edition, which con- justice from the object alone can never justify. The entire text may be read in the author's translation which represents the orthodox Chinese interpretation. The following identifications of the ko and its uses in the text are based on a study of all the known Shang weapons² as well as the various types of ko con- sidered in this monograph. The interpretations of commentators ancient and modern have been consulted, and they have been quoted secondary to the archaeological evidence.

A study of this passage in the Testamentary Charge enables us to visualize the place of the ko in ceremonies at the beginning of the Chou dynasty^{in the year} 1122 B.C. The ceremony described fits well into what we know of the Shang-dynasty ritual from the oracle-bone inscriptions. It is possible that it contrasts an actual Shang ceremony modified only by a few new features introduced by the Chou people. Seven different types of ko as included in this monograph appear to be mentioned in the text sometimes by other

names than Ko.

1. Symbols of authority held by the personal body guard of the King. When King Ch'eng was about to die he called the officers of his court to him and issued the Testamentary Charge for the succession to pass to his eldest son Ch'ao. The great historian T'ai Shin recorded the edict on tablets. The great protector T'ai Pao acted as regent in charge of the installation of the new King. He ordered the Marquis of Ch'i to take two officers bearing Ko (Yu Index 13.0207) and a hundred men of the guard, hu pên wei jen, and turn back "Son Ch'ao" (the heir apparent later installed as King K'ang) outside the South gate and conduct him to the mourning room to dwell there mourning for the clan's loss". In this case only two Ko-bearers are mentioned while the guard numbers a hundred men. I have denoted those who carried the Ko as officers; the two men may have been the personal body guards of the deceased King. In any case the pair of them are clearly distinguished by their weapons from the general body of the guard. Ko 49 and 50, 51 and 52, may be two pairs of such symbolic Ko; Ko 53, 54, 61, 64 and 66 may be isolated examples of the same sort. All are so outstanding by reason of their substantial construction, their large size and fine quality, as to suggest that they had been used in royal service. It is to be remembered that these Ko are all of Shang date and that some may antedate the literary text quoted by more than two hundred years.

2. Certain Ko belonged to the personal accoutrement of the King. According to the Testamentary Charge, when the new King had arrived at the royal court for mourning, the ancestral temple

hall was prepared by the servants for the ceremony of investiture. This hall which opened on the courtyard to the south, was divided into three parts, west, east and middle. Four "benches"¹ were set

1. These were probably like the Yuan Fang bronze altar, in the Metropolitan Museum, New York, 130 cm. high by 900 mm. long, (London Exhibition 1936, No. 619A).

on thick mats. The articles spiked out in various parts of the hall have been the subject of much debate which, however, is not pertinent to this discussion. In the east room, ku fan, a ko a bow, and arrows were laid out², evidently in connection with personal

2. Ku Index 41.0647.

accoutrement of the king. Some scholars will they were made by famous artificers of antiquity known as ku fan ku³. This graph

3. See e.g., p. 205.

Tui⁴ may possibly be equated with the graph tui⁵ which means

4. Ku Index 43.0645.
5. Ku Index 42.0408.

"pointed". The writer considers this term to be descriptive of the king's war ko which may have been similar to the better inscribed or inlaid specimens of Type V, ko KC-88 or Type VI, ko 95-114. There is an interesting definition of a ko in the Shi King under the one, ku, according to which the ko was primarily a pointed, piercing weapon. In the Shi King it also defines the ordinary definition of a ko as commentators, "a ko is a pin is hooked chi". Chi is the name of the ordinary iron pin as used in the Han dynasty and found pictured on a Han ben ku ku. The definition continues "A ko means to pass through, ku, kuo yen; whatever is stabbed with a pounding blow will certainly be passed through, so tz'u tao tse chueh kuo; whatever is hooked and drawn, this the point will not pass through", so kou pin tse tz'u chih



fu te kuo ya.¹ This definition, while late, seems to refer

1. The peasants at Anyang today pronounce ko as if it were Kuo.

to the pointed Ko of the Shang dynasty such as Type V or VI as opposed to the more hooked Chou dynasty Ko with a long ku.

The King's weapons were "The pointed Ko, the composite bow and the drooping wing arrows". These are all Shang weapons appropriate to ^{warriors use in} chariots. In the courtyard at the ceremony four chariots were placed ready. The state carriage, the curtained sleeping or travelling carriage, and a first and second chariot².

2. Ku Index 42.0358-583.

No shield was needed nor were other weapons mentioned. There is no dagger or sword and no spear or war axe. The Ko then seems to be appropriate for a King to carry in a chariot along with his bow and arrows.³

3. In the Near East a short war axe was used in chariots.

3. Jade Ko were symbols of rank at court. Among the objects spread out in the east part of the hall was a great jade, ta yü⁴. In classical times it was not known that jade blades had

4. Ku Index 42.0324.

been hafted as Ko. Yet the hafting marks on Ko 13, 14, 15, 16, 17, 18 and 19 are all evident. Apparently jade Ko were called "great jades, ta yü," because of their size and because of the value of the jade. These two graphs were misinterpreted as two other graphs, chieh kuei, which were slight distortions of ta yü. Many jade Ko of the Shang dynasty have been found at

but no "great mace", Shien kwei. The maces described by Lu Fa-ch'un in his Ku Yu ^{whose interpretation was} 10 and followed by Dr. Laufer in his book Made are either of late Chou and Han dates or are fabrications of recent times. Ko 33 in this monograph was recut in late Chou III or Han times from a "great jade" Ko, 390 m. (15 3/8 ins.) long. Even in its present form it reveals the lines of the original ko shape. A microscopic examination has shown that the original and recut surfaces are weathered alike so that the blade must have been reshaped in ancient times. ^{probably the Han Dynasty} The graph Fuei is found in the Tribute of Yu¹.

1. Ku Index 00.1193)

The date of composition of this important document has been much disputed. It is considered to be later than 770 B.C. and perhaps of Chou III period, 481-206 B.C. The substitution of the kuei for the ^{original} Jade Ko as a symbol of rank probably occurred about at the time of writing of the Tribute of Yu. In any case the word kuei was not in use in 995 B.C. The graphs shien kwei, however, are found in the Testamentary Charge² and can only be explained as a later editor's

2. Ku Index 42. 480.

alteration from the original great jade fa-yü, to conform to later ideas. Fortunately the editor did not change the words for the great jade fa-yü which was laid out in the east part of the hall³

3. Ku Index 42.0324.

along with other ritual objects which he could not explain. Chang Kuo-wel in his essay on these jade objects, Ch'ien Pao Shuo in Kuan T'ang Chi Lin, Vol. 1, confused the matter by suggesting that the red knife shih tao laid out in the west part of the hall was similar to the great jade Ko 17 (840 mm. 33 ins. long). ^{This knife was probably a ceremonial butcher knife of bronze. A number have been found at Anyang.} One fact regarding the ceremonial use of the jade Ko stands out amidst all



hall held a cleaver, liu¹ these were apparently two headsmen, one

1. Ku Index 42.0418.

with a Shang weapon, the axe, and one with a Chou weapon, the cleaver.² It is probable that a Shang court had two officers with

2. A cleaver in the Freer Gallery of Art, Washington, No. 34:6, inscribed "Marquis Liang", K'ang-hou is said to have been found south of the Chi River at Tsun Hsien near the village of Lu. Li's'un.

axes. Under the eaves stood two other officers, the one on the west carrying a sh'ü. If interpretations of this weapon as a socketed ko are correct, then Type VII, Ko 117-126 and Type VIII, Ko 151-156 were carried by officers of the guard rather than soldiers. This socketed axe is a typical Shang weapon dating from the occupation of the Waste of Yin. Ko 119-125 are similarly inscribed and other examples with the same ^{graph} are known to exist. Ordinary examples like Ko 141-150 also seem to indicate its common use in Shang times, but it is possible that in the Chou dynasty it had already become rare. No socketed Ko were found by the Academia Sinica in the excavations at the early Chou site at Tsun Hsien station. The ceremonial use of this Shang sh'ü in a Chou ceremony seems to indicate the fusion of the two cultures in state ceremonies. On the west side of the hall, opposite the place where the Chou king ascended, the weapons of the officers guard were of Cheng type, viz. the axe, yüeh and socketed Ko, sh'ü.

6. On the east side under the eaves, a fourth officer stood bearing a kuoi³. This weapon is probably best identified as a

3. Ku Index 42.0430.

triangular Ko of Type IX, Ko 157-167. The Han commentator Cheng K'ang-ch'êng states "the Kuoi and the sh'ü must be the three-pointed spear of today". This is wide of the mark. But the

tradition of three sides may be ancient. These three-sided Ko of Type IX are Shang dynasty in date; none was found at Anyang. But their appearance on the east side of the hall may indicate that they were also well known in the Chou dynasty. Certainly Ko 103, 109, 170, do not conform to Shang canons in their decorative design. In later classical times this graph Ko was written with a usual Hu signific and not a Ko. This graph is inscribed as the name of the Chou III weapon on the Kir of Yen's o which has a Ko ta. It is possible ^{or downward extension of the lower cutting edge along the shaft}

1. Ko-tai 19.50.1.

therefore that a Ko is a Shou ko with a long pu. It might even be one of those peculiar Shou weapons called g found at Anyang, for they have four points, viz. the blade, the lance point, the butt and the long pu or lan dagger. The bronze Shou on alone without the haft has four points like the bone graph for Suei ta (Giles 6453), the tooth stem in cycle of days. This weapon, called by modern writers a Shou d chi, is not found at the Shang site of Anyang but is very common in the Chou site of Hsüan Anyang.

7. Four men in spotted deer-skin caps held Ko on their shoulders with blades pointing upwards ready for action. They were stationed

2. Hu index 42.04.1.

on the south platform of the ancestral temple, one on each side of the two sets of steps leading up to it, and near the four chariots which stood at the foot of the steps. They may have been the outrunners before the horses, Hsün na, who always carried Ko.

3. See discussion under Ko 35 and Ko 117.

From this placing of four men bearing Ko at the very front of the temple we can see that the Ko held an important place in the ceremony and it is possible that the artificer who made many of the

ornamental Ko of this monograph had in mind such ceremonies as the one described in the Testamentary Charge. The Ko occupied the same position in the ceremonial dress of ancient China as the sword did in recent European court dress. No officer was properly dressed without it. The Stories of the States¹ records "Duke Fu put his curved ko on his shoulder and went out to meet the ambassador, M. Kuang heng tiao ho, ch'u chien shih etc."

1. Ko fu, Chin state, Chin pu, ninth chapter.

This is a late survival of a former dynasty custom, such as is vividly pictured in the YC and perhaps even more clearly on a set of bronze vessels ^{now in the R. C. M. A.} This set was found in a brick kiln near Anyang, railway station ^{seen there by the writer} and was and called the "box with the halberd set".

In the inscription on these vessels the halberd is held point up as described in the Testamentary Charge. It is of interest to note that scholastic commentators applied this phrase "trapped a Ko point up", shih ko shang ian, to a spear with an extra point turned up at one side. Yang, III, p. 556, so interpreted it and most Chinese dictionaries still show pictures of Ko carried like spears. No wonder a modern interpreter places more confidence in archaeological evidence rather than in ancient scholastic notes.

3. While not actually mentioned, the presence of the dancing ko is implied in the Testamentary Charge. According to the text, the hereditary dancing costume, the chen tortoise shell, and the great drum were placed in the west room. The war-dances ^{Ta Wu} of the Chou ritual celebrated in six movements the conquest of the Shang dynasty and the pacification of the country. The war-dance, involving the use of the Ko did not originate with the Chou dynasty; it was used already in the Shang ritual. ^{see Chien pien 1.18.4 et al} The dancing costumes

referred to were handed down from the past. The name Yin which describes them is not the name of the maker as Han commentators supposed, but rather "hereditary" as used in the Day of Supplementary Sacrifice.

To sum up: Ko were used in ceremonies mentioned in the Testamentary Charge in eight ways which are also representative of its ceremonial use generally.

1. Two special Ko were carried by the King's body guards as symbols of authority.

2. The large jade Ko wrongly called Chien-t'uei in the text was the symbol of kindly rank presented to the King at his investiture. It was carried by him in the ancestral ceremonies and as one of the national treasures from the past, it was laid out in the Ancestral hall where it was called great jade, Ta Yu.

3. The Great Protector carried a smaller jade Ko to the hall when he offered sacrifice on his own right. This is called in the text Chang and defined as half a t'uei. From this and other references we know that nobles carried jade Ko of different sizes as symbols of their rank. Since however, the lengths of jade Ko of the Shang period are not uniformly graded, the jade blade with bronze hafting is possibly to be identified with the Shang half-jade Ko or Chang.

4. The King carried as his personal equipment a Ko and bow and arrows. This Ko was a short, well made and beautifully decorated weapon called "a pointed Mo", tui chin Ko.

5. In the west part of the temple hall at the ceremony an officer held a socketed Ko called a Ch'ü possibly as representative of Shang dynasty weapons. The ritual Li Chi 22.4.25 says that all four officers, hsiao ch'en, stationed in the hall carried Ko which is a general name for these weapons.

all vessels with the ^{cyclical} day names, chia yi, etc. belonged to the Shang dynasty, but this custom existed even in the middle period of the Zhou dynasty, so this old opinion cannot be entirely accepted."

The uninitiated reader would infer from the above that there are very few authentic Shang dynasty ritual vessels and that there is no evidence that ^{most} vessels inscribed with day names belong to the Shang dynasty. Such inferences would be quite wrong. There are at least 3000¹ inscribed Shang vessels, most

1. The two books Yin wen and 19th Yin alone list a total of over 2400 vessels. Not less than 600 additional are found scattered in many other books and in unpublished collections.

of them having ^{cyclical} day names as well as "owners" names.

It is true that there are only a few long Shang dynasty inscriptions on bronze vessels which bear upon them the full and unmistakable temple titles of Shang Kings and Shang dates. A bowl, kuai, with one such inscription is known to have been above ground for over a hundred years.² Its long text of 35 graphs is

2. It has the seal of the collector Chin Fu-t'ing engraved on the bottom of it. Shortly before the present war the writer obtained this vessel from Mr. C.H. Loo of New York. The inscription is recorded in Yin wen 1.19.3 and San-tai 6.52.2 and transcribed in the writers Chia Yu-fon Miu (Oracle Bone Studies) 1933, . 116.

well known to Chinese scholars and is undoubtedly one of the "less than ten" which Mr. Kuo Mo-jo would recognize as definitely of Shang date. The inscription is composed in the same manner as those on oracle bones beginning with the two cyclical graphs of the day wu ch'en and ending with the month and year of the king. "In the eleventh moon, on the occasion of the kings, wai wang, twentieth annual sacrifice, ssu, the day of the united, hsieh, ceremony reaching back, kou, to Queen Yi Nu and King Ju

(Tsu) Yi illustrious ones, ho; one wild boar". The vessel was made in 1071 A.C. A general, sin, named "Composite" gave to one whose personal name was li "twenty pails, yi of sacrificial liquor and small tokens which he used to make his precious sacrificial vessel in honour of his father Yi". Father Yi was the second last King of Shang, called in literary records Emperor, ^{Yi} (yi). The occasion for which the vessel was made was a special ceremony well attested also on the bones, conducted in honour of Queen Hi-tu and her consort King Yi (yi) whose unmistakable names it bears. The inscription is signed at the end with the "important office or family living name" of the "owner". This graph shows three men gathered around a standard the top of which supports a small graph "prisoner" using which

1. "prisoner" sin is mentioned under ho 76.

seems to be the symbol of authority. The owner's important name may be transcribed li, the modern remnant of which is "to march" or "travel". Had this vessel been inscribed in the early Shang II fashion, omitting all record of the date and the historical occasion on which it was first used, it would have borne only the three graphs: "standard bearers, li," and Father Yi. Precisely these three graphs are found both on the lid and body of the pail, yi, belonging to this set². The associated steamer,

2. Red Yin 1.72.6 and 7, same as an-tai 13.49.1 and 2.

asien, (Yin ên 1.39.7) is inscribed "standard bearers", li, "Grandfather, tsu, ling" i.e. King Wen 'n Ting. The three vessels of this set thus bear the names of three generations of royal ancestors of the owner, "Standards bearers, li". Standard bearer li is the important living name of a member of the royal house belonging to the same generation as Shou in the last King of

Shang.

The genealogical nature of the inscriptions on these vessels provides additional proof that inscriptions on ritual vessels which bear only the living name of the owner and the day name of an ancestor do belong to the Shang dynasty and most probably to the royal family. On the bowl made in 1071 B.C. i.e. near the end of the Shang dynasty, the use of such otiose words as "made this sacrificial vessel, tsu pao yi" had already become permissible. This proves that vessels which use these phrases cannot be excluded from the Shang dynasty on this evidence alone. The occasional use of longer inscriptions on one vessel of a ritual set probably began as early as the reign of King (Liu) Hsin immediately following the death of Tsu Chia in 1157 B.C.¹ In the

1. See No 133.

writer's opinion, the three-graph inscriptions without ^{the addition of} such "unnecessary words" are more often to be dated in the first half of Shang II culture period than near its end. The inscribed No and ritual vessels with a single graph belong to this group.

The fact that day names of ancestors are found on some bronzes as late as the middle period of the Chou dynasty does not preclude the dating in the Shang period of inscriptions which have only the name of the owner and the day name of an ancestor. On Chou bronzes these day names of ancestors are rare and most probably belong to the descendants of Shang who clung to old traditions. There is no evidence that the Chou conquerors adopted the Shang posthumous temple titles which used the day names. Inscriptions on bronze of the very beginning of the Chou dynasty call them King Wen and King Wu. When ^{cyclical} day names of ancestors are found on Chou bronzes they are associated with long verbose inscriptions which praise the merits of the owner's ancestors. The Chou

method of inscribing the date was different from the Shang. The year was called harvest, nien, instead of annual sacrifice ssu. The inscription began with the year of the King, the month and the phase of the moon followed by the cyclical graphs of the day. The compositions were eulogistic, extolling the virtues of King Wen and King Wu and declaring the gift of the mandate from heaven to the Chou dynasty. They recorded charters and gifts of the Son of Heaven and often covenants and records of conquests. It is the writer's opinion that ^{cyclical?} name days of ancestors found on Chou bronzes are the names of ^{persons descended from} members of the Shang royal house ^{who inscribed them}. According to ^{Shang?} tradition the Chou conquerors employed many descendants of the Shang dynasty as officials and permitted them to remember their ^{Shang?} ancestors in regular ceremonies. But these later vessels and their inscriptions exhibit the contemporary fashions of the Chou dynasty.

The philosopher Mo Ti 480-390 B.C.¹ sarcastically described

1. Mo Tzu, Lu Wen section. The date is that given by Professor Ch'ien Mu.

the inscriptions of his time in words which may be applied to all Chou inscriptions. He wrote: "Attack a neighbouring nation. Kill its people. Loot its cattle, horses, grain, millet, goods, treasure. Write it on bamboo and silk. Carve it on bronze and stone. Compose it into an inscription for your ceremonial bells and tripods. Hand it down to your sons and grandsons of future generations and say, 'No one possesses more than I do'". In the time of Mo Ti, bells and tripods, Chung ting, were merely sacred objects on which to record military achievements and the honours granted by the Son of Heaven. Since some of the events recorded on Chou bronzes can be identified in the recorded history of the Chou

dynasty, scholars have judged Shang inscriptions by these later standards and considered that the number of graphs on them were too few to be of use as a source for Shang dynasty history.

Many inscriptions on Shang bronzes have been available to scholars for nearly a thousand years. Cū-yang Hsiū published his Chi Ku Lu Fa Wei about A.D. 1050. The drawings and inscriptions of the great Imperial collection of the Sung dynasty Hsüan Ho Fo Ku T'u Lu were published about A.D. 1125. But only since the discovery of the oracle bone inscriptions at Anyang have we had the key to the interpretation of these brief inscriptions on the Shang bronzes. Up to the present, however, these two primary sources for Shang dynasty history have not been used in conjunction. The links between them noted in this study should lead to further use of this method in identifying names found on other ritual vessels with the names recorded on bone inscriptions. It is only by coordinating all the available information from these two primary sources that we can rewrite the historical and geographical background of the Shang Ko. Before we can understand the kind of information to be derived from these two primary sources we must clearly recognize their nature. Inscriptions on Shang Ko and the associated ritual vessels have been described in a previous chapter. The only information we can expect from them is the important living names of the owner and his ancestral relationships. From the beauty and elaborateness of his vessels we can judge his position in Shang society. Formerly, sets of Shang vessels were not left together but were dispersed among collectors. Recently, several sets have been unearthed at Anyang and kept together. The greater part of two such sets^(The boy with the halberd's set and the man with the jade circle's set) is in the

Royal Ontario Museum. The method of recording inscriptions has also obscured the recognition of sets. The vessels of the set were grouped according to shape in different sections of books of inscriptions. Many of the sets recorded in the present monograph have been gathered together for the first time. Yet it is only by considering the whole set that one can determine the relationship of the owner to the ancestral line of the Shang royal family.

The evidence of the oracle bones.

The nature of the evidence to be gotten from the oracle bones is quite different. These inscriptions are the contemporary records of divination signs or propositions made to the "high bone" in the name of the king. The answer was given ^{to the initiated} by the ^{shape of the} divination crack, ku, produced by singeing the tortoise shell or bone. On the bones the "living names" of people and ^{the names of} places as used in the royal court were recorded. While oracle bone inscriptions do not provide a connected historical record, ^{yet since they do give contemporary names} they are by far the most important source for Shang dynasty history and geography.

In the endeavour to fix the dates of the inscribed Shang ko, the oracle bone inscriptions were searched for similar names. It was discovered that most of the graphs cast on the Shang ^{bronze} ko contained the names of persons mentioned also in bone script period I, dating from the move to Yin in 1511 B.C. to the end of King Wu Ting's reign, 1197 B.C.¹ Many of the graphs on the Shang ^{bronze} ko

1. Mr. Tung Tso-pin, Criteria, p. 373, seems to restrict bone script period I to Wu Ting's reign, 1255-1197 B.C., but this writer considers that many oracle bone inscriptions antedate this reign. Some may immediately follow 1311 B.C.

were also found to be the names of "owners" of sets of bronze ritual vessels of which the ko formed a part.² In this way the

2. Ho 35, 100, 102-107 were all reported by reliable authorities to have been found in the same pits with sets of ritual vessels.

graphs on the Shang Ho became a link between the inscriptions of oracle bone inscriptions with their wide variety of historical and geographical information and the records of the ancestral relationships of the owners inscribed upon the vessels. Thus we learn that the owners of Shang Ho whose names were cast on the butt of the weapon were important persons living ^{at the} bone-script ^{was in use} period I, 1211-1197 B.C.) and that they possessed elaborate sets of bronze ritual vessels. See The bronze vessels of the Late Shang period. See Journal of the Royal Asiatic Society, 1929, pp. 1-15.

It also becomes evident that these sets of vessels are to be dated in the early part of the Shang II period, and that a considerable amount of information about their owners is to be ^{as first} gotten from the oracle bone inscriptions. It has given in turn, a real colour to the names of these persons in the oracle bone inscriptions and has supplied us with their ancestral relationships which could not be learned from the oracle bones alone. The ancestral relationships indicated on the oracle bone inscriptions are those of the reigning king only. The skeleton of Shang dynasty history is the genealogy of the Shang royal house. About one half of the oracle bone divination wishes made on behalf of the reigning king were concerned with proposed royal ancestral ceremonies. From these records it has been possible to reconstruct the genealogy of the kings and queens of the Shang dynasty based on contemporary sources^d and to prove that

^d. See the writer's Shang and Chou Dynasties, (radio, one studies) 1933, pp. 61-125. The names of the queens are not found in the histories.

the records of Shang genealogy preserved in the Han dynasty histories are substantially correct. The kings and queens of

the Shang dynasty are known both in the contemporary bone records and in the subsequent literary history by their posthumous ancestral titles coupled with their name days and not by the "living" names and titles by which they were known during their lifetime. The realization that the "living" names cast upon inc^{inc} and ritual vessels are the names of important persons frequently mentioned on the bones and that many of these had the same ancestors as the reigning king leads the writer to believe that the genealogical skeleton of Shang dynasty can now be clothed with flesh and blood history.

It is true that the inscriptions on the bones are not historical records in the strictest sense. They are the divination wishes made in the name of the king, "proposals" for action rather than the record of deeds accomplished. When on Ch'ien pieh 7.31.4 we read that a divination wish was made "asking about commanding 'standard bearer Chu' (the owner of ko 137) to follow Marquis of Yung (possibly the military title of the owner of ko 70) and make a looting raid, k'ou, upon the state or capital of Chou", we are supplied with considerable historical information even though we do not know whether this proposal was put into effect or not.

We are just at the beginning of oracle bone studies. Ink rubbings of the inscriptions have been published making this historical material available for direct study. The graphs have been listed under the categories of the Siao Wen dictionary compiled about A.D. 100. Unfortunately most Chinese scholars base their interpretations on the Siao Wen definitions which are filled with Han dynasty theories current 1400 years after the floruit of the graphs they are used to define. Even granting the marvellous continuity of Chinese script, this is a wrong method to pursue.

More use must be made of the bone inscriptions themselves and of contemporary archaeological material to determine the original meanings of the graphs. It will then be understood why the translation of cryptic divination sentences is so difficult especially when many of them are fragmentary. Many things, however, have been accomplished. The names of over a thousand persons and places have been separated out although at times the same graph appears to do duty for both place and person. The bone script has been classified chronologically and the names of some 50 diviners have been listed. The genealogy of the royal house has been reconstructed, including the names of the queens who had descendant kings to remember them in ceremonial, and other members of the royal house ^{through they} who did not reign themselves but had descendants who did. A chronology may yet be derived from the cycle of 60 days and the months recorded on almost every bone inscription, but in the meantime we are forced to use a tradition current about 300 B.C. based on the ancient text of the *Annals* found with the bamboo books excavated in A. D. 281 from the tomb of King Aniang of the Wei state in north Honan about 50 miles south of Anyang. When the oracle bones are grouped according to their bone script periods the strikingly contrasted groups stand out. They are (1) the wars written in large bold graphs of bone-script period I to which the names cast on the Ko belong and (2) the hunting travel and wars written in the delicate minute graphs of bone-script period V for which ~~no~~ parallels on the Ko have been found, ^{except the inscription on Mr. G.L. Wirth's Jade Ko No 16}. On each of these groups there are hundreds of names of places and persons which should yield much historical and geographical data. The writer has traced a punitive expedition from Anyang to Linchia in Santung by means

of the inscriptions in the second group and it would be possible from the hunting and journeying directions that the area covered by these place names is the broader part of Period II period. The number of days given in the directions to various places on a journey, should indicate approximately the distance by which they are separated. In the writer's opinion the travels covered most of the cultivated land area of North China and many of the places names are roughly so far which are also administrative centres in the 20th. See Chicago University ^{Journal} No 2, Tsuan, 1933, pp.127-129.

A few of the place names in the third Period I are found among the names of places recorded in Period V, but many of them are different. This leads the writer to conclude that the later travels were carried on in a different area. Mr. Sun Tso-nia (Criteria, p. 336) has set down in a general manner the comparative locations of a number of the important places and regions, fang, in Script Period I. They lie west and north of Anyang and appear to be the names of tribes or nations and places located somewhere along the 800 m. rainfall line which was later fossilized into the great wall separating the nomadic people and the agricultural, city-dwelling people who cultivated the land and developed the arts and crafts of ancient China so well illustrated by the elaborate bronze ho and the bronze ritual vessels recorded in this monograph.

The geography of this area represented by the names of places and peoples found on the inscribed Ho and the associated bone inscriptions extends from the Sitan, Li-shi, (see Ho 99, 102-107) people in the far west to the most important (Giles 628) every nation in the north-west transcribed by Mr. Sun as Li-shi. The "earth round region" T'u fang seems to be located in the north. These are

apparently all foreign enemies. Relationship with the Tibetans seems to have been more intimate than with the other two whose names disappear from the oracle bone inscriptions after the bone-script period I. These foreign invaders were in China from 1311-1197 B.C.¹

- 1. According to Mr. Tung's "long" dates, the period would be 1395-1281 B.C.; according to the orthodox chronology 1587-1266 B.C. The reader will find modern scholars referring to this important period by any one of the three chronologies.

The Wars of Bone-Script Period I

The wars of bone-script period I have been called "the Wars of Wu Ting" from a reference to them in the Classic of Change. Hexagram 63.3 records, "High Ancestor Kao Tsang (King Wu Ting) punished the terrible (demon) region, tsuei fang, and in three years subdued it".² The history of the period preceding Wu

- 2. Legge, Yi King or Book of Changes, p. 206.

Ting's reign is told in the three sections of the P'an Kêng document in the Classic of History³. In their present form and

- 3. Legge, III, pp. 220-247. See p. 221 for Legge's presentation of the orthodox interpretation of the move to Yin. According to this view Yin lay south of the Yellow River at Yen-shin Hsien and the move thither took place from north of the river at Kêng or Tsing. This confusion was traced on the misinterpretation of a graph in the introduction to the Classic of History which seemed to identify Yin with Fo; western Fo was supposed to be at Yen-shin Hsien. The graph was not Fo Yin but chai Yin "to make a dwelling place at Yin".

according to the orthodox interpretation they portray the move to Yin as a peaceful shift of capital from a land exhausted by cultivation and flood to a new and unoccupied Utopia. The

assumption that all the wars of Bone-script period I occurred in Yu Ting's reign seems to rest solely on these two literary suggestions.¹

1. Scholars frequently begin their researches with such historical traditions, place names or definitions of graphs as found in the later classics, histories or dictionaries and the commentaries on them. They anchor the information found in the Shang inscriptions on the oracle bones or bronze ritual vessels to these traditions like a drifting kite tied to a broken stick.

Shang inscriptions antedate by a thousand years the present literary records which were all collected in the Han Dynasty after the burning of the books in 213 B.C. Inscriptions should be allowed to tell their own story, checked only by archaeological evidence. The names of places and persons should not be connected with literary tradition until all the relationships in the bone and bronze inscriptions of that period have been taken into consideration. This is especially true of bone-script period I with which our epigraphic records begin. The graphs on many Go in this monograph are the same as those of persons and places mentioned in references to the wars of this period. The presumption that the graphs are late in date simply because they are cast in bronze can not be allowed to prejudge the case. The date of the Go is fixed by the lifetime of the owner and this is indicated by the bone inscriptions. The name of the owner may have originated in the name (1) of his office at court or in the nation, (2) of the nation, state, region, territory, people, tribe or family which he governed, (3) of the place or city which was his administrative centre. In oracle bone inscriptions the context alone indicates which was meant.

There are about 6000 oracle bones from bone-script period I.

At least 300 of these record the name K'u fang who appear as a people making inroads into the Shang settlements. The name is not found after this script period and it is a moot question at what date within the period these marauders were driven from China.

The only method of deciding whether the bone fragments belong to the reigns of Man Teng, Hsiao Hsien and Hsiao Yi or to that of Yu Ting is by means of the names of ancestors found on the fragments themselves. In all the inscriptions examined, only the names of early ancestors are found. Ch'ien pien 1.23.6 records the name K'u fang and Mother Chi the wife of Tsu Ting. This fragment belongs to the earlier reigns from 1211 to 1256 A.C.¹

1. You pien has the relationship "father" but records no day name. This is a strange omission.

We may, therefore, say that at least part of these wars with the K'u fang occurred before the reign of Yu Ting. That they continued into Yu Ting's reign seems to be indicated by the appearance of grandfather Hsu Ting on You pien 1.29.4 and Yayashi 2.9.14. It is strange however that the name of Father Yi for Hsiao Yi or any other member of his generation which occur so often on oracle bone sentences elsewhere should not be found on this group containing the etnic name K'u fang. Mr. Tung Tso-pin lists 12 diviners' names in bone script period I and others are known to have lived in this period.² Only seven of these names

2. See appendix.

are found in association with K'u fang and of the seven only three, Han 1.1, Pin 1.4 and Cheng 1.5, occur with any frequency. These diviners' names are associated with the earliest bone inscriptions.

The result of this study of the date of the K'u fang's in-

roads into China and their withdrawal from its borders is to suggest that they came in the period preceding Uchin's reign and departed in the early part of that reign.

Oracle bone Ivashii 35.1 has two sentences. The lower and first of them reads, "Inquire about the matter in a ceremony in honour of Ancestor Tzu King." Cheng chin yu tsu king. The second records, "Inquire about not calling out troops to war with K'u fang". Cheng wu hu chan K'u fang. "To war" is here pictured by the blade of one Yo striking at the hilt of another, their handles being held in opposite directions. Although too much should not be read into such a symbolic representation, the form of the graph seems to suggest that K'u fang also used the Yo as a weapon of war.¹⁰ It is an interesting fact that among the many weapons found in China the Yo, axe and spear or some variety of them are the only types known. The sword and dagger so common in the ancient Near East are absent. This again suggests that these foreign people who made inroads into China and possibly caused King Tzu King to move from south-eastern China to Anyang to meet their aggression, did not come from the Near East via the Kansu corridor, but that they were rather a northern people from Central Asia who probably occupied the basins of the Ob and Yenisei rivers. The archaeology of this region is being studied by Russian scientists and we may expect light on this problem from them in the future. This area appears to have ^{produced} archaeological material with ^{to that obtained from} similarities with the Perm region of the Urals and so further west to the Baltic.

The halberd in Bronze Age Europe is said to have spread in succession from Spain to Ireland, England, Scotland, Saxo-Thuringia,

Sweden, Lithuania and Slovakia but never to have been adopted in

Silesia, Czechoslovakia, Hungary, southwestern Germany or France.¹

1. V.G. Childe, *The Bronze Age*, Cambridge, 1930, pp. 87-89; Sean P.O. Riordain, *The Halberd in Bronze Age Europe*, *Archaeologia*, Vol. 36, Oxford, 1936, pp. 195-221, distribution map, p. 277, fig. 58.

Both Childe and Riordain (p. 223) mention the supposed halberd with gold-capped rivet from Heft Grave VI at Aycelles. They apparently depended on Evans' *Excavation of Minos*, II, p. 177, fig. 67, which gives no impression that the weapon is as much as 850 mm. long. Cf. Karo, *Die Scheitgräber von Lykensis*, No. 928, p. 163, pl. KCV. The writer attempted to haft this weapon as a ko from careful drawings but was convinced that it was in reality a symmetrical but worn sword.

The slanting row of rivets may not be in their original position. From Karo's photograph one side appears to have been restored and to have thrown the rivets back. Karo notes that the tan; was restored. The blade should be re-measured to determine the correct position of the rivets. It bears no resemblance to the beaked halberds of North Europe. The two small bronze sickles from Desklo and Hana, lengths 13.2 cm. and 11 cm.² do not seem to be related except insofar as they

2. V.G. Childe, *The Dawn of European Civilization*, p. 87.
 Gerald Inghall, *Early Iron Age in the East*, 1940, p. 27, note 5, plate VII.3.

are grain sickles. The pictures on cylinder seal figures from early Mesopotamian sites appear to this writer to represent axes such as those found at 2 and not beak-shaped halberds or ko.

The European distribution of the halberd noted above leaves out of account the very early appearance of the halberd in north central Russia, in northern central Asia and in all China. While the European halberd is hafted with copper rivets, in shape it is very similar to the Chinese ko. The upward sloping tendency of the European halberd approximates more to the shape of the Chou dynasty blade except that the European blade never developed a hu. The Chou blade is to be dated 1039 B.C. after the Shang ko but it may represent a development

of a type that had begun in northwest China at an earlier date. If the halberd or Ko was a common weapon of offense in northern Eurasia and China in the earliest bronze age, the possibility of this weapon having spread into Europe from the east should be explored as an alternative to the theory that the halberd originated in Spain. The contiguity of the areas using the halberd or Ko from Spain through northern Europe, north Russia Southern Siberia to China demands an explanation as much as does the absence of that weapon from south central Europe and the ancient Near Eastern world. The Shang Ko was a highly developed weapon at the beginning of Shang II (1511 B.C.). It is not impossible that the European bronze-age halberd, like the Ko, had its origin in the Neolithic sickle of northern Eurasia. The two weapons might be regarded as different expressions of the same development from a utilitarian sickle to a weapon for war and a symbol of rank and power. The presence of the sword in bronze-age Europe along with the halberd may indicate two streams of influence, one from the Near East and one from the Far East by way of the northern steppes and rivers.

1. Lortz's plate of Chinese Ko, p. 131, No. 109 is a very mixed group and somewhat misleading. They are by no means to be "regarded as belonging in the main to the Han dynasty (207 B.C. - A.D. 220)". Only the non-C pieces are so late. The writer dates these Ko as follows:
- No. 3 is Shang II, type V, 1511-1059 B.C.
 - No. 5 is Shang II, type VII.
 - No. 6 is Chou I, 1059-771 B.C.
 - No. 1 is possibly Chou I.
 - No. 2 is possibly end of Chou II, 770-481 B.C.
 - No. 4 is end of Chou III, 481-207 B.C.
 - Nos. 7-10 are probably Chou III to Han I, 481 B.C.-A.D.220.

The rivet holes of No. 3 are not ordinarily found in Chinese Ko. Nos. 7, 9, and 10 are more Siberian than Chinese in type.

There is a marked difference between the Shang Ko and the later Siberian form found in the Minussinsk area. The

division line between the North Eurasian bronze age cultures, and the Chinese, is not the same as the great wall of China and not west of the real mountains. The interrelation between the bronze age cultures of ca. 1300 B.C. and that of the Chinese has not yet to be clarified; the date ^{habeyas} is at least 500 years old, valid for southern Iberia.

From the point of view of a strict division, there is only one Korean halberd which resembles the Chinese one in shape, size and artifact. It is described, op. cit. fig. 2, with a length of 30 cm, also 10 cm and a p. 21. The halberd in the real collection, it means, is very different in shape and artifact. It is also described, op. cit. fig. 3, with a length of 40 cm, also 10 cm and a p. 22. The halberd in the real collection, it means, is very different in shape and artifact.

According to Bailey, swords are found in the areas from which the Hall and Siberian halberds came. Bailey, ibid., III, 1911, 96, see Morrison, op. cit., p. 232.

Many copper sickles are found in the fields of the Venisei and the Ob river basins. The people of the oldest bronze age in the region were settled agriculturists and the oldest, ibid. p. 168, ibid. Cambridge, England, p. 246, fig. 168, hafted bronze sickle, length, 100 mm. to 150 mm.

A P P E N D I C E S

A. ... IV ... NOV ... 11 ... 11 0 ... 1.

Proposed

this ... number of two ...

(1) to ... 11 0 ... 1.

for the occasion of the ... date of the construction of the ...

(2) to ... historical ... order to facilitate ... already ...

is now ... of date:

(1) to ... Dynasty.

... correct to ... of the ...

(2) 'The ... the '...', *Yu Pien Chai San Chai N...*, ...
after the ...
written in 2008 ...
before ...

Data ... of date:

1. The ... until the founding of the ... of various ...

2. The ... until the founding of the state of ...

3. The ... of ... 200 ...

The second and third parts of data ... covered by ...

Bamboo Annals. This represents an unknown editor's attempt to complete the "Ancient text" available to him in order to make it correspond to the summation period of 273 years. It may be based on more old data than we recognize. By comparison with Column 2 which gives the orthodox lengths ascribed to the various kings in the Han dynasty it is possible to see some of the sources of Mr. Tsang's adjustments. Only in the cases of Hsiao Yi and (Ti) Yi does he differ from both. In Chinese reckoning the full year or time in which a king died was included in his reign. The new king counted his own reign from the beginning of the new year following. The remainder of the old year was part of the period of mourning when the ministers of the old king continued his rule and installed the new king in office. The dates given in Column 1 are the first years of each new king, the former king having died during the previous year.

I A Table of the Chronologies of the Shang II Period.

Shang Dynasty Kings	Tentative Chronology	Reign lengths, Tang's and adopted	Present Bamboo	Orthodox	Orthodox Chronology.	<i>Present Bamboo See Johannes MH appendice III Vol. I p. ccXLII. 1315</i>
F'an Keng	1325	28	28	28	1401	
Move to Yin	1311	14	14	14	1387	1301
Hsiao Hsin	1297	21	21	21	1376	1287
Hsiao Yi	1276	21	10	28	1355	1284
Wu Ting	1255	29	29	29	1336	1274
Tsu Kung	1196	7	11	7	1285	1215
Tsu Chia	1189	22	22	22	1263	1204
(Len) Fein	1156	5	6	6	1226	1171
K'ang Tse T'ang	1150	3	3	21	1219	1167
Wu Tse Yi	1143	2	2	1	1198	1157
Yen Yu Ting	1138	13	13	3	1194	1124
(Ti) Yi	1125	35	9	37	1191	1111

(Chou or Snou or Ti[nsin	1090	52	52	32	1154	1002
Destruction of Shang	1038				1122	1050

The chronology of the Chou I period, 1038-770 B.C. does not readily yield a satisfactory division of the 267 years into the reigns of the kings. The writer prefers the Present Text of the Bamboo Annals although they have been mutilated by a later editor because the chronology given is based on an ancient text and no doubt preserves a clue of it. In a note the editor says he altered the 267 years by adding 24 years at the beginning, before the supposed transfer of the tripods to Lo Yi, making 291 years to which he added 11 years of King Tu, making a grand total of 302 years, see Legge III, p. 133. (His dates are all one year short as a result of his understanding of the year 1 B.C.) The Chinese editor however did not follow his own computation, for the years he gives to the individual reigns total 250 to 770 B.C. or 269 to 791 B.C. The latter is 12 years in excess of the total 257 years. The writer has taken the length of King Ho's reign to be 14 years, which is given as the supposed King Ho Interregnum instead of the 26 which the editor assumed. This difference of 12 years offers a solution of the problem without altering the other reign lengths. It seems to the writer that this is where the editor became confused and departed from the Ancient Text of the Annals.

There are two quotations given in Wang-tsu-tai's edition of the Ancient text of the Annals of the Bamboo books, Ku pen chu chu shi nien which refer to King Ho.

1. "Ho, baron of Kung protected the King's throne, Kung ho ho kan wang wei". From this we learn that King ho was the name of a person and not of an interregnum.

2. The second series "ho or hang in the fifth year" and ends "in the year... of Lou Hien...
 throne", "Huan ho...".

This... evidence... of these reigns, recorded in the first century...

are not to be... be adjusted to the total series of... 4.3.1 records...

...in the... no... long... destruction of... of...

Chou dynasty	1870-1810	1800-1740	1730-1670	1660-1600	Orthodox	Present Bamboo See Giovanni's MH appendix III Vol 1, pccxlii 1050
Yu	117	5	6	7	1122	
Ch'ien	1032	37	37	37	1115	1044
Hian	101	8	26	26	1078	1007
Chao	219	19	19	51	1052	981
Yu	950	55	38	33	1001	962
Hsin	355	13	12	11	946	907
Yi	812	25	25	25	834	895
Shiao	808	9	9	15	909	870
Yi	849	5	6	16	894	861
Li	641	14	20	37	76	853
kung Ho				11	811	

Hsual	827	46	46	46	827	847
Yu	781	11	11	11	781	781
P'ing	770				770	770

After the move to Lo Yi at the beginning of King Liu's reign the correct dates of the kings of Chou follow the orthodox chronology. This is not true however of the dates of the rulers of the various states which were very much confused in the orthodox computations and correspondence tables.

This study is limited to the second part of the Shang dynasty for the greater part of the objects have come from the site of Yin, Anyang, in North China. This period has a cultural unity which may be designated Shang II for purposes of general description. The span of time is 276 years from 1311-1035 B.C. These exact dates are taken from the ancient table of chronological records current about 300 B.C. They are considered more correct than the orthodox chronology calculated in the first century A.D. which gives 1367-1115 B.C. The later 1198-1115 B.C. are a modern combination which adds the 276 years of the Ancient Text to 1115 B.C. of the orthodox chronology.

The Ho was already in use before the beginning of Shang II, i.e. in Shang I. The Ancient Text credits to Shou I 345 years, from 1834-1489 B.C. The historic period preceding Shou I is given as 471 years and dates back to 2305 B.C. The Ancient Text calls this the Hsia dynasty. It is a moot point whether this is a suitable term. The bone inscriptions refer to a long series of historical personages antedating Shou I. There is as yet, however, no sure proof of the existence of another historical

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dynasty separate from and antedating the Shang. The writer believes that historical time as recorded on bone inscriptions dates back to 2000 B.C. This length of time at least is required for the development of the high state of bronze culture existant at the beginning of Shang II and illustrated by Ko in this monograph and by the sets of bronze ritual vessels to which they belong. The writer would be quite willing to accept the terms Hsia I and Hsia II to cover the 471 years attributed to that dynasty, for he believes that some such term is desirable for designating an historical period. It is evident that Dr. G.D. Wu in his Prehistoric Pottery in China, London, 1938, had the same difficulty about the inclusion or omission of the Hsia Dynasty and the implications of the term Prehistoric artifacts from culture strata of individual sites such as those presented by Dr. Wu in Table 5 on page 170 are best designated by the names of the master type site and its stratification of cultures. The correspondences between these sites and their absolute dates when determined can readily be fitted into the general framework of the Historical Culture periods. Both these series of names are necessary to designate artifacts not exactly dated. Thus Ko 55, 59 and 90, found in the culture strata at Hsiao T'un would be designated by reference to the pottery and its stratification as Hsiao T'un II, according to the terminology adopted by Dr. Wu. These Ko have been called in this monograph, Shang II. Dr. Wu, page 42 says, "Hsiao T'un was not inhabited in the Red Pottery period, but only later in the Black Pottery period, after which there was an interval of perhaps not more than a few centuries

before the Saang-Yin people came". This implies that the Black Pottery period is to be dated before Saang I. Dr. Yu's thesis was limited to a discussion of "Prehistoric Pottery in China" as this thesis is restricted to the "Shang Ko". The period of time which the two studies have in common is designated by Dr. Yu as Hsiao T'un II. His table of Correspondences on page 170 is separated into two parts with the sentence "at the sites below this line certain prehistoric wares persisted into historic times". Below this he enters on the first line as contemporary with Hsiao T'un II not only the nearby site of Hou Kang III, but also Sha-Kuo T'un II in South Manchuria, see map facing page 1, site 18; Hsi Yin IV, map, site 9, and Ching-ts'un I, map site 10, in Southern Shansi; and Fan-Shan, map, site 12 on the T'ao River, a southern tributary of the Yellow River in Western Kan Su. The writer has no wish to press these correspondences but merely to point out the possibility that they are correct and to suggest that these culture sites though widely distributed in area are the places to look for Ko, bronze Types III-X and the proto_type I stone sickles and jade Ko, prototype II of the Shang II period. The pottery at Tou Chi T'ai in Western Shensi, site 11, where jade Ko 17 is stated to have been found is placed in the period following Hsiao T'un II.

These 13 pottery periods of Dr. Yu's table (page 170, 7 before and 6 after the move to Yin) do not conflict with the historical culture periods used in this study. Excavated artifacts are best designated by the names of the type site and its stratification of culture layers until they can be given absolute

dates or their correspondences in historical culture periods.

The Ko discussed in this monograph cannot be given any designation based on archaeological culture strata. We are compelled therefore to use historical culture periods which are given below in the suggested chronology and the accepted orthodox dates. The term Hsia is placed at the beginning, for lack of

any better historical name, Culture Periods	Relative Chronology	1979-1986 1979-1986
Hsia(?) (I and II)	2005-1535 B.C.	2205-1767 B.C.
Shang I	1534-1312 B.C.	1766-1388 B.C.
Shang II	1311-1039 B.C.	1387-1123 B.C.
Chou I	1038- 771 B.C.	1122- 771 B.C.
Chou II	770- 482 B.C.	770- 482 B.C.
Chou III	481- 207 B.C.	481- 207 B.C.
Han I	206B.C.-A.D.22	206B.C.-A.D.22
Han II	A.D.23-220	A.D.23-220

A TABLE OF THE SEXAGENARY CYCLE OF DAYS

The sixty days of the sexagenary cycle are: Chia (1), Yi (2), Yin (3), Ping (4), Wu (element) or Mou (an earlier pronunciation--"fourth day") (5), Chi (6), Kan (7), Jen (8), Jen (9), Kwei (10), and

The twelve months are:

Tau (A), Ch'ou (B), Yin (C), Mao (D), Ch'en (E), Ssu (F), u (G), wei (H), Jen (I), Ku (J), Kwei (K), and (L).

The method of substitution is indicated in the following table by applying the same numeral and Roman letters in proper sequence.

	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>
1A	KIA	YIA	YIN	YIA	YIA
2	YI	YIN	YIN	YIN	YIN
3	YIN	YIN	YIN	YIN	YIN
4D	YIN	YIN	YIN	YIN	YIN
5E	YIN	YIN	YIN	YIN	YIN
6F	YIN	YIN	YIN	YIN	YIN
7G	YIN	YIN	YIN	YIN	YIN
8H	YIN	YIN	YIN	YIN	YIN
9I	YIN	YIN	YIN	YIN	YIN
10J	YIN	YIN	YIN	YIN	YIN

The following are the Chinese syllables which are written on the circular chart of the sexagenary cycle--one old boys when they began to learn Chinese numbers. The characters are usually written in two parts of thirty characters each.

First part.

1 Chia wei	11 Chia wei	21 Chia wei
2 Yi wei	12 Yi wei	22 Yi wei
3 Yin wei	13 Yin wei	23 Yin wei
4 Ping wei	14 Ping wei	24 Ping wei
5 Wu wei	15 Wu wei	25 Wu wei
6 Chi wei	16 Chi wei	26 Chi wei
7 Jen wei	17 Jen wei	27 Jen wei
8 Kwei wei	18 Kwei wei	28 Kwei wei
9 Jen wei	19 Jen wei	29 Jen wei
10 Kwei wei	20 Kwei wei	30 Kwei wei

Second part

31 Chia wei	41 Chia wei	51 Chia wei
32 Yi wei	42 Yi wei	52 Yi wei
33 Ping wei	43 Ping wei	53 Ping wei
34 Yin wei	44 Yin wei	54 Yin wei
35 Wu wei	45 Wu wei	55 Wu wei
36 Chi wei	46 Chi wei	56 Chi wei
37 Jen wei	47 Jen wei	57 Jen wei
38 Chia wei	48 Chia wei	58 Chia wei
39 Jen wei	49 Jen wei	59 Jen wei
40 Kwei wei	50 Kwei wei	60 Kwei wei

School-boys' copy tables were often written on unincised spaces of used oracle bones. The graphs were written one below the other in six perpendicular columns. There was very little other writing on oracle bones not strictly classified "divination sentences", pu tzu. These tables were sometimes written upside down when compared with the original "divination sentences", pu tzu, written on the same bone by the diviner scribe. Compared with the well formed graphs these tables were crassly written, naturally enough in view of the youth of the writers. The Ritual, Li Chi, says "At nine years teach the (boys) to count days, chia hien chia chin chu jia. The last commentator, Cheng 'sün, says "days" are the six chia tables chi, hia chia jen. Chia was the simplest bone graph. It was written as an upright cross. Each of the six columns of the table of nine days began with a chia graph. At ten years (boys) are to learn to write records, chia hien chia chu chia"¹.

1. Logan, Li Chi, vol. 1, p. 175.

present list has 31 names down to Shou (Shou or Ti) Hsin (31), the last king of Shang. The bone inscriptions record Ming Ta King (2) in the same manner as other kings. They give no indication that he did not reign as Wencius and the Shih Chi History state. The number given to each king in this list after Ta King is one greater than that given in other lists, e.g. P'ien Keng is here listed as the 30th King of the Shang rather than the 19th King Ta Yi. Su Keng (32) successor of Shou Hsin (31) is placed last in the list. He was a descendant of the Shang ancestors who were the last to rule in the last days of the dynasty. No doubt there were other kings who reigned in his generation (XXXIV).

Beginning with the first King, the grandfather of Ta Yi, the names of the queens of each King in the direct line of succession were recorded on the bones. The names of other Kings who reigned themselves but did not have sons who reigned were not recorded. This information is not found in the later literary records. When a royal son presided at the ancestral rites he always mentioned the queens from whom he was descended along with the kings. When more than one queen was recorded at least one son of each ascended the throne in the next generation. Thus in generation III Chu Yi (14) had two queens, Yi Chia and Yi Keng, and in generation IV there were two brother kings, Tsu Hsin (15) and Hsien, (no) Chia (16). Tsu Hsin (15) had two queens, Yi Chia and Yi Keng, and there were two brother kings in generation IV, Tsu King (17), and Tsu Keng (18). Tsu King (17) had two queens Yi Chi and Yi Kuei and there were four kings and two other brothers in generation (XVI), Hsiang, (Kang) Chia (19), P'ien Keng (20), Heiao Hsin (21), Father Chi (21A), Father Kuei (21B), and Hsiao Yi (22). Wu King had three queens,

Pi Hsia, Pi Kuei, Pi Wu, and there were three brothers in the next generation: I-shu Chi (24A) I-shu Keng (24) and I-shu Chia (25). This confirms the record of the generations in the brother or son relationship of the successive kings.

An ancestral title of (Pi) Elder Brother Chia (26) is not recorded on the bones. He was simply called Elder Brother in the same manner as the persons recorded on 231, 257, 24, 251, 287, who did not have titles but were in the royal succession. If the number of young kings was 30 and not 31 then the evidence of the bones points to the father of (Pi) Elder Brother Chia (26) and not to Chia (25).

The present table has some new additions to the writer's table of 1937 suggested by this study of the ho. Elder Chia (24A) (Ch'ia Chia I.1.22.1-14 3.2.2, Elder Brother Chia I) and Elder Kuei were manifestly brothers. They share inscriptions which together are written on a group of 119, 21, 22-26, 202-207, 190, et al. They belong to the generation of I-shu Chi (20) also Chia (21) and Chia Chia Chia Chia (22) (I.1).

Elder Brother Chia (26) was elder brother of (Pi) Chia (25) (Ch'ia Chia I.1.22.2; 3.2.3, also as Ch'ia Chia I.1.22.14 3.2.2). Elder brother (25) was called Ch'ia Chia (number) but by later generations, was elder brother of 23A, called (25) and not elder brother Ch'ia Chia (I.1.1) (Ch'ia Chia I.1.1 3.2.2, Ch'ia Chia 237).

Elder Brother Chia (26) was elder brother of (Pi) Elder Brother Chia (25) and Ch'ia Chia (27), not of Ch'ia Chia as Kuo Mo-jo suggested in his note on Ch'ia Chia, 279. The script is somewhat earlier than Mr. Kuo judged. This is proved by the set of bronze vessels belonging to "Little Minister Man With

elaborate hair dressing kneeling before a liquor jar on an alcohol stove," whose name is found on some inscriptions (Sh'ien pien 5.30.1; Shan-shan 1.25.16). Also 37 vessels recorded by Jung Heng, Shen-shan-shan, 1339, Supplement, Vol. 1, 1. 13 are either Hsiang-shan 13. 6.3 and 4; Hsiang-shan, shu-shan 5.17.1; 7.3.8; and Hsiang-shan, shu-shan 5.11.3. Hsiang-shan, shu-shan, shu-shan (114) shu-shan (115) shu-shan (116) shu-shan (117) and shu-shan (118).

This present table has been used to obtain the dates of sets of bronze ritual vessels from inscriptions and other inscriptions on them. To the left of them is recorded the absolute date which can be determined by the Shu-shan chronology may be exact to within a generation. The generations given in this table is a conservative estimate. It is based on a multitude of other inscriptions and is not final. The date of the list is derived from the Shu-shan 13. 6.3 and 4. The date in the list was determined from the inscriptions of Father Kuei (114) in inscriptions on sets of bronze ritual vessels. The date of Father Kuei (114) from the inscriptions may be accounted for on the supposition that he was a son of King Wen (10). It is stated in the Shu-shan 13. 6.3 and 4 that King Wen (10) was son of Chiang (10) Hsiang-shan (11), the son of Shu-shan (11). Father Kuei would then be related to the direct line of succession only through his great grandfather, Tsu Yi (14). If this were so, Kuei might well have been omitted by the reigning sovereign to the ancestral ceremonies recorded on the oracle bones. But because his father was King Wen (10), was a king his name would have been inscribed by

his sons on their bronze ritual vessels. Their vessels would also have been inscribed with the names of deceased kings of the direct line of succession. In this manner lists of bronze ritual vessels would include the names of the sons of King [18] while kings of the direct line might omit their names from the ceremonies as persons who could no longer claim to have the right to their descendants.

A Table of the Generations of the Rulers of the Shang dynasty beginning with Shang Chia.

<u>Generation</u>	<u>Elder brothers</u>	<u>Direct Line</u>	<u>Queen</u>	<u>Younger brothers</u>
I		Shang Chia		
II		Pao Yi		
III		Pao Ling		
IV		Pao Ling		
V		Shih (Chu) Jen	Ti Feng	
VI		Shih (Chu) Kuei	Ti Chia	
VII		Yang'en Ta (Yi) Yi (1)	Ti Feng	
VIII		Ta Chia (2)	Ti Chia	
VIII				Tu (Wai) Feng (3)
VIII				Tan (Chung Jen) (4)
IX		Ta Chia (5)	Ti Chia	
X	Hsiao (6) Feng (8)			
X		Ta Kung (7)	Ti Jen	
XI	Hsiao Chia (8)			
XI	Chung (Yang) Chi (9)			
XI		Ta Wu (10)	Ti Jen	
XII		Chung Ting (11)	Ti Kuei	
XII				Tu (Wai) Jen (12)
XII				Shan (Ho T'an) Chia (13)
XIII		Tsu Yi (14)	Ti Chi Ti Kung	
XIV		Tsu Hsin (15)	Ti Chia Ti Kung	
XIV				Chiang (wo) Chia (16)



D.
THE DATES OF THE DIVINERS ON THE
BONE INSCRIPTIONS FROM THE WASTE OF YIN

The bone inscriptions, as noted in the preface, provide evidence for dating the inscribed bronze Yo. These bone inscriptions have been divided by scholars into five script periods on the twofold basis of their developing graph forms and of their relation to the genealogy of the Shang Kings. In bone inscriptions concerning ancestral ceremonies and in subsequent history each Shang King was distinguished by a temple title and name day, possibly his birthday, one of the cycles of ten days. The Temple titles used were: "great" ta, "middle" chung, "little" hsiao, "Ancestor" tsu, "warrior" chi, "peaceful" k'ang, and others such as "lover" pan, for King P'an Keng¹ who moved the capital to the waste of Yin. When a

1. The word "love" pan, is now pronounced unaspirated, the later orthodox pan of the King's name is now pronounced aspirated.

diviner inscribed for a King a divination bone about ancestral ceremonies to be conducted in honour of the King's "Father" fu, "Mother" mu or "Elder brother" hsiang, he wrote these titles of blood relationship combined with the name day rather than the permanent temple titles used in succeeding generations. In this manner the names of the diviners themselves, which are an integral part of most bone inscriptions, are closely linked with the distinctive bone script of a dated period. The names of persons which occur both on Shang Yo and on bone inscriptions are thus more precisely dated by the names and script of the diviners who inscribed the bones.

The script periods are listed in English in the Illustrated Catalogue of Chinese Government Exhibits for the International

Exhibition of Chinese Art in London, 1936, Vol. 4, p. 128. This list gives only the names of the reigns and use the orthodox literary names of the kings. In conformity with the usage in this monograph, the names of kings are given in the table below as they were originally inscribed on the oracle bones and dates have been added from the chronological scheme proposed by the writer. A detailed discussion of the names of diviners Cheng jen and the evidence for their dates is given by Mr. Tung Tso-pin in his article entitled "Criteria that may be used for a more exact dating of the Oracle Bone Records" in Studies presented to Ts'ai Yuan-p'ei, Peiping, 1935, pages 323-424 (called hereafter Tung Criteria). On page 373 Mr. Tung lists the diviners cheng jen, who were also the historians shih kuan, under their respective script periods. The names in the table below are given in Mr. Tung's order; his article may be consulted for the Chinese characters. In this monograph reference will be made by giving the Chinese name of the diviner followed by the Roman numeral of the period and the Arabic numeral of the sequence. This Nan I.1 means that Nan is the diviner listed first in the first script period. Where question marks are placed in the list the present writer does not hazard a sound equivalent; the graphs are definite and are not in question.

Table of the bone-script periods and of the Diviners.

Script period I	Before the reign of Wu Ting, 1311-1256 B.C.
	Reign of Wu Ting, 1255-1197 B.C.
	Diviners: 1, Nan; 2, Huan; 3, Yung; 4, Pin;
	5, Cheng; 6, Wei; 7, Chung; 8 (?); 9 (?);
	10 (?); 11, Fu; 12, Shih.

- Script period II Reign of Tsu Keng 1196-1190 B.C. and of Tsu Chia 1189-1187 B.C.
Diviners: 1, Ta; 2, Lü; 3, Chi; 4, Hsing; 5, K'ou; 6, Hsuing; 7, Ch'u.
- Script period III Reign of (Lin) Hsia, 1156-1151 B.C. and of Tsu Ting, 1150-1145 B.C.
Diviners: 1, Yi; 2 (?); 3 (?); 4, Chu; 5, Ti; 6, P'eng; 7, Shen; 8, K'ou (the same as II.3); 9, Lu (the same as II.2)
- Script period IV Reign of Wu Tsu Yi, 1142-1139 B.C. and of Wen Tsu Ting, 1138-1121 B.C.
Diviners: According to Mr. Tung the fourth script period did not record the names of diviners on the inscriptions.
- Script period V Reign of Yi¹, 1125-1091 B.C. and of Hsin², 1090-1039 B.C.

1. This king was not given a temple title on some inscriptions because the Shang dynasty perished in the reign of his son who honoured him with the filial title father, fu. In literary historical sources he is called Emperor Yi, Ti Yi, a title probably given after the first emperor Chia Hung Ti assumed this Shang dynasty name for god in 231 B.C. Certain inscriptions on bronze ritual vessels make it possible that Wen Yi was the temple name of this king. See Min Yi-shih (James L. Menzies) Chia Ku Wen Chiu (Oracle Bone studies) Caeeloo University, Tsinan, 1935, pages 123 and 125.
2. He is simply called "King" on oracle bone inscriptions written during his reign. Chou dynasty literary sources call him Chou Hsin. This is a derogatory name. Other literary sources call him Shou Hsin. This is possibly his temple name. The graph Shou means "to receive", as it were the kingdom. Later when Shang dynasty genealogies were compiled for the History, Shih Chi he was also called Emperor *Hsin* Ti Hsin.

Diviners: 1, Huang; 2, Yung (graph different from Yung I.3).

In the detailed study of the dates of certain ko in the catalogue above, some few variant opinions have been stated. The present writer would place some diviners and their script in the period 1311-1256 B.C. and would identify the Father Line sometimes mentioned in these inscriptions with King Tsu Ling, father of King of Chiang (Yang) Chia; P'ao Wen; Chia Chia; and Chia Si. The large, vigorous script which has no diviners' names but writes the graph for king, wang, in its archaic form without a stroke on top, is taken to be the reign of King Tsu Ling, 1192-1190 B.C. Father Line of these inscriptions would then be King Tsu Ling and not P'ao Kou Ling as proposed by Mr. Tung. In the writer's opinion, it was in the reign of Tsu Chia that the script of the graph king, wang, was altered to its later form with a stroke on top. This is one of the most characteristic features of the script style of Period III and thereafter it occurs for the graph "king" in most bone inscriptions. Some of the script included by Mr. Tung in Period V in the writer's opinion belongs to Period IV, for the intrusion of an archaistic reversion to earlier script forms between Period III and Period V is unnatural and lacks evidence. Oracle bone study Chia Lu hseh is yet in its infancy. Mr. Tung's article Criteria is foundation work well documented. More will be built upon it in the future. It has already contributed much to the more precise dating of some ko in this monograph, the names of whose owners have been found inscribed in the Oracle bone records of the Shang dynasty.

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Material unearthed before 1910

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<u>Chih-Yü:</u>	Ho Guan-ü, <u>T'ien Yün Is'ang Yuei</u> <u>Chih Yü</u> , 1915.	40
<u>Sün-Yü:</u>	Ho Guan-ü, <u>T'ien Yün Is'ang Yuei</u> <u>Sün Yü</u> , Shanghai, 1915.	318
<u>Chieh-Yü:</u>	Ho Guan-ü, <u>T'ien Yün Is'ang Yuei</u> <u>Chieh Yü</u> , Shanghai, 1915.	650
<u>Chaiant:</u>	Edited by Frank C. Jaubert, edited by Roswell S. Witten. <u>The Chaiant</u> <u>Sant Koulin Collection</u> , Shanghai, 1936; numbers consecutively.	1047
<u>Bowen:</u>	James C. Bowen (1891-1919), <u>Excavations at Hsin Shih</u> , <u>Chih Yü</u> , Hsin, 1919; numbers consecutively.	71
<u>Seven:</u>	Edited by Frank C. Jaubert, edited by Roswell S. Witten, <u>Seven</u> <u>Collections of Inscribed Oracle</u> <u>Bones</u> , New York, 1933 (less Bowen collection). Each collection is numbered separately, preceded by key letters:	446

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"transcripts" signifies "transcripts of the inscription in modern characters";

"hand copies" means "hand-drawn facsimiles of the inscription";

"drawings" and "photographs" refer only to objects.

The word "only" does not exclude a transcript in modern characters, but indicates, that, with the exception of the object named, there is no drawing or photograph of it.

<u>Abbreviation</u>	<u>Title and title of record</u>
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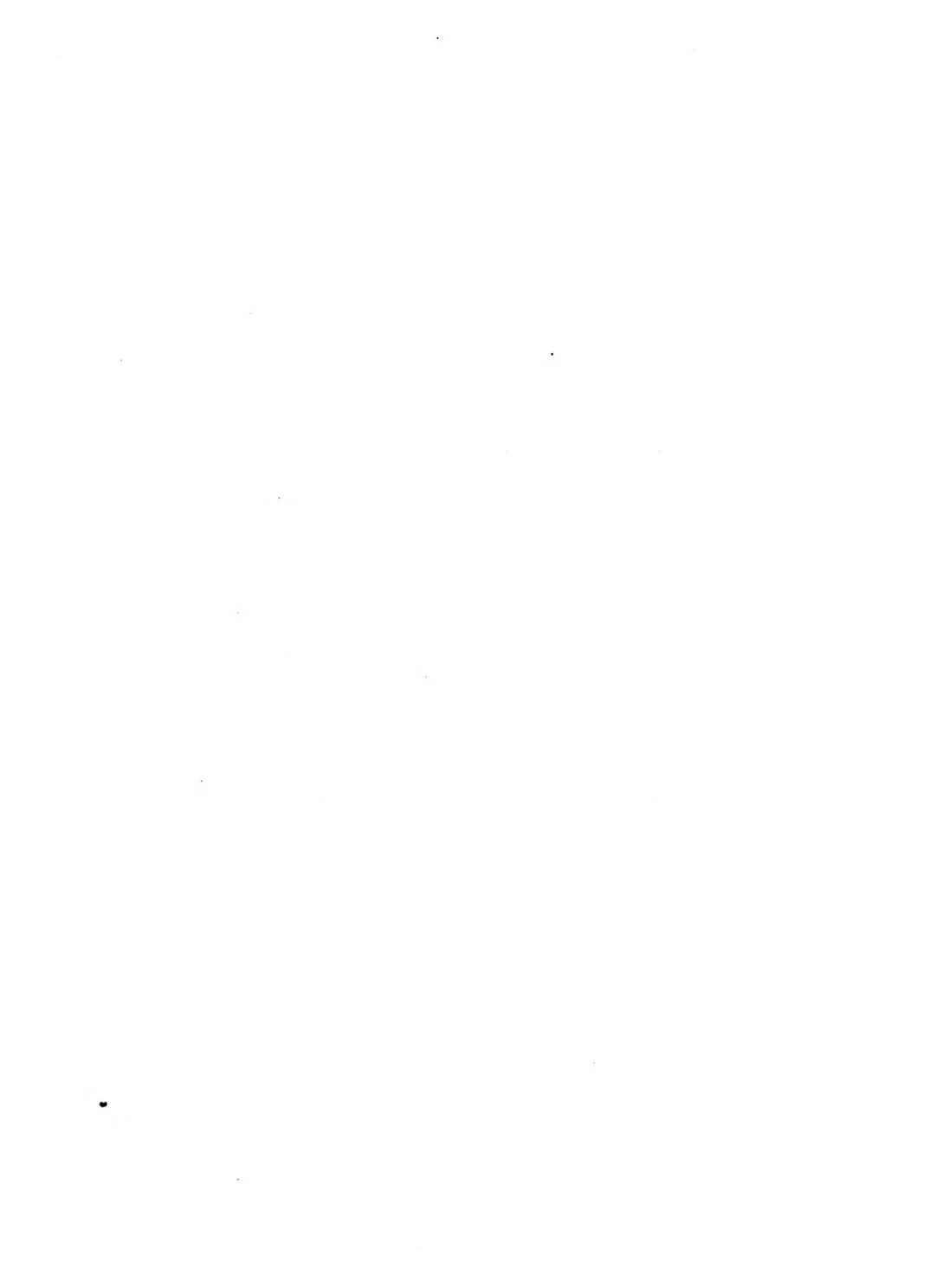
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c. Slag from smelting copper ore.

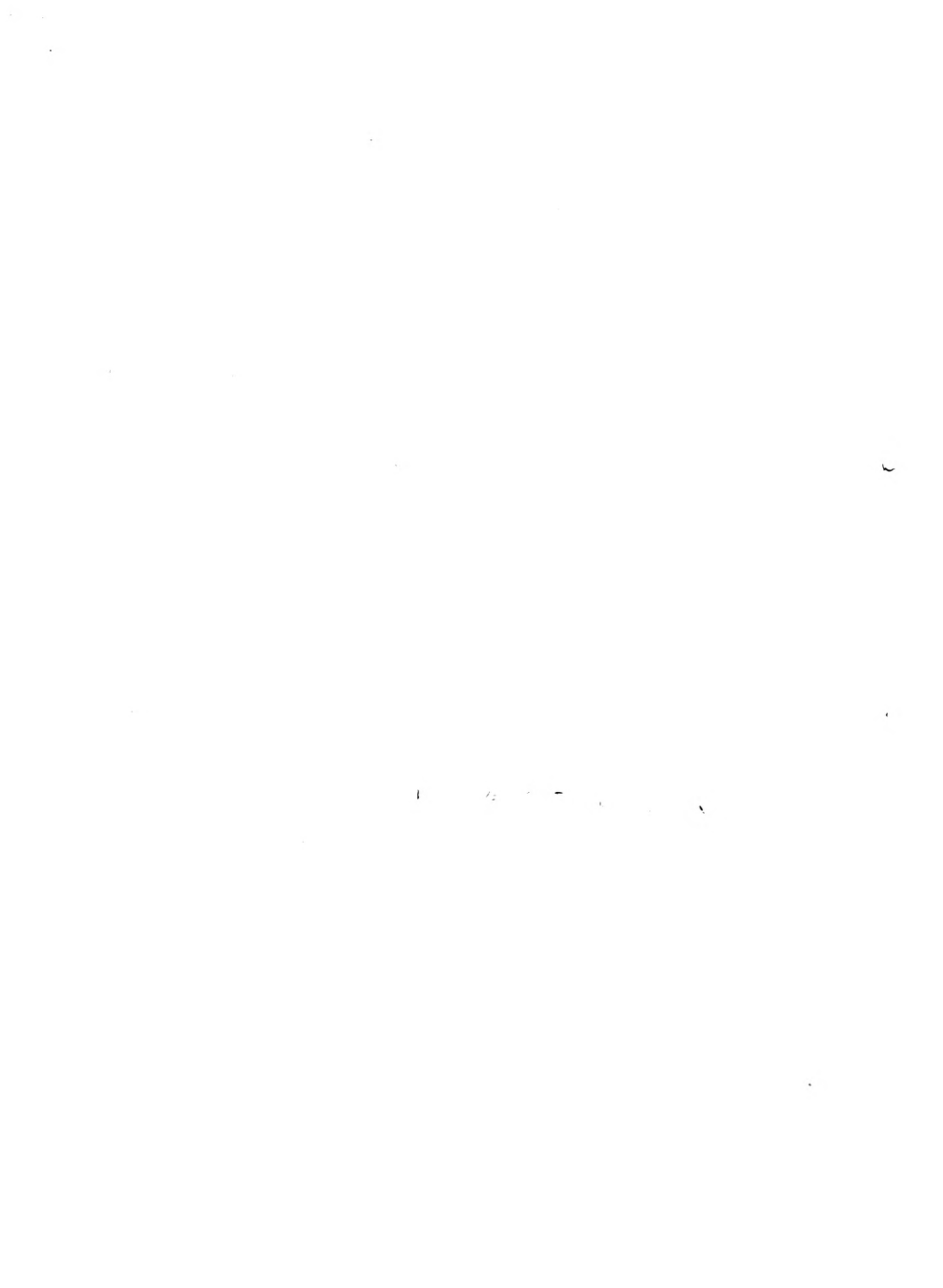
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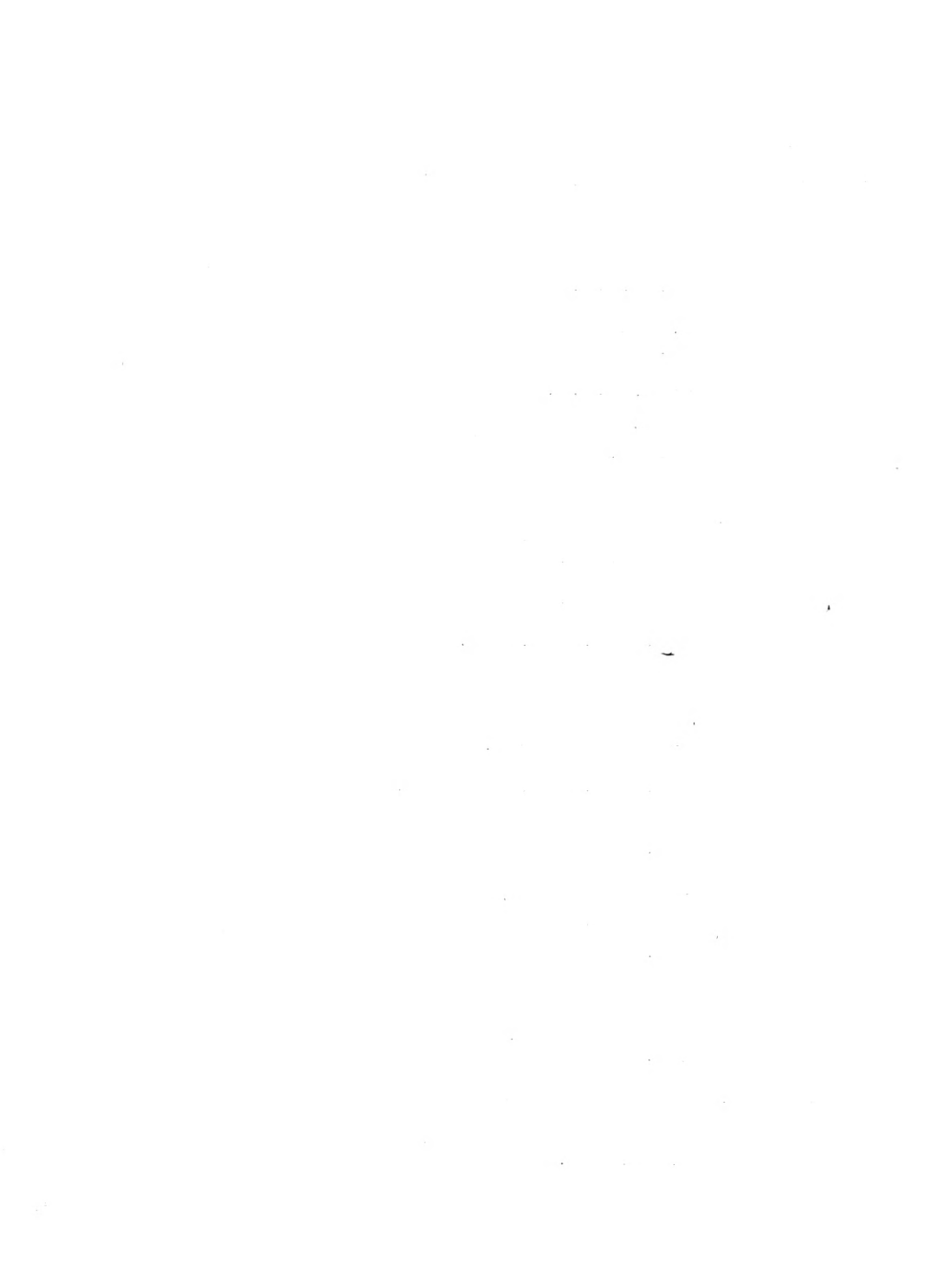
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52.

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The Tsun Ku Chai collection:
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The Chu An collection:
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The Shuang Chien Yi collection:
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The Shan Chai collection:
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Soochow, Kiangsu, China

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Stockholm, Sweden

The Ostasiatiska Samlingarna (Museum of Far Eastern Antiquities).
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Toronto, Ontario Canada

The James M. Menzies (Ming yi-shih) collection.
125, 177.

The Royal Ontario Museum of Archaeology.

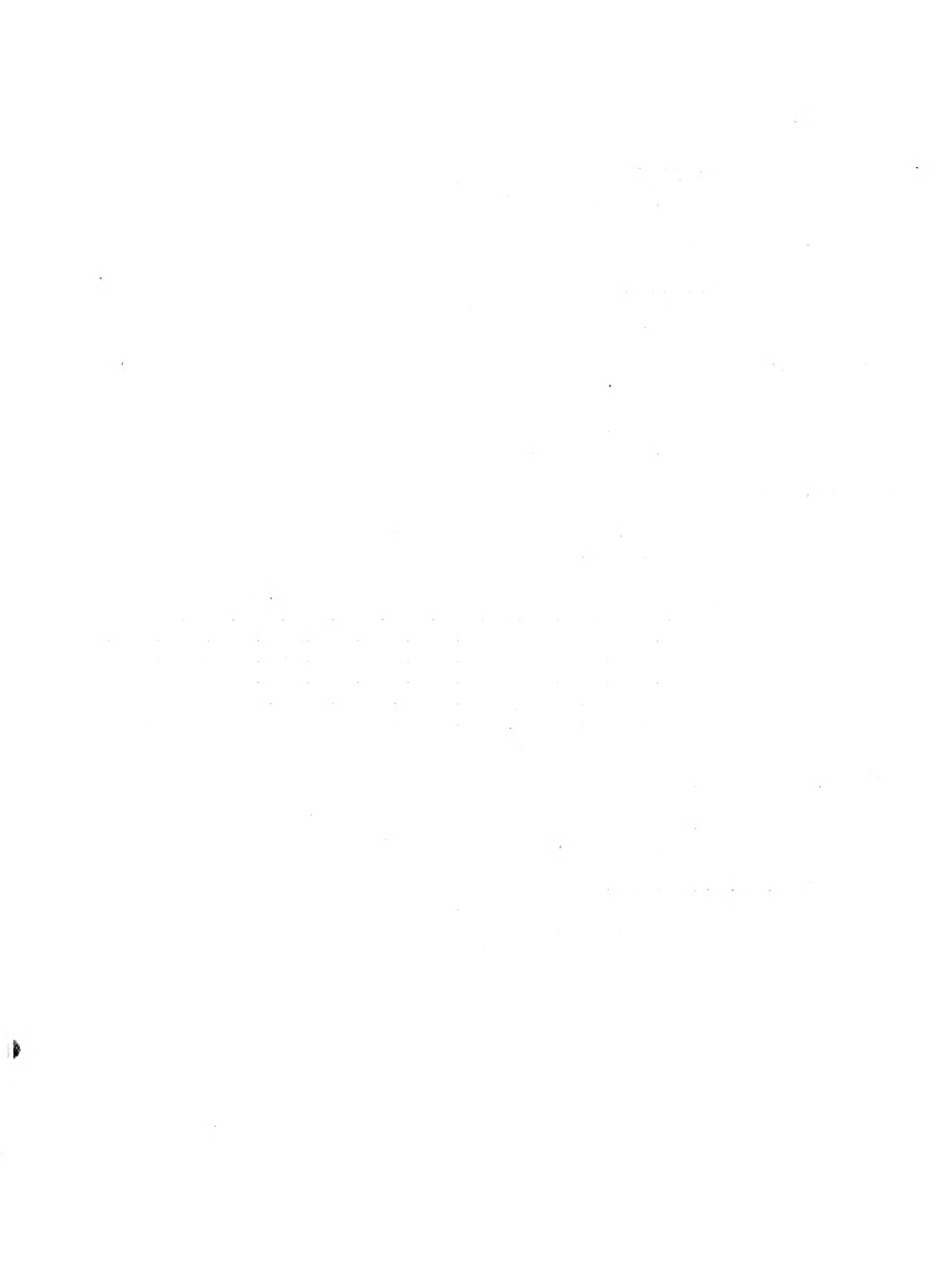
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Tsinan, Shantung, China

The F. S. Drake collection, Cheeloo University.
60, 94, 161.

Washington, D.C., U.S.A.

The Freer Gallery of Art.
5, 17, 132.



<u>R.O.M.A. No.</u>	<u>Ko No.</u>	<u>R.O.M.A. No.</u>	<u>Ko No.</u>
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NB. 1791.....	2	NB. 3364.....	8
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NB. 2964.....	113	NB. 4058.....	126
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NB. 2967.....	53	NB. 5232.....	27
		NB. 5233.....	20



SHANG KO

A study of the characteristic weapon
of the Bronze Age in China in the
period 1311-1039 B.C.

by

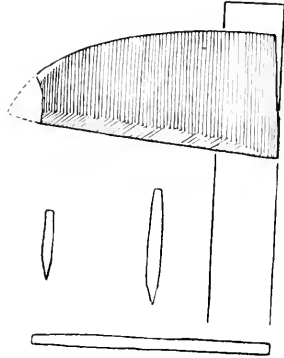
James Mellon Menzies, B.A. Sc.

PLATES

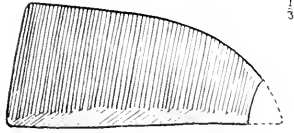
A thesis submitted in conformity with the
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Philosophy in the University of Toronto.

1942

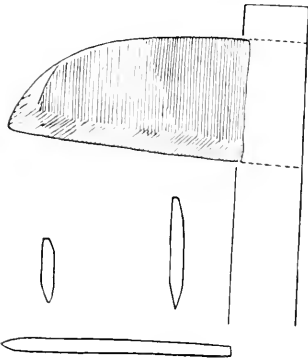
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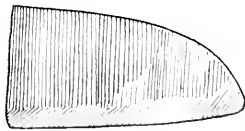
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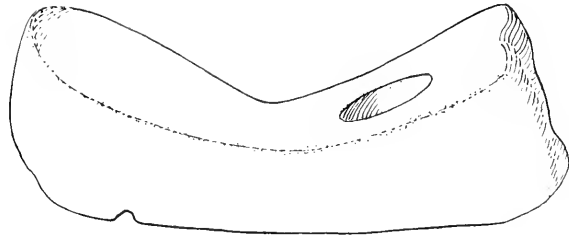
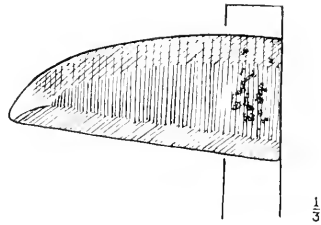


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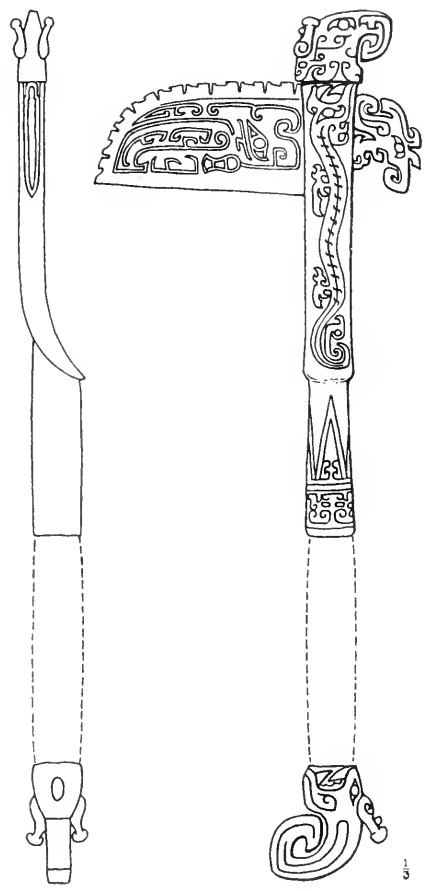
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Type IA



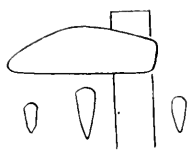
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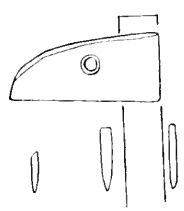
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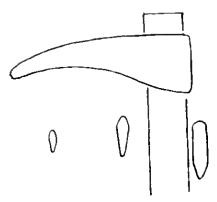
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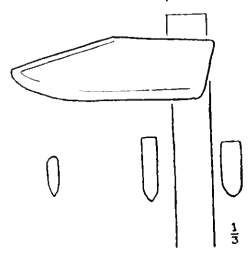
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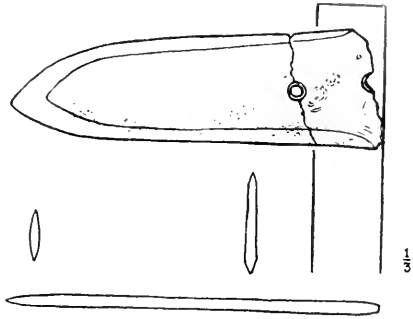
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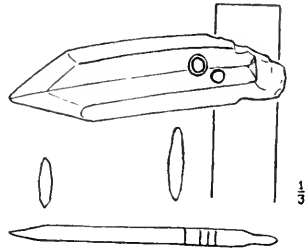
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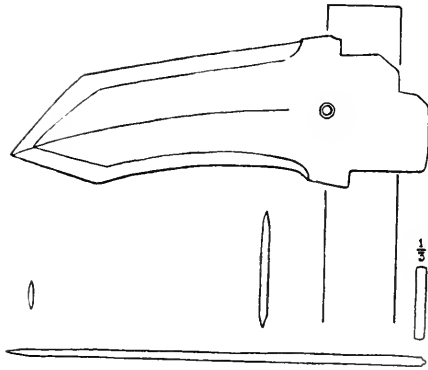
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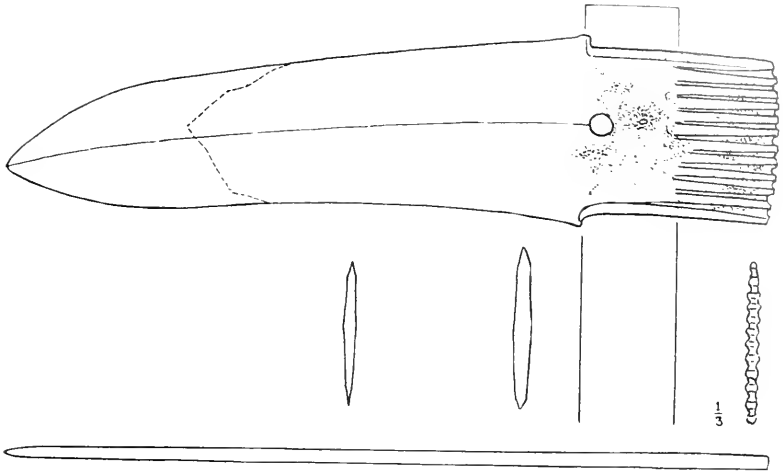


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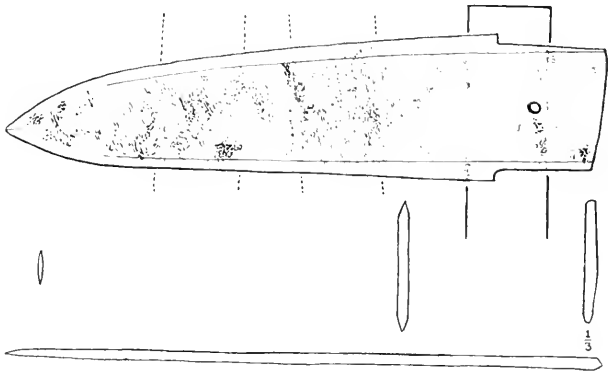


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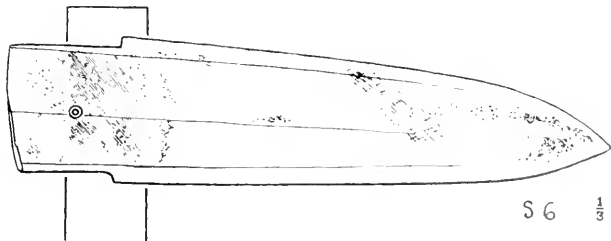
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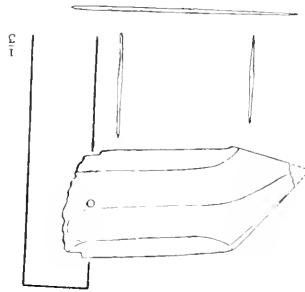
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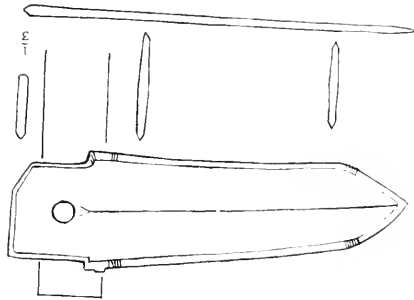
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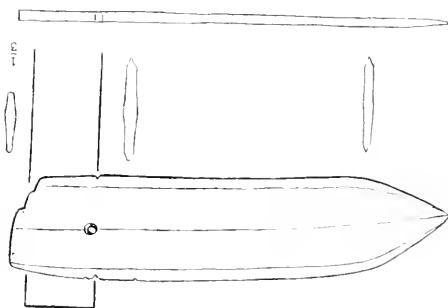
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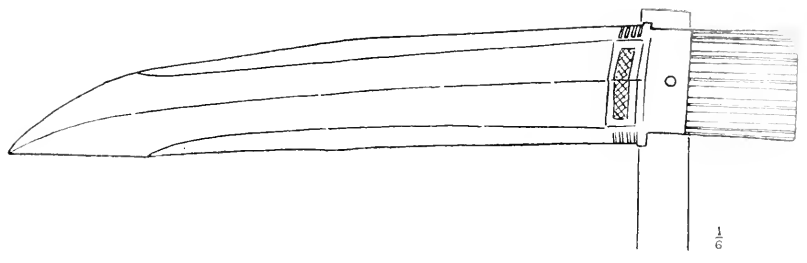


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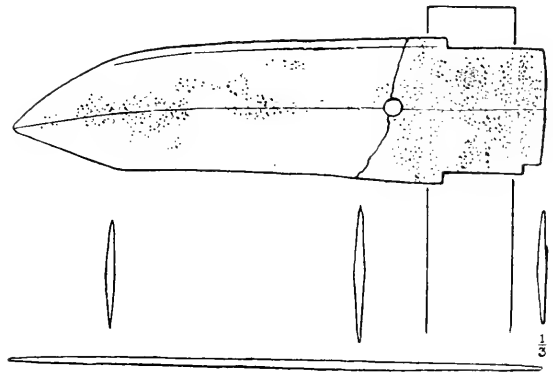


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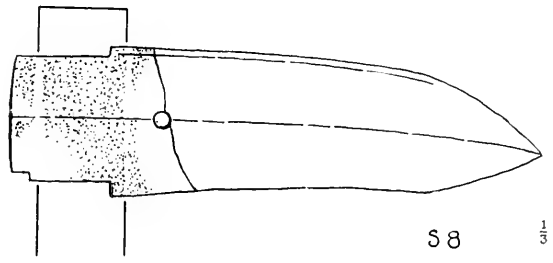
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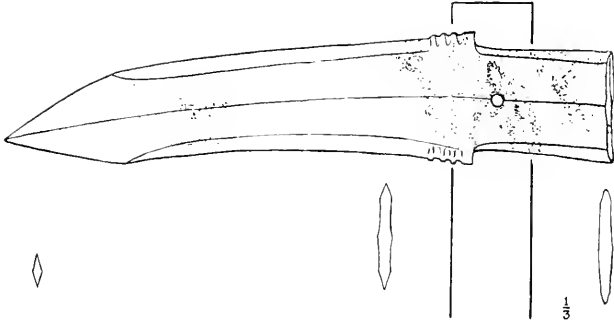


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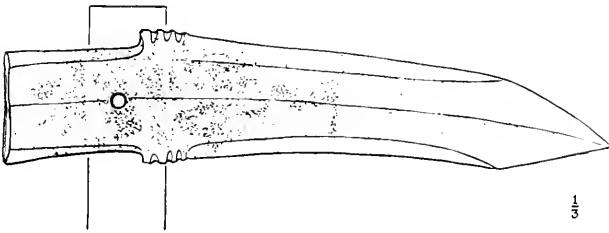
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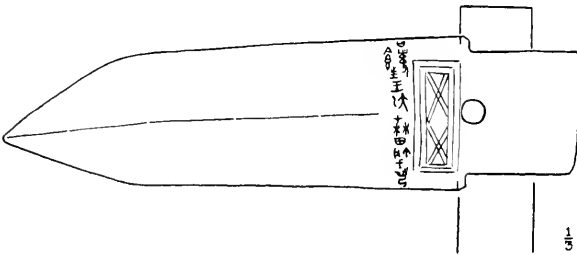
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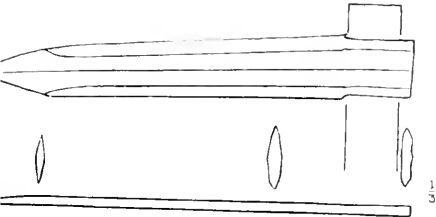
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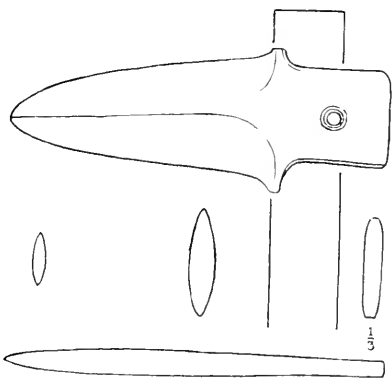
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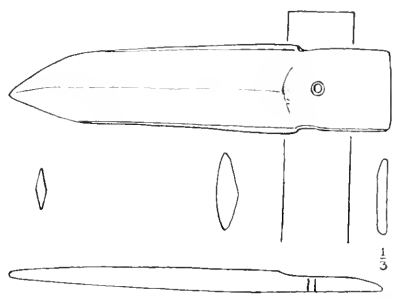


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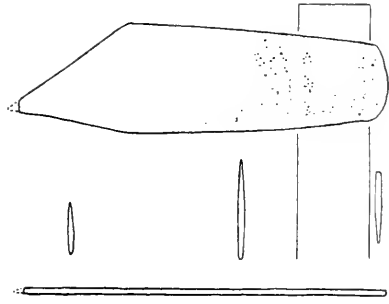
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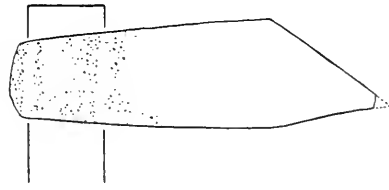
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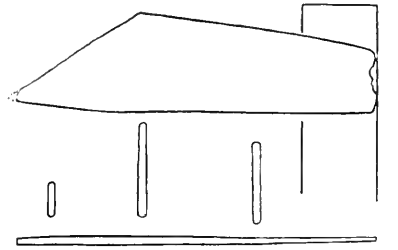
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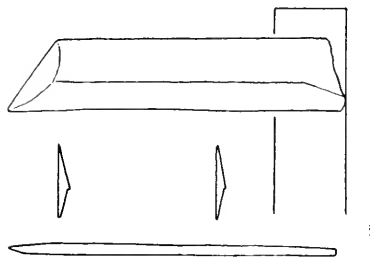
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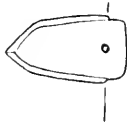
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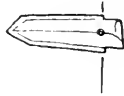
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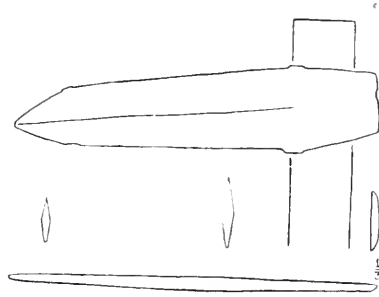


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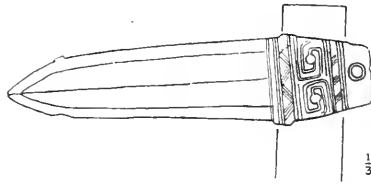
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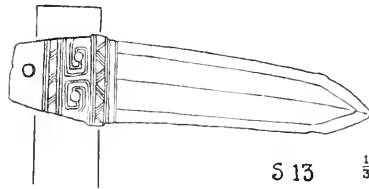
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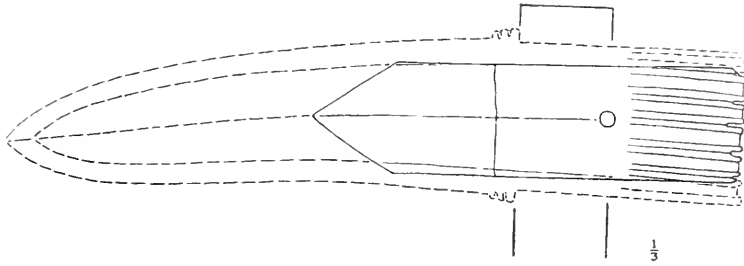


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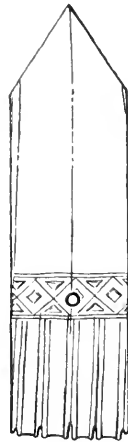


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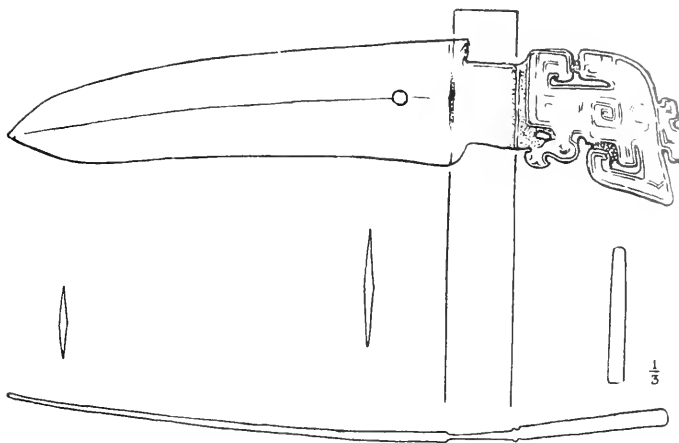


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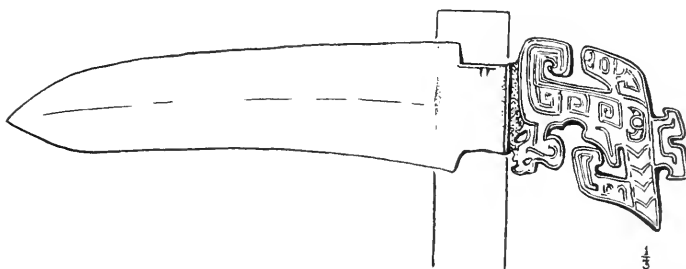


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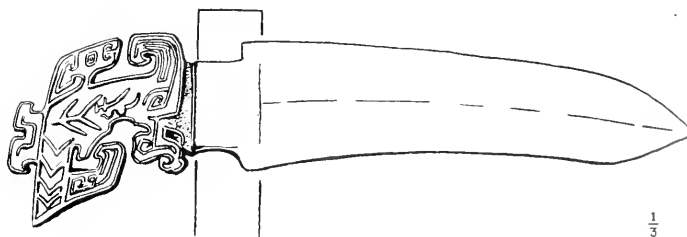
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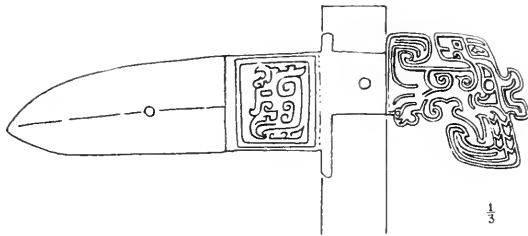


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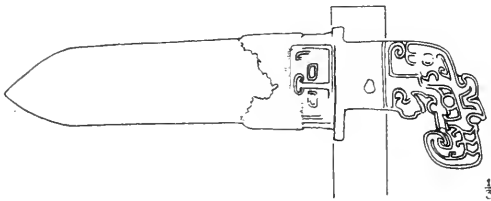


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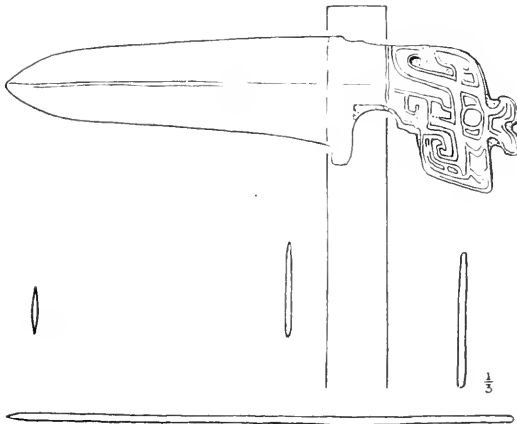
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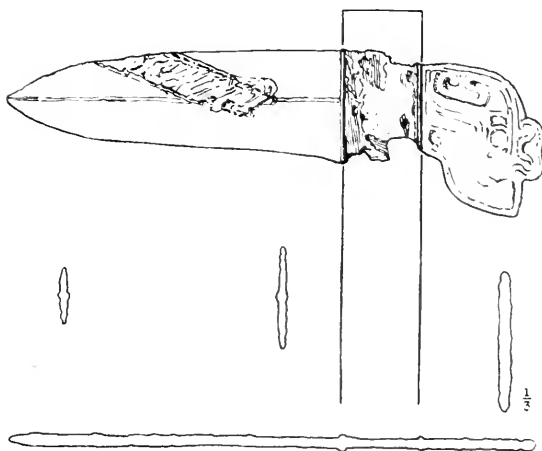
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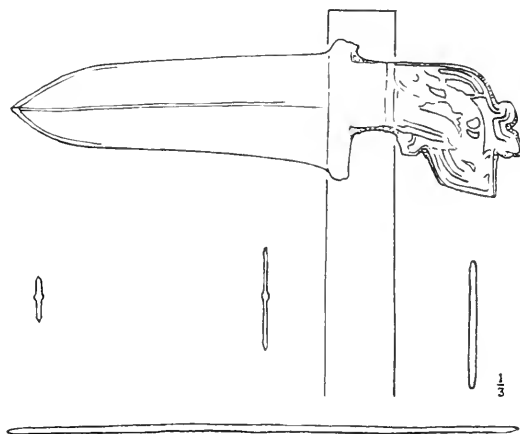
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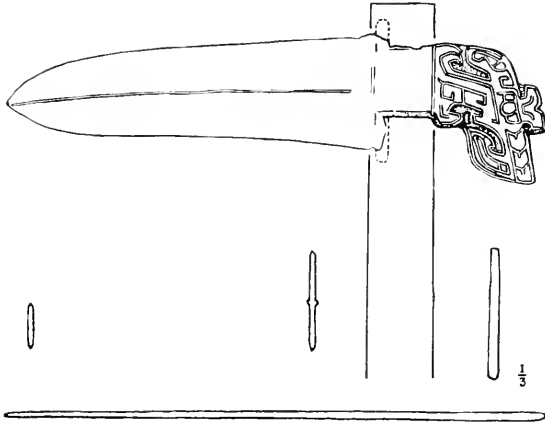
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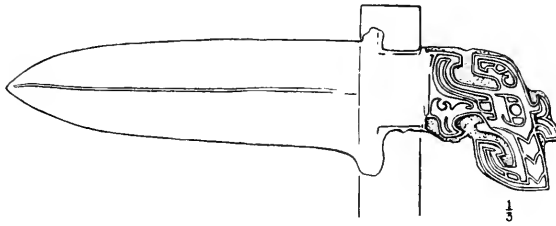
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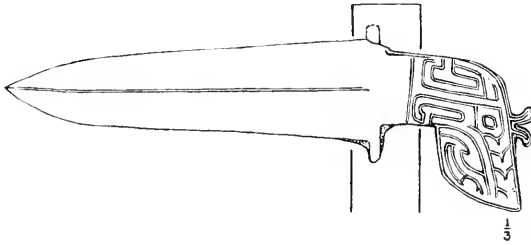
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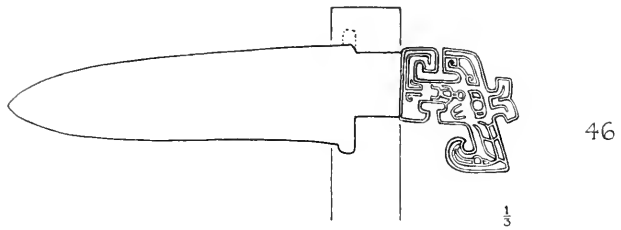
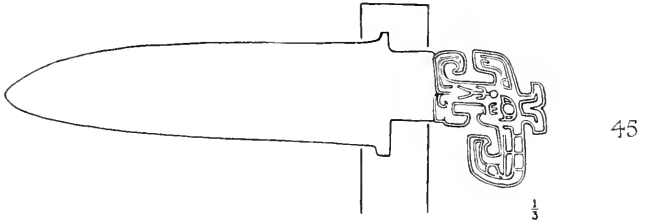
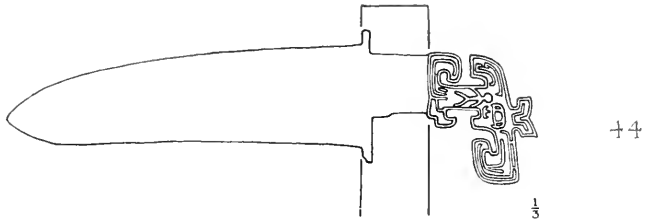


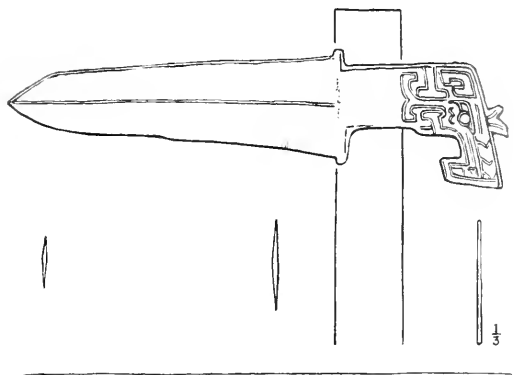
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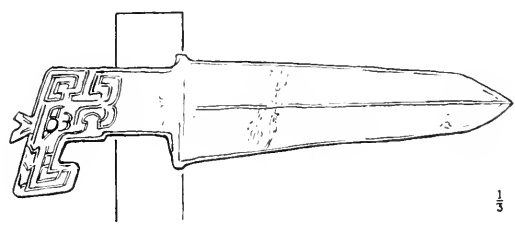
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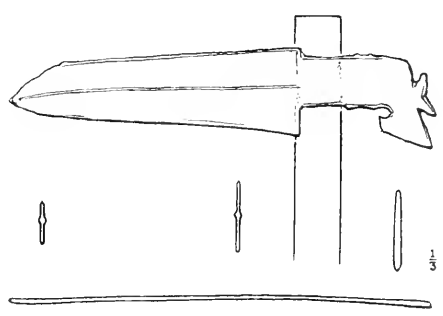




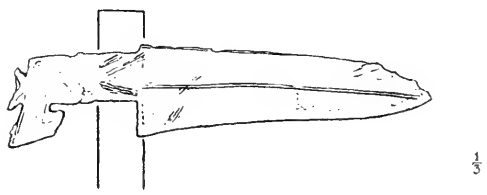
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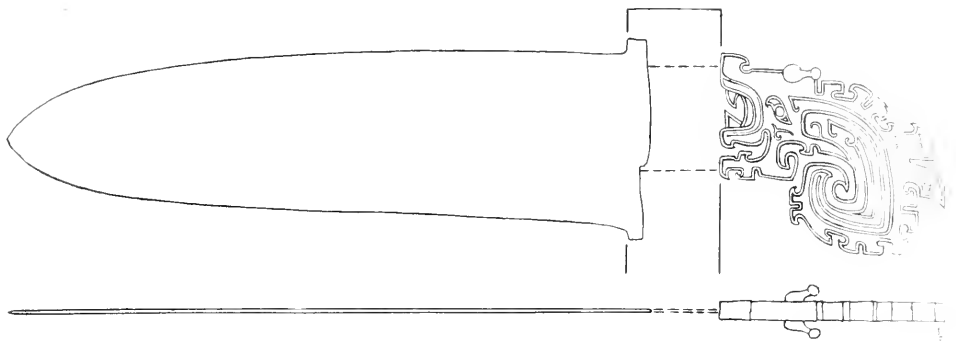
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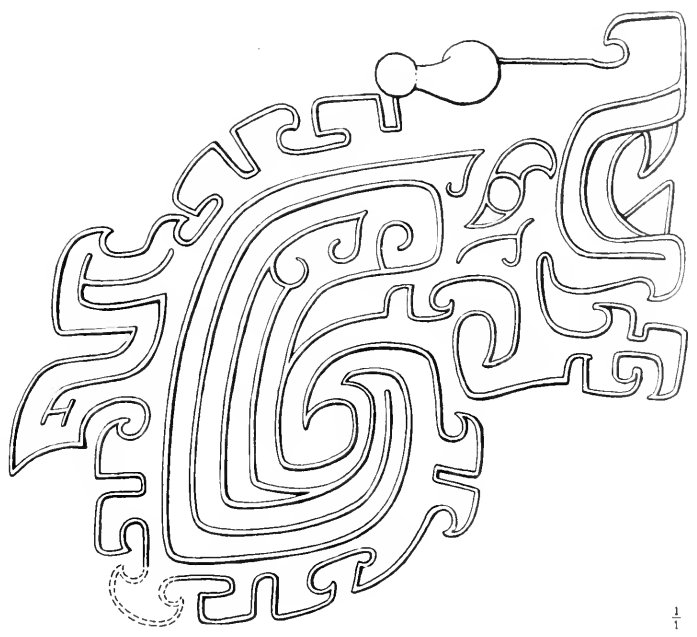
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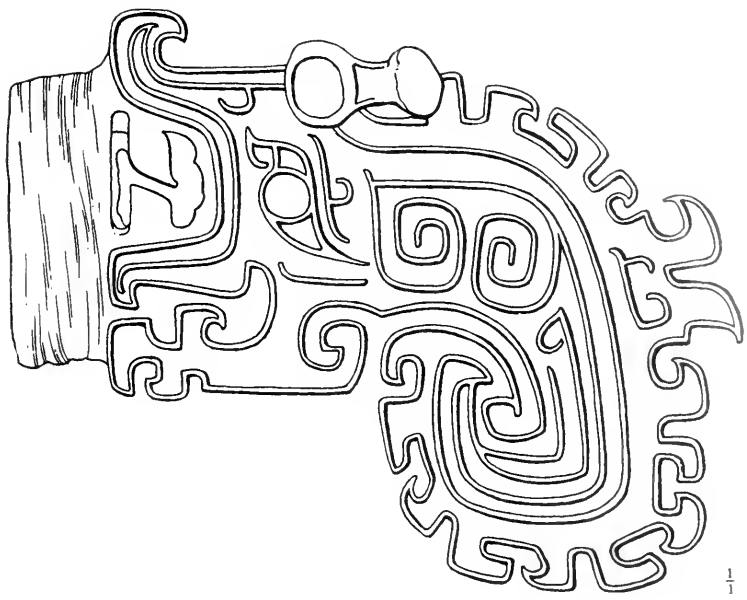


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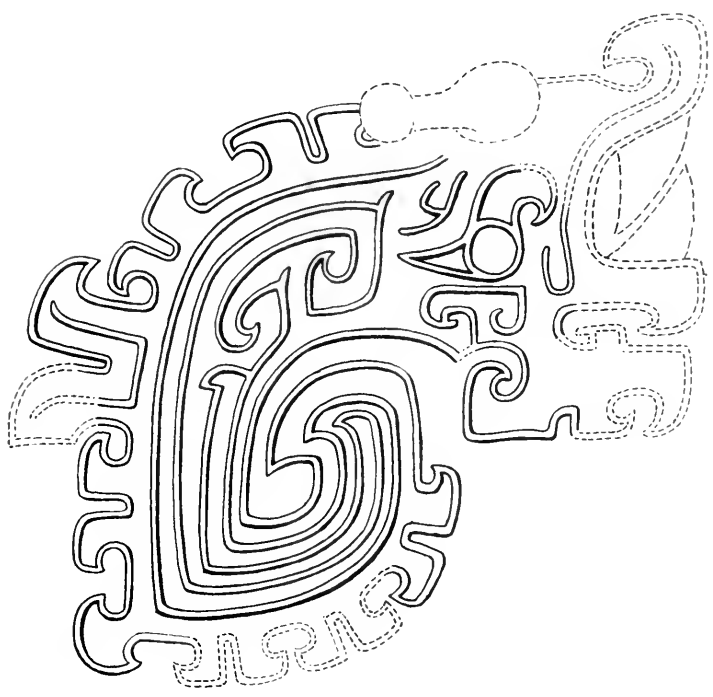
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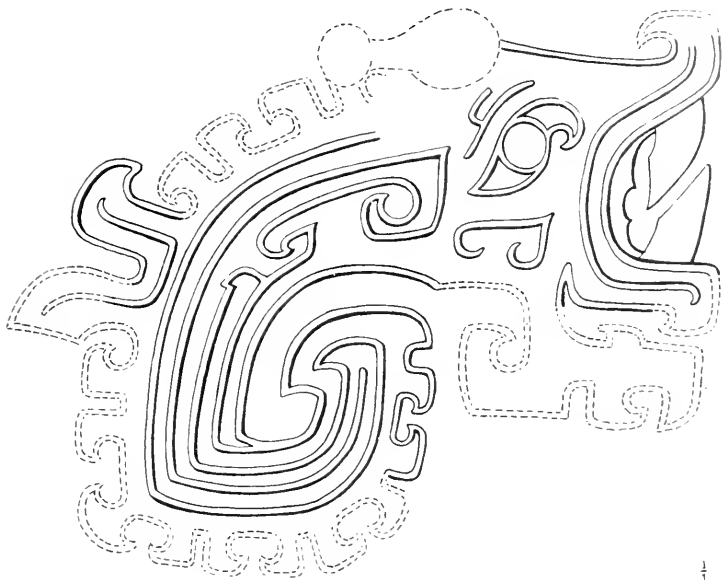


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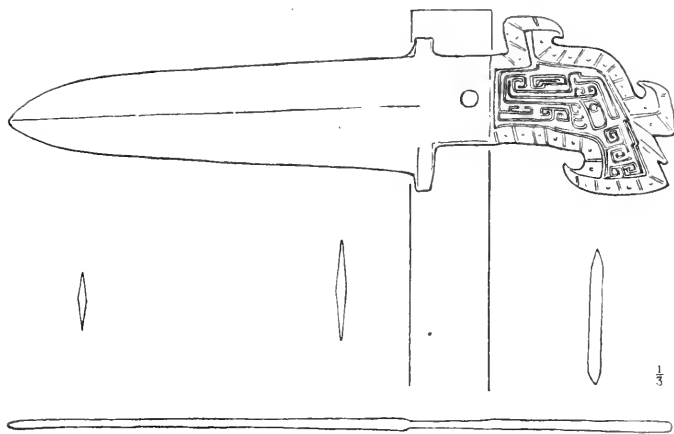
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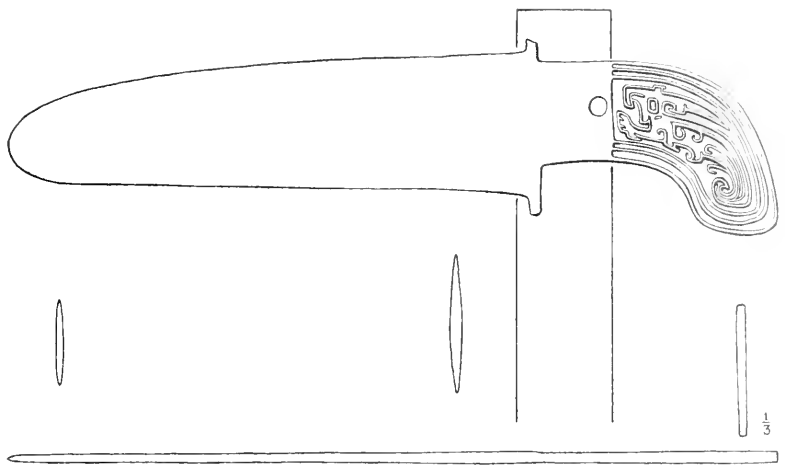


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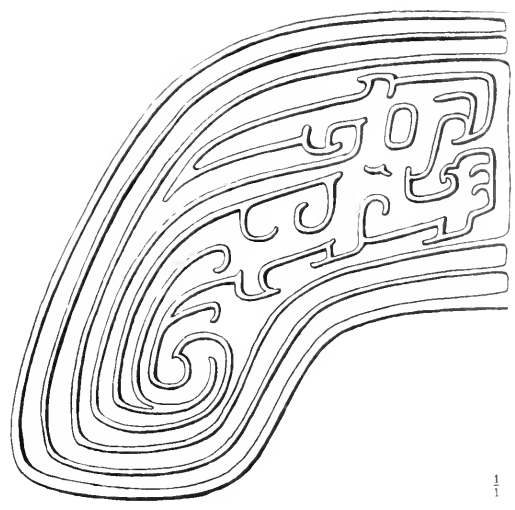


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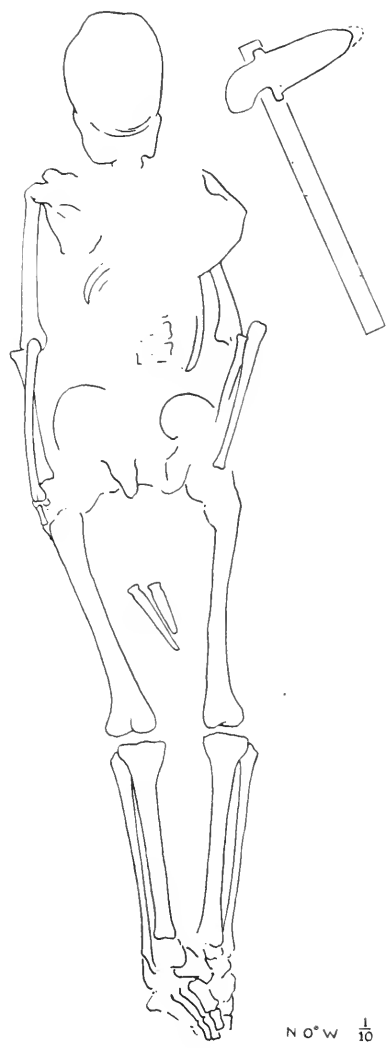
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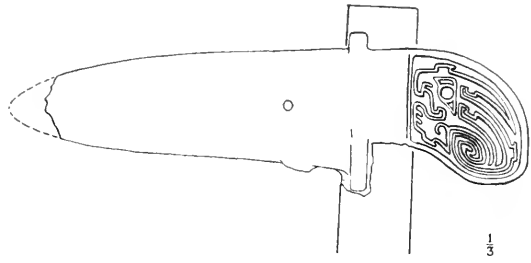
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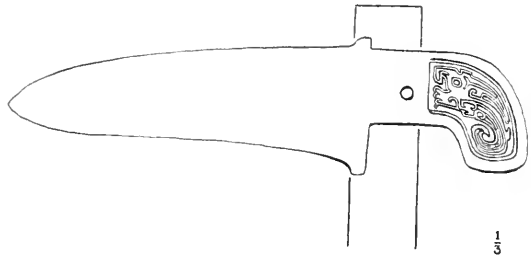


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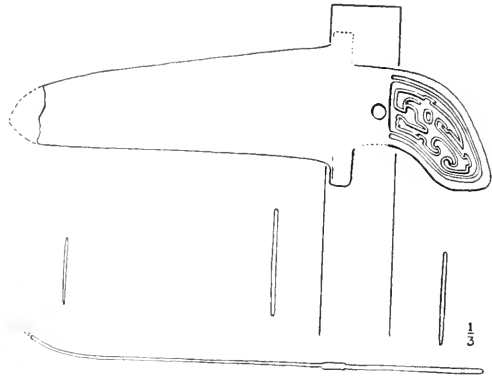
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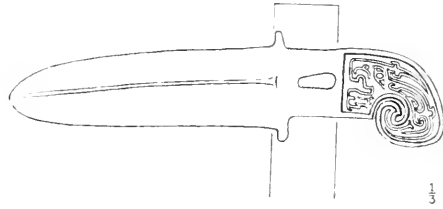
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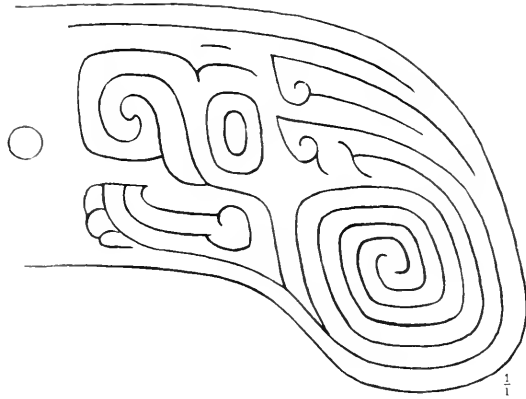
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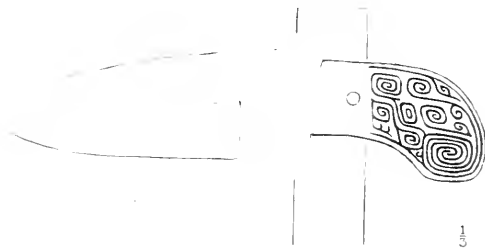
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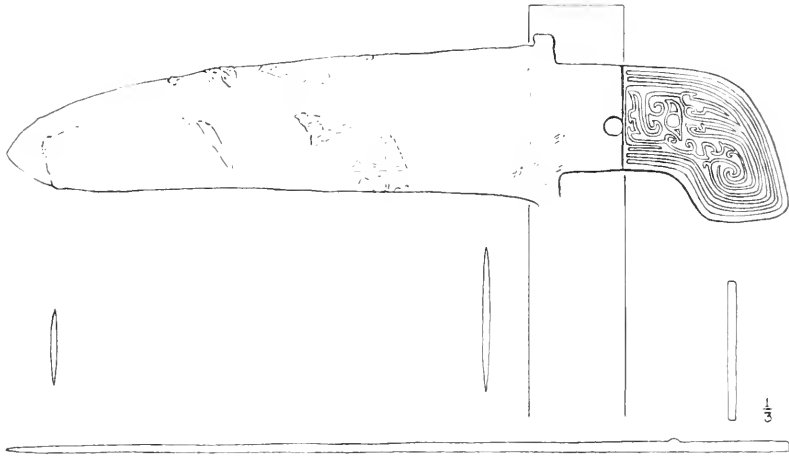
58



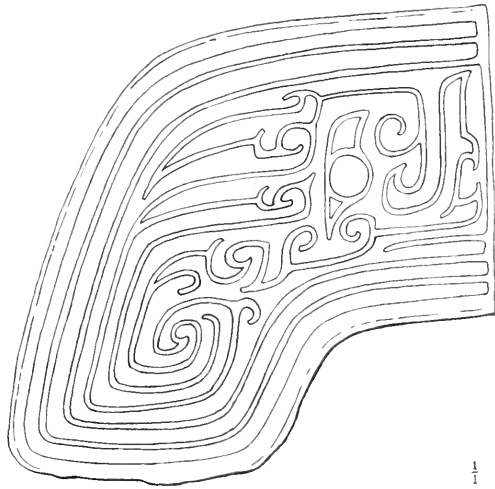
59



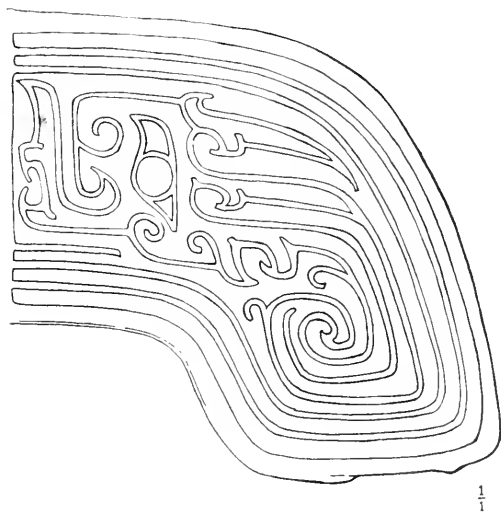
60



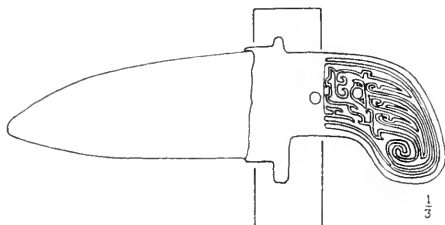
61



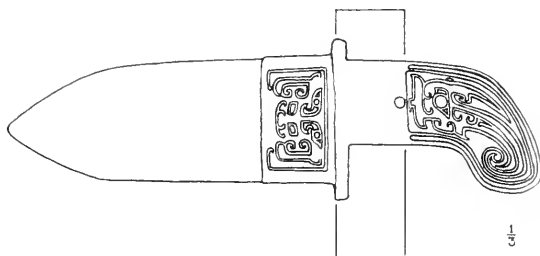
61



61

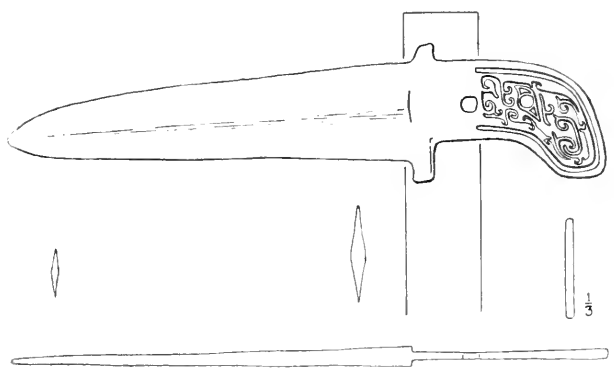


62

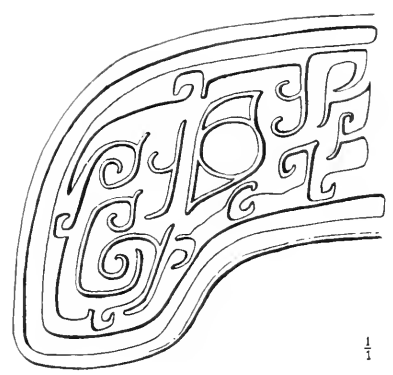


63

Type IV B

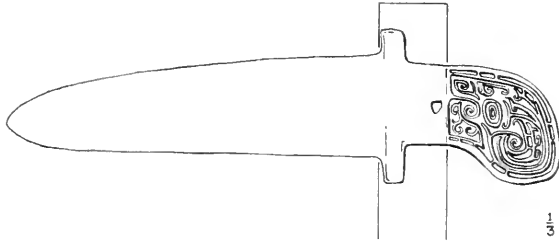


64



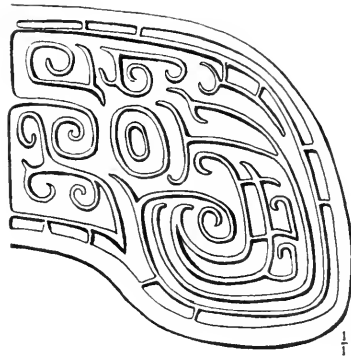
64

Type IVc



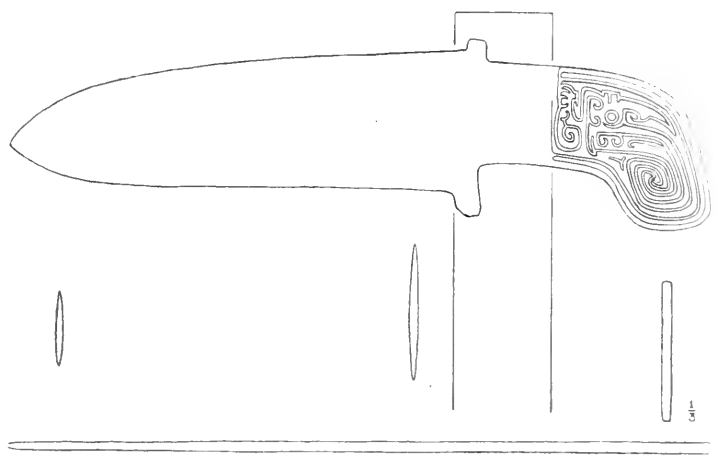
65

$\frac{1}{3}$

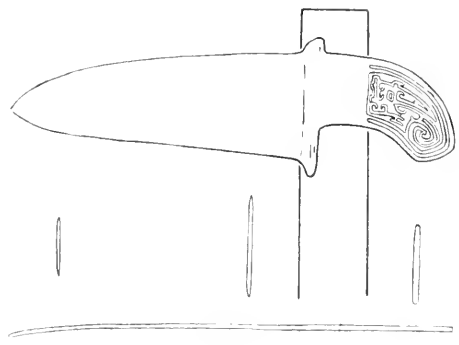


65

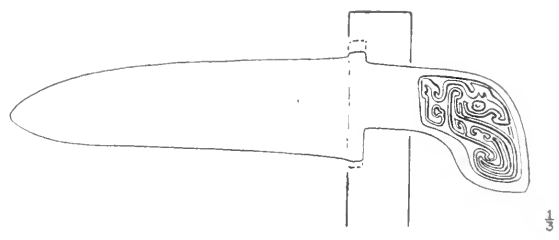
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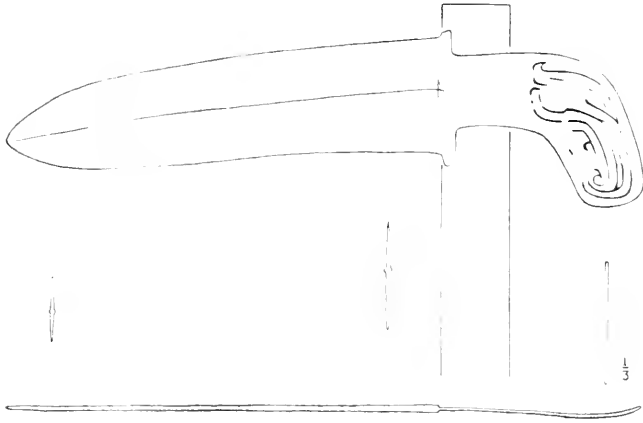
66



67



68



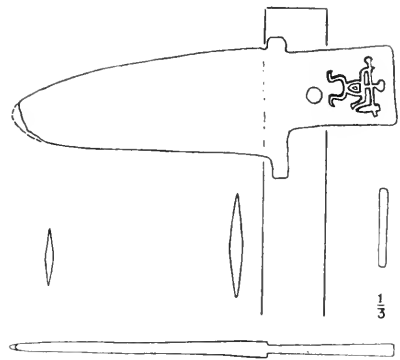
69



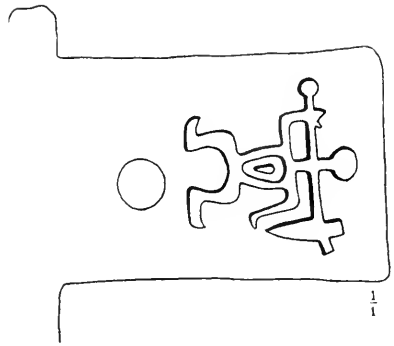
69

19

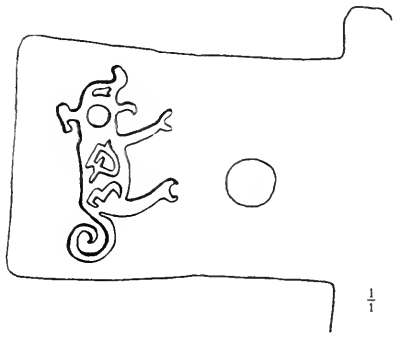
Type V A



70

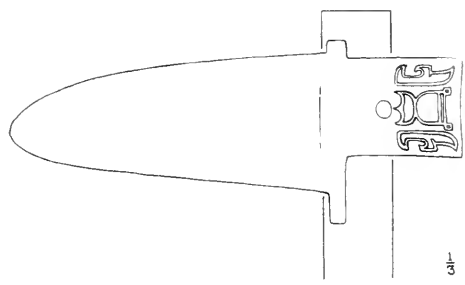


70



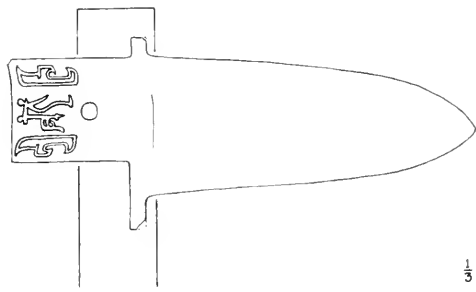
70

Type V A



71

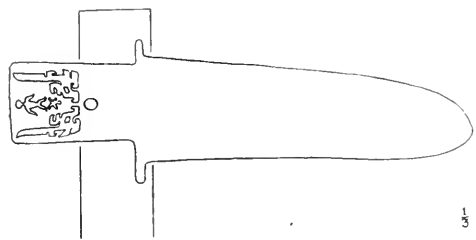
$\frac{1}{3}$



71

$\frac{1}{3}$

Type V B

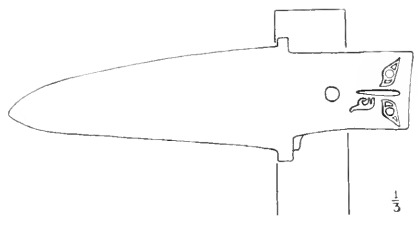


72

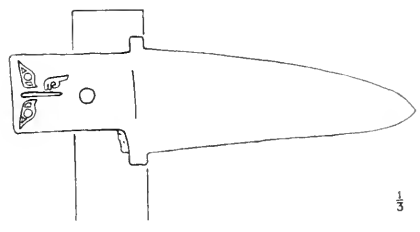
$\frac{1}{3}$

21

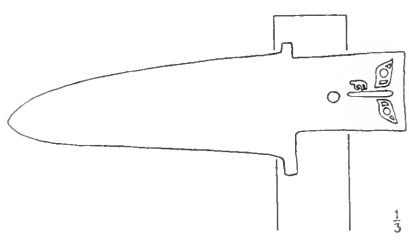
C



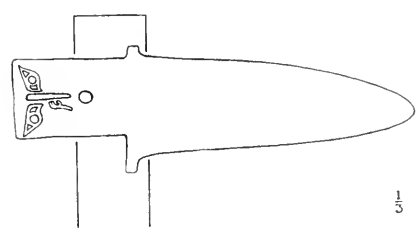
73



73



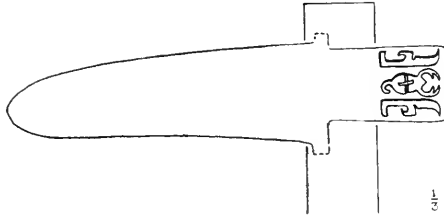
74



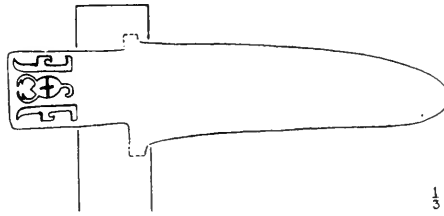
74

22

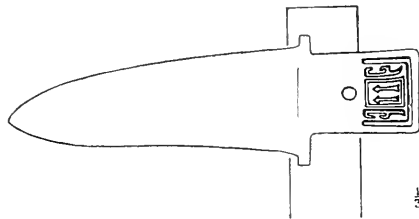
Type Ic



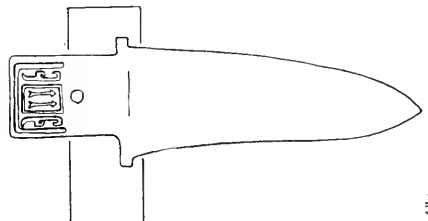
75



75

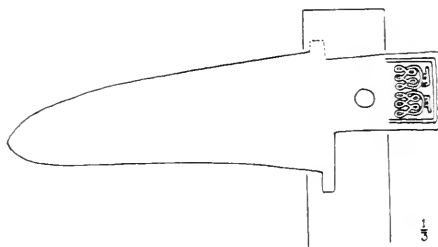


76

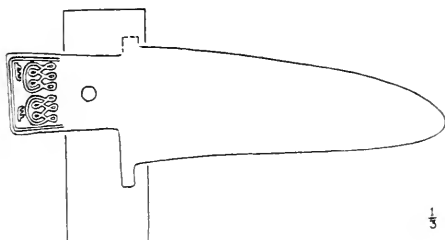


76

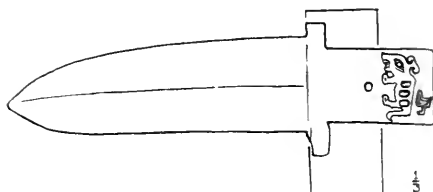
Type 5c



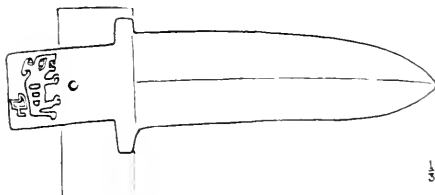
77



77



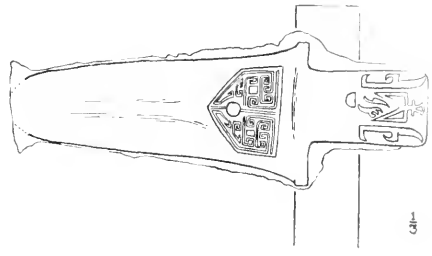
78



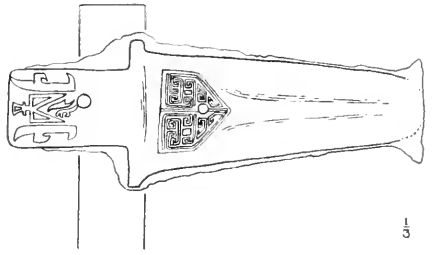
78



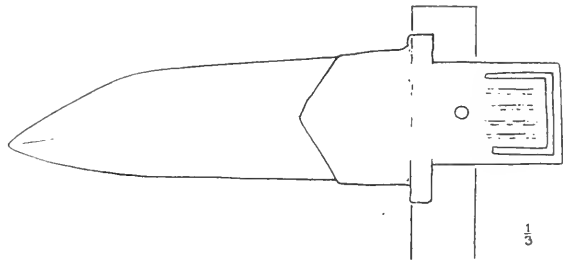
Type V c



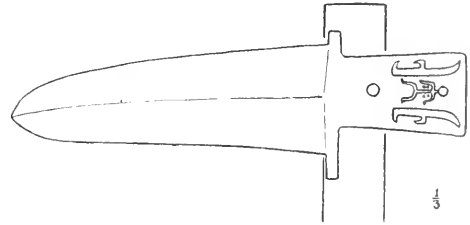
79



79



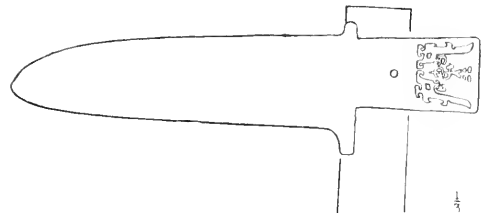
80



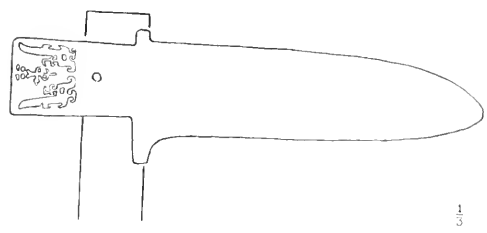
81



Type Vc

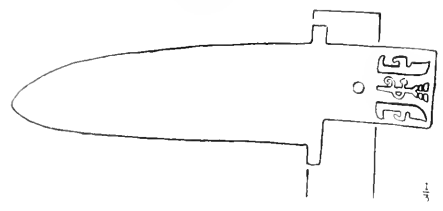


82

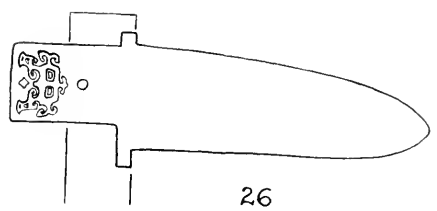


82

Type V D

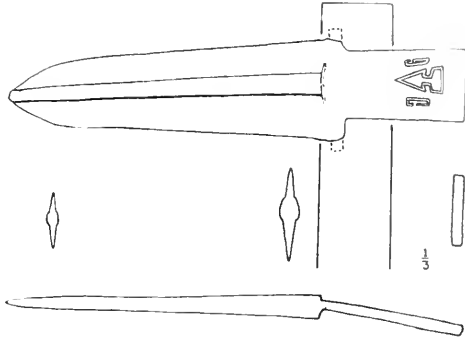


83

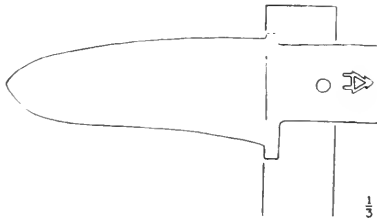


83

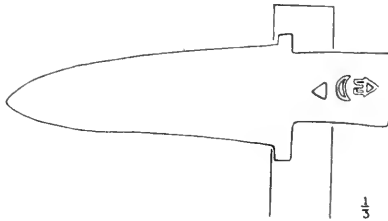
26



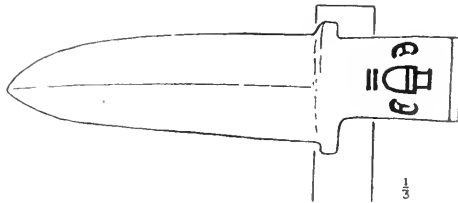
84



85

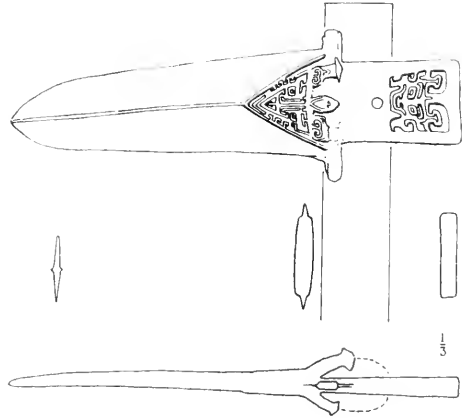


86

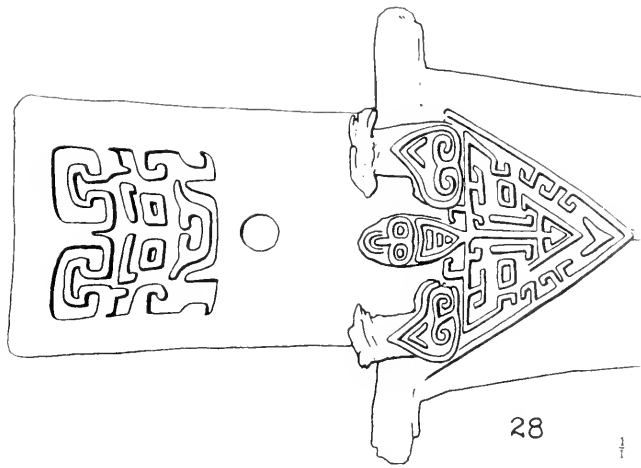


87

Type VE

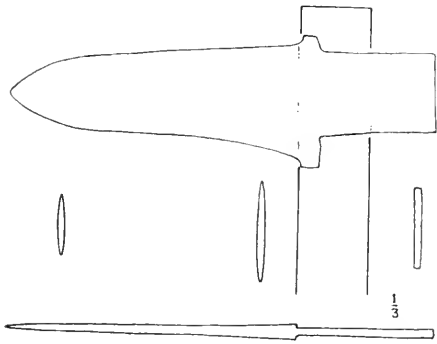


88

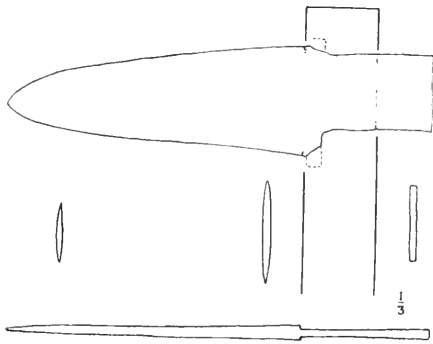


88

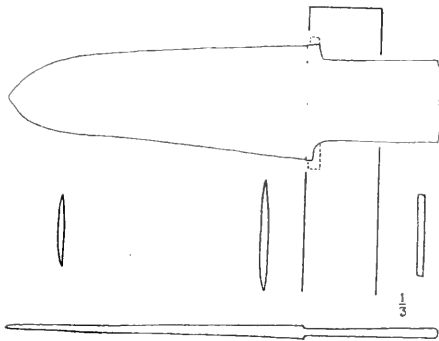
28



89

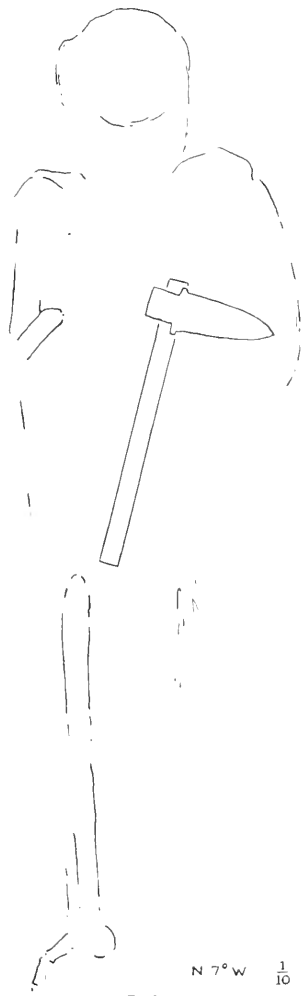


90



91

Τυρεῖς



89

N 7° W $\frac{1}{10}$

30

Type I F



12
 2 11, 12

90





11

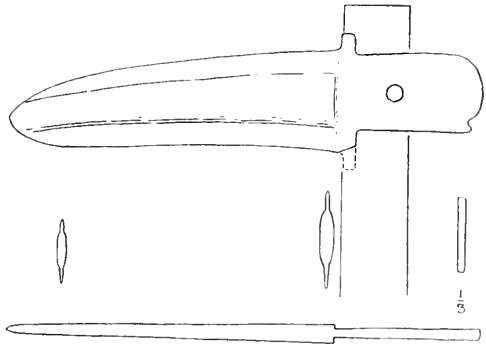


12

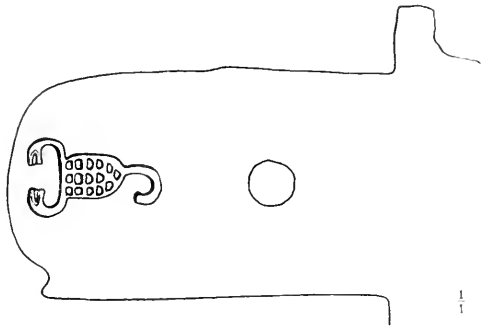


13

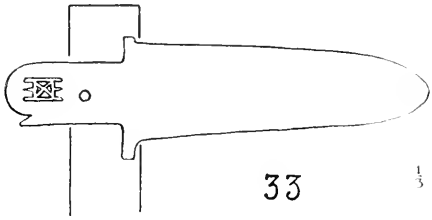
Type VI A



95



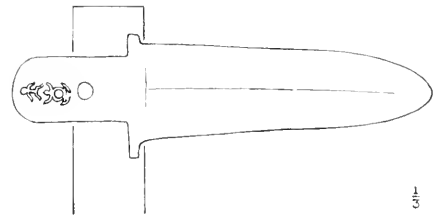
95



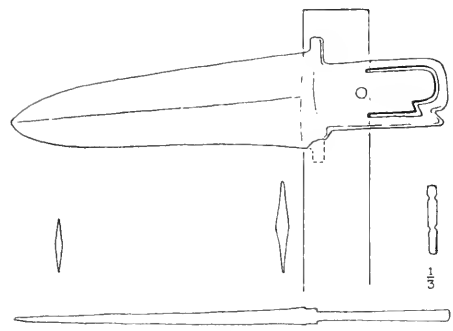
96

33

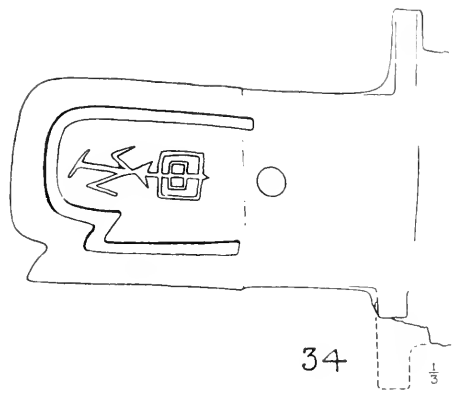
Type VI A



97



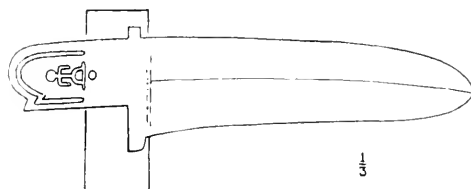
98



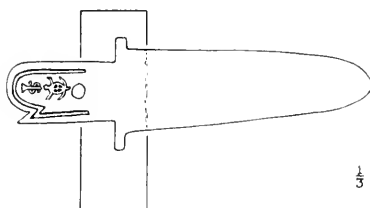
98

34

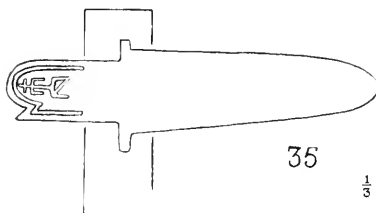
Type VI A



99



100

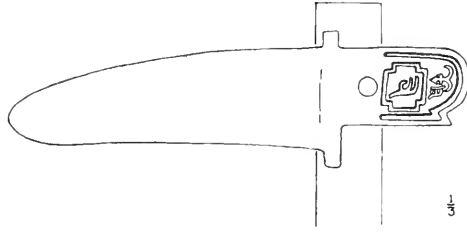


101

35

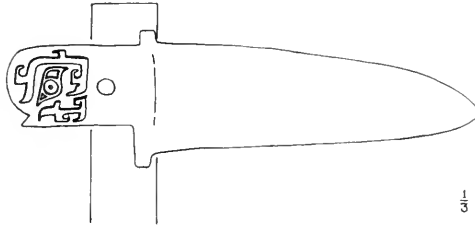
 $\frac{1}{3}$

Type VI B



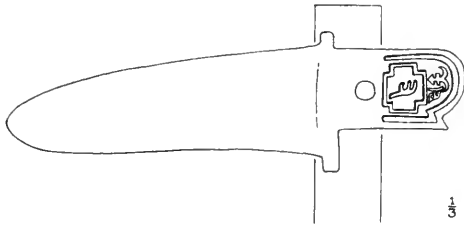
102

$\frac{1}{2}$ cm



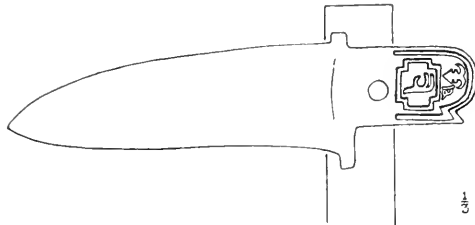
102

$\frac{1}{2}$ cm



103

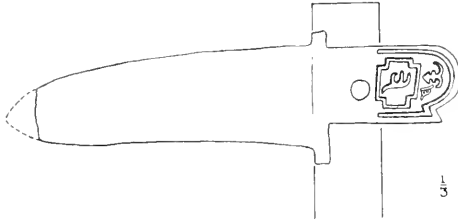
$\frac{1}{3}$



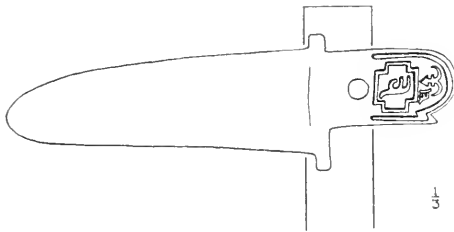
104

$\frac{1}{2}$ cm

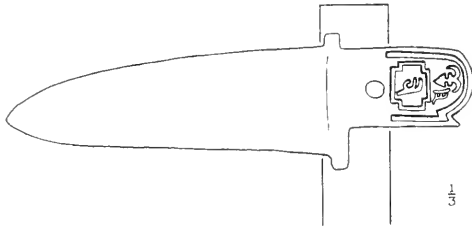
36



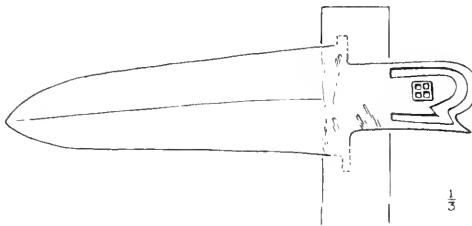
105



106

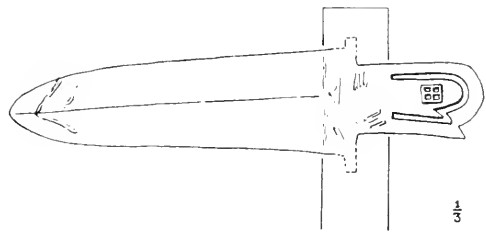


107

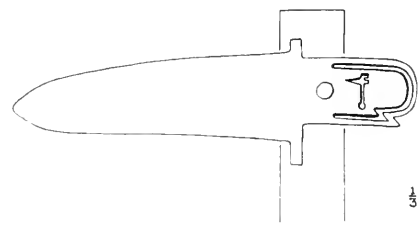


108

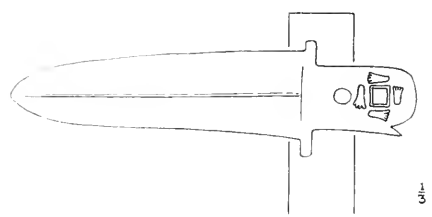
Type VIIb



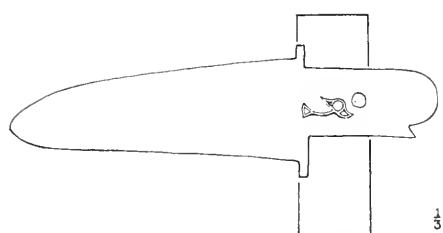
109



110



111

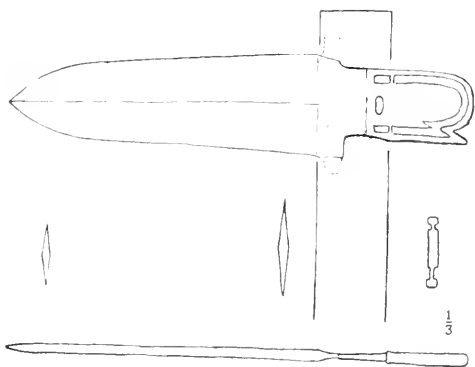


112

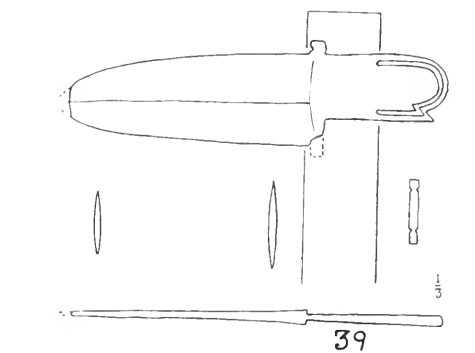
38

1/3

Type VIc



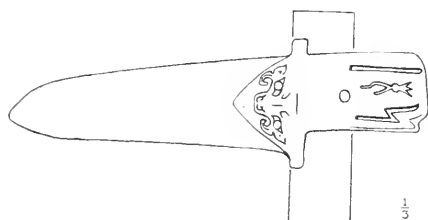
113



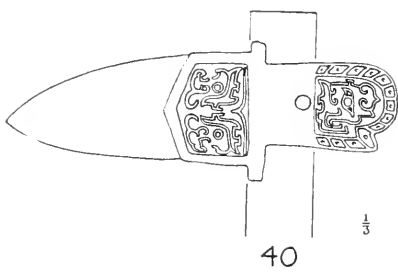
114

39

Type VI.D

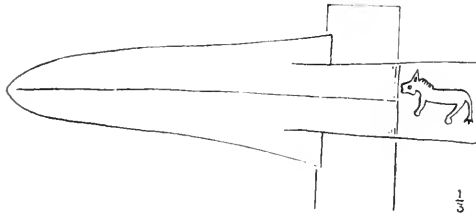


115

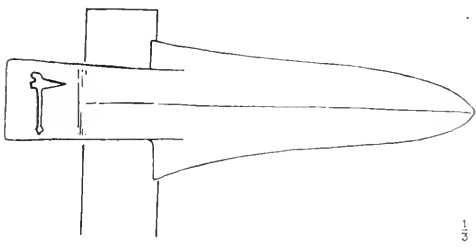


116

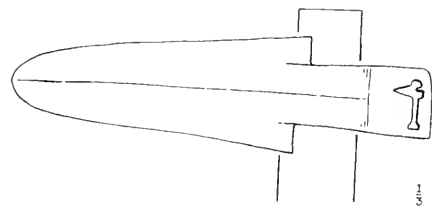
40



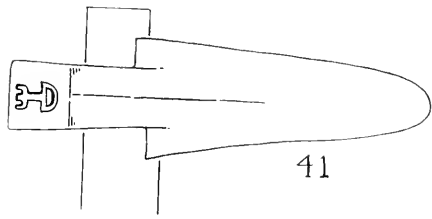
117



117



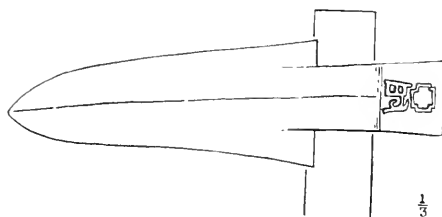
118



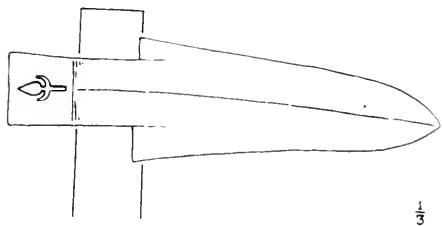
118

41

Type VII A

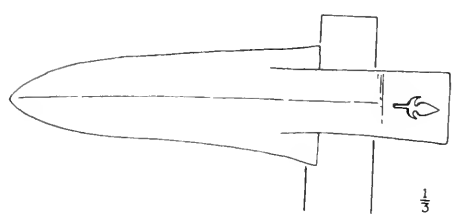


119

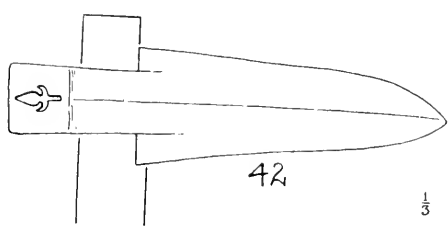


119

Type VII B



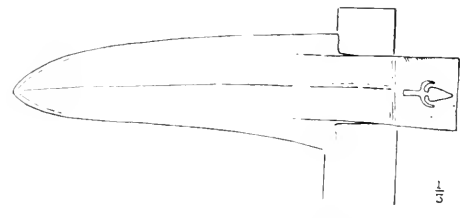
120



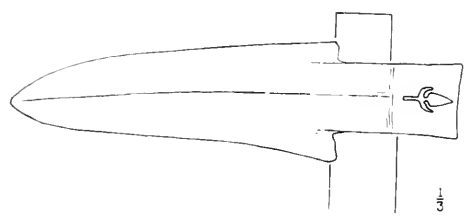
120

42

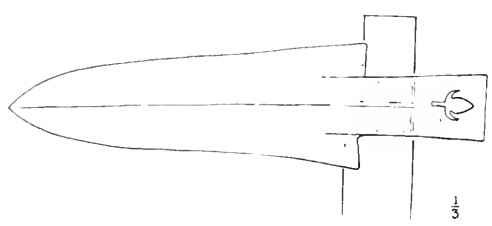
Type VII B



121



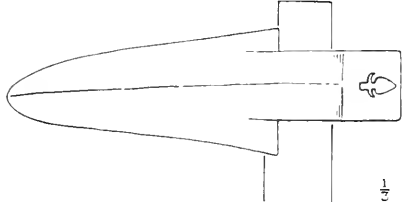
122



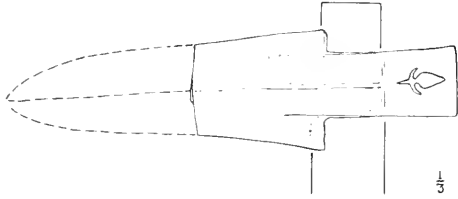
123



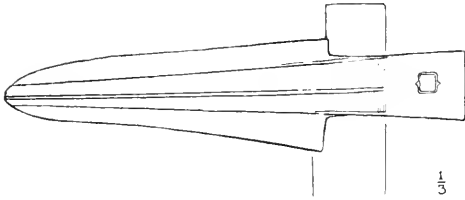
43



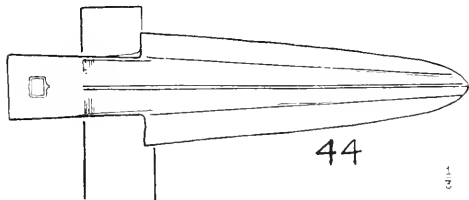
124



125



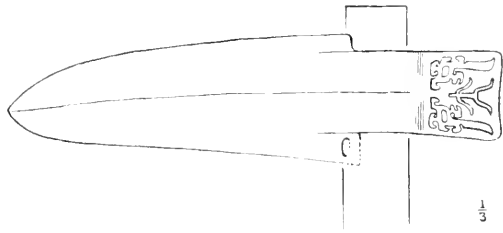
126



44

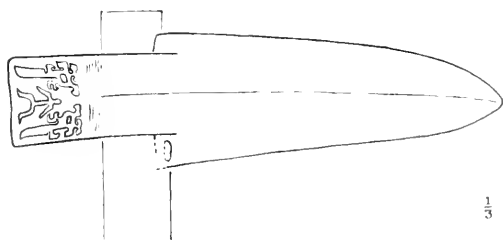
126

Type VII B



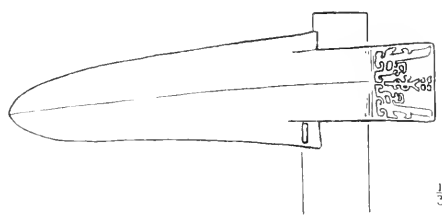
127

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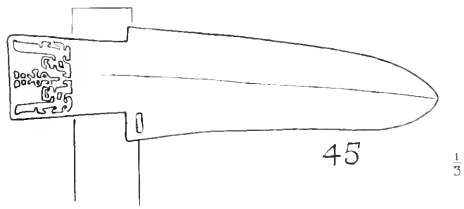
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$\frac{1}{3}$



128

$\frac{1}{3}$

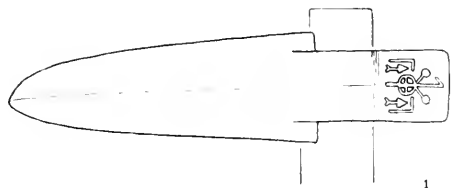


128

45

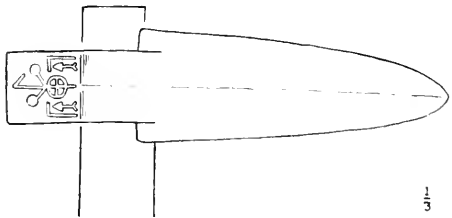
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Type VII B



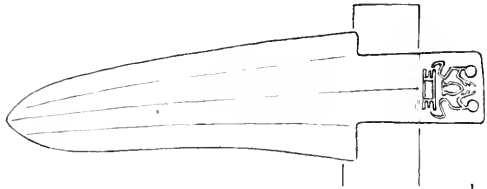
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129

$\frac{1}{3}$



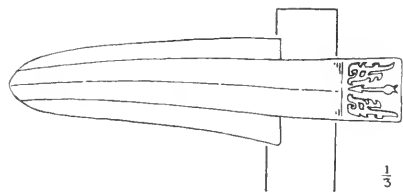
130

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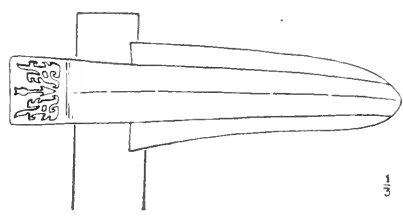


46

Type VII B

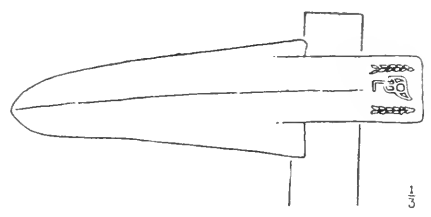


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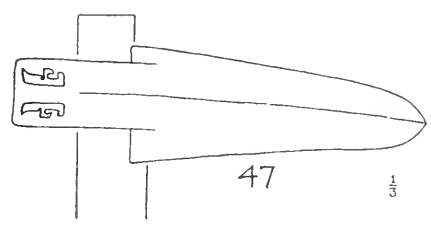


131

Type VII C



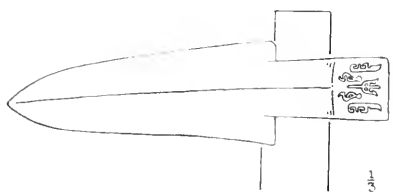
132



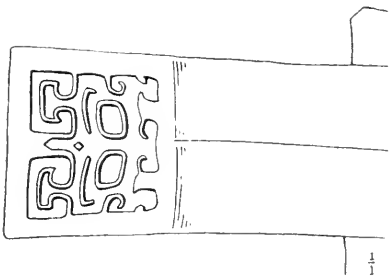
132

47

Type VII C

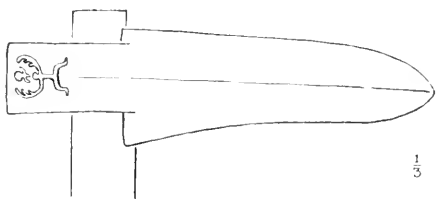


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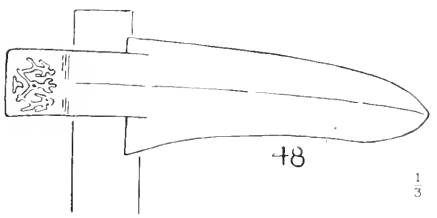


133

Type VII D



134

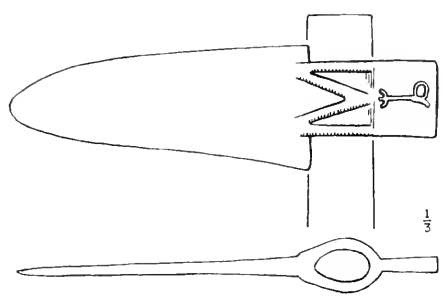


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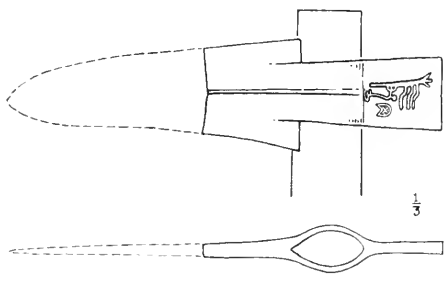
48

1/3

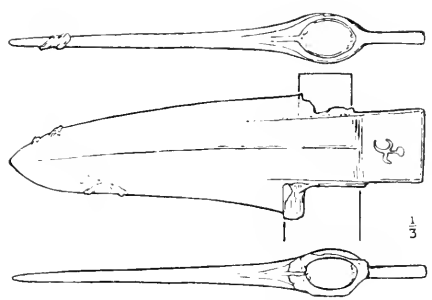
Type VII E



136



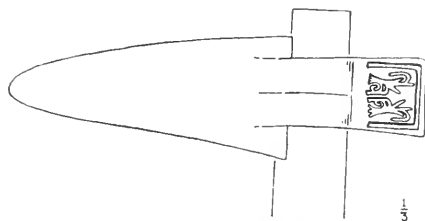
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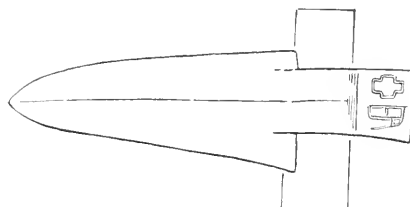
138

51

Type VII E



139



140



Type VII F

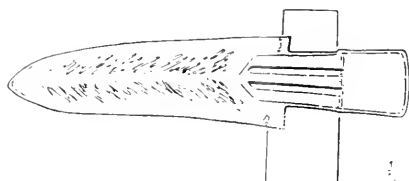


141

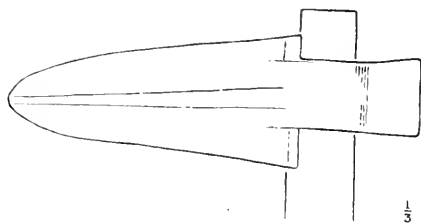
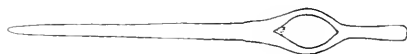


50

Type VII F



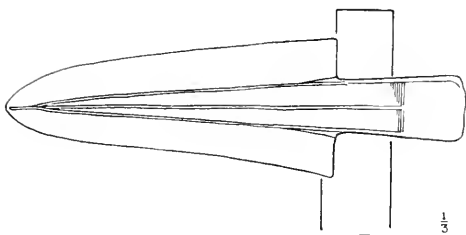
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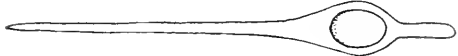
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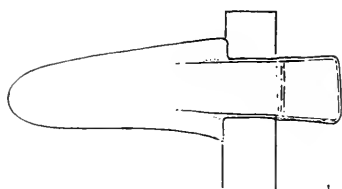


52



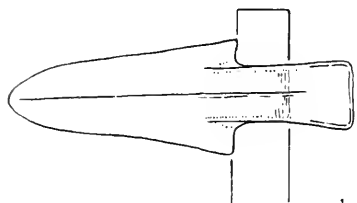
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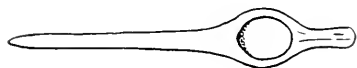
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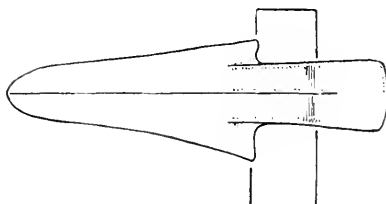


146

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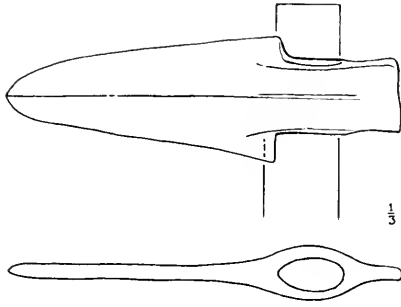
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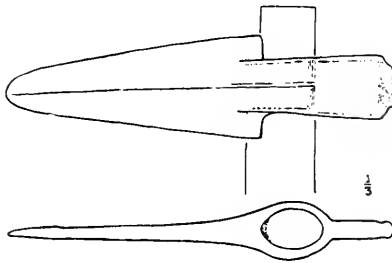
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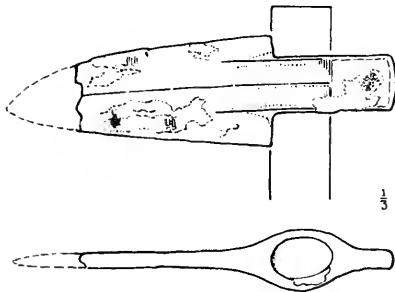


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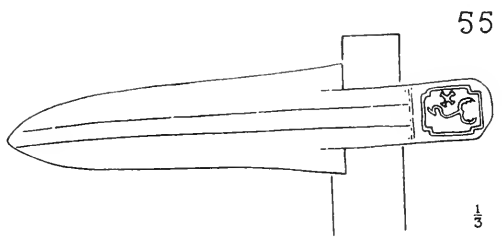
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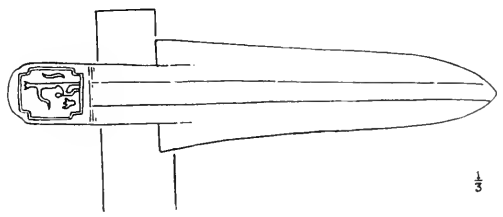
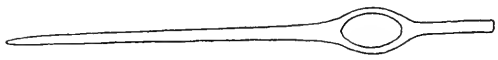
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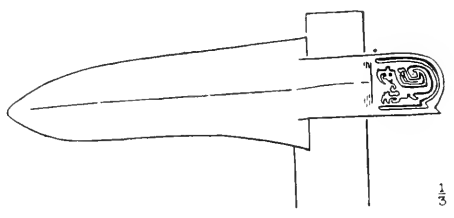
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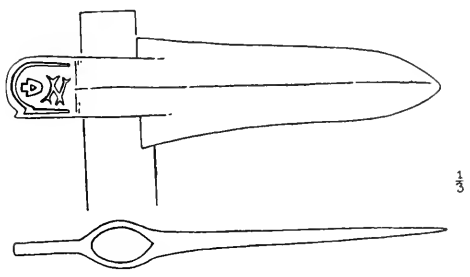
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151

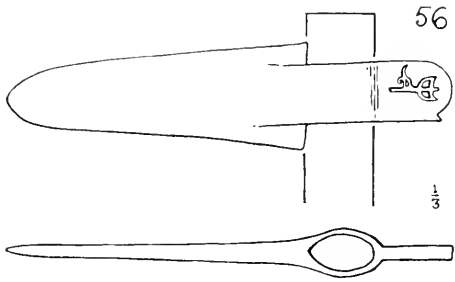


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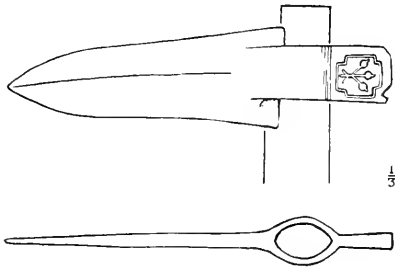


152

Type VIII B

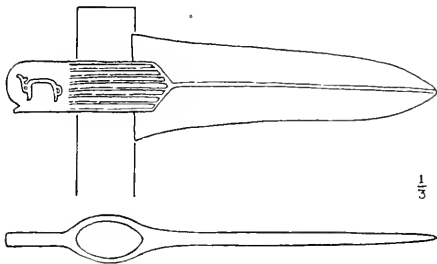


153



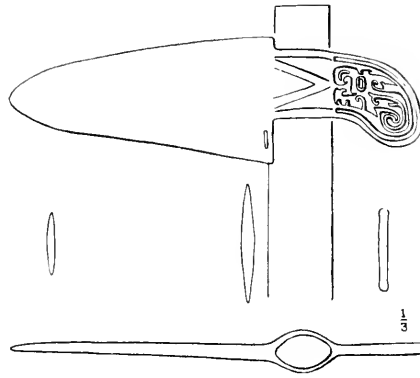
154

Type VIII C



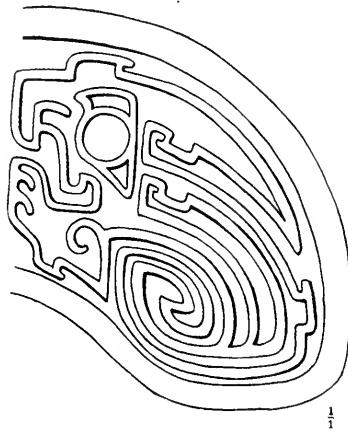
155

Type VIII D



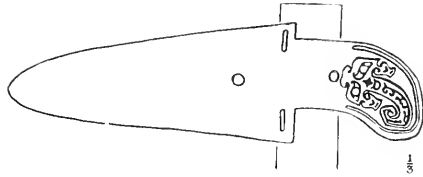
156

57

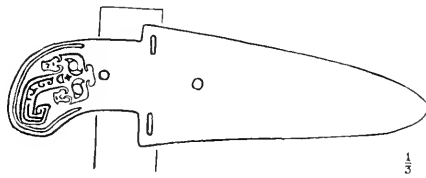


156

Type IX A



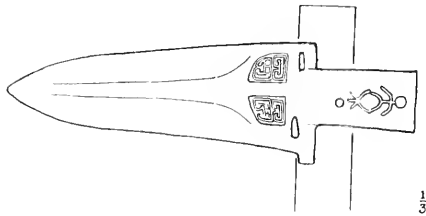
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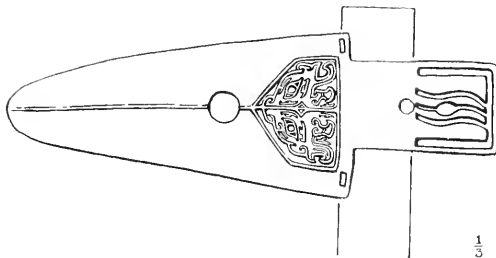
157

Type IX B

58

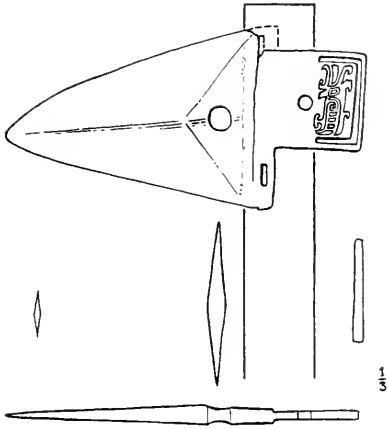


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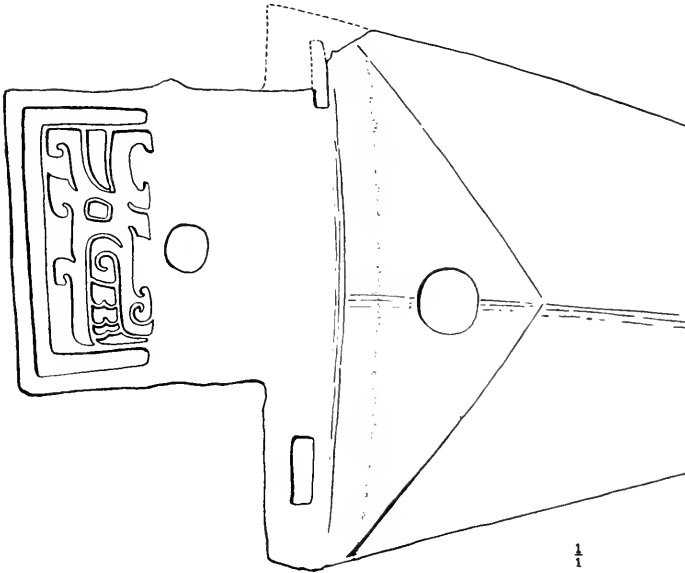


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59

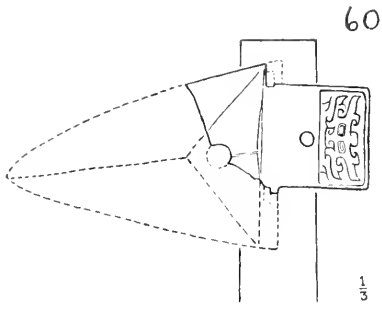


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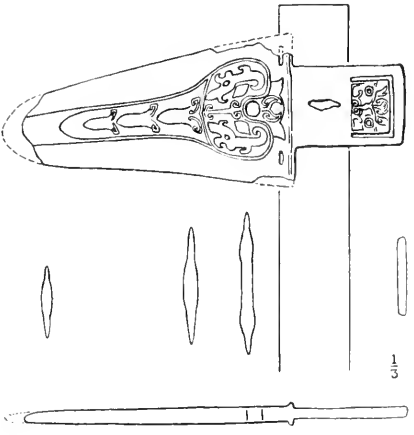
160

Type IXc



161

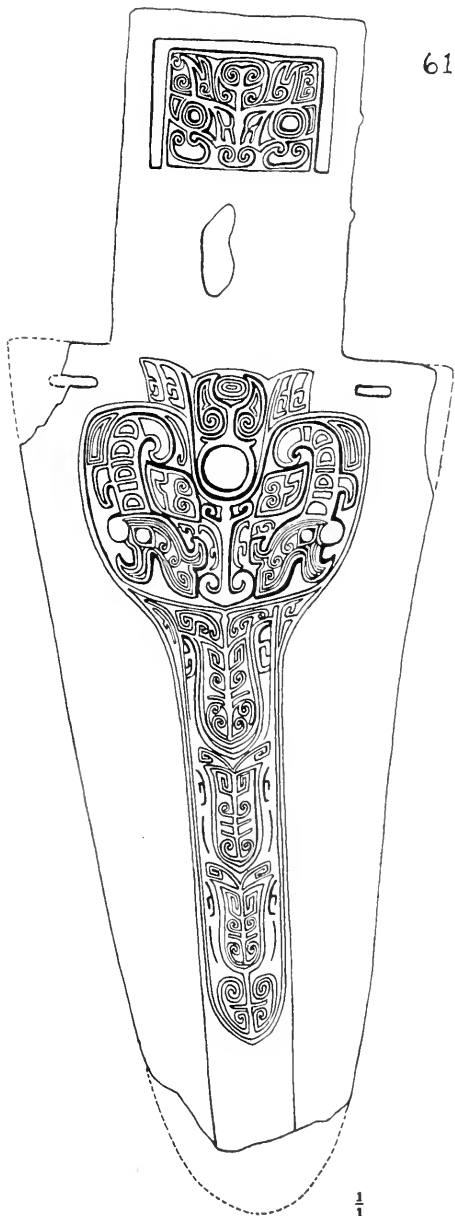
Type IXp



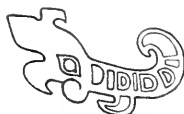
162

61

162



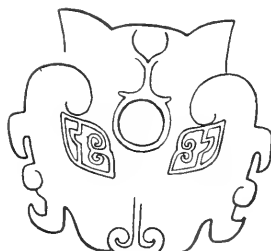
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DRAGON



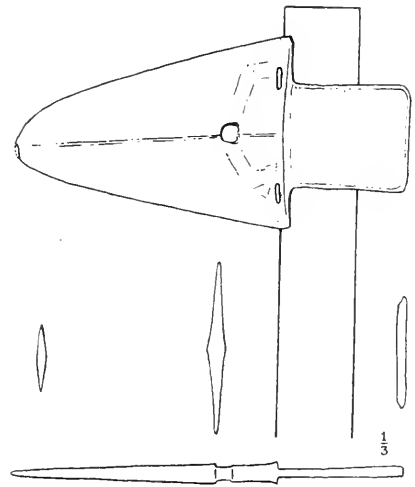
OX



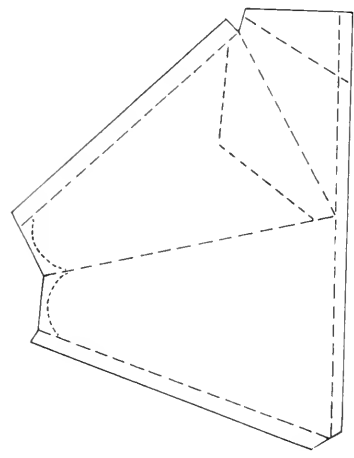
TIGER

Type IX E

62

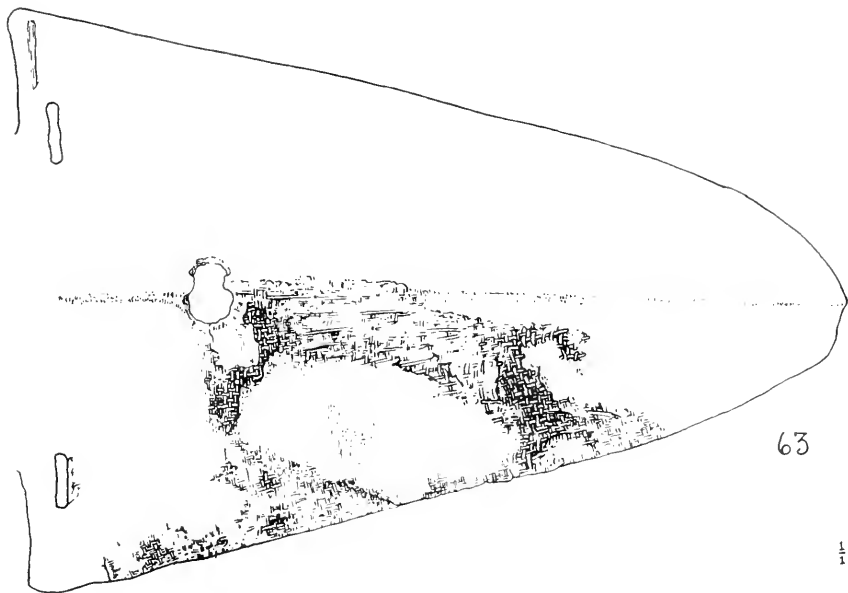


163



163

Type IX E

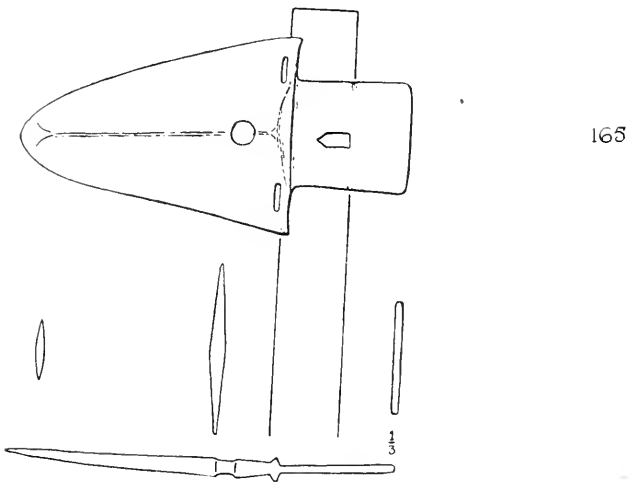
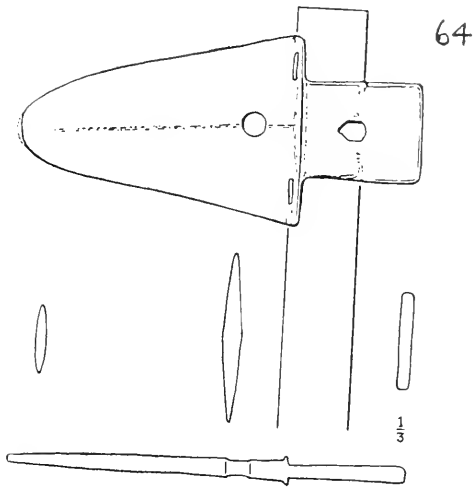


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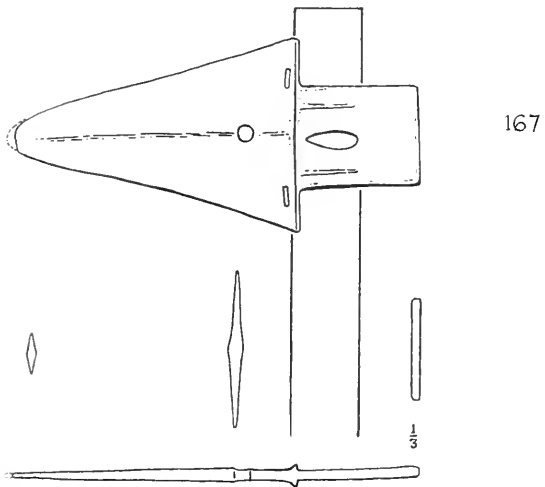
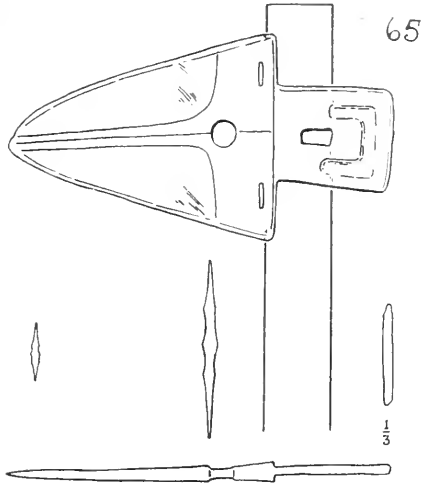
63

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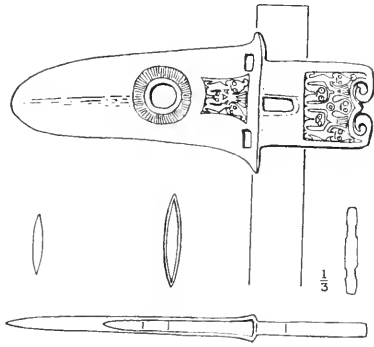
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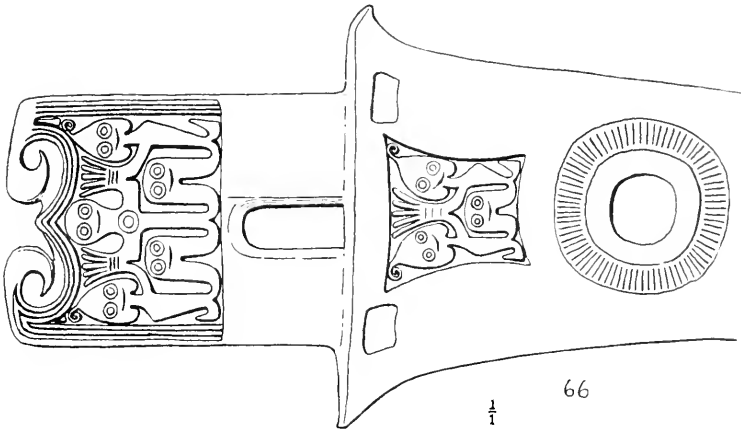
Type IX E



T. 168



168⁴⁶⁰

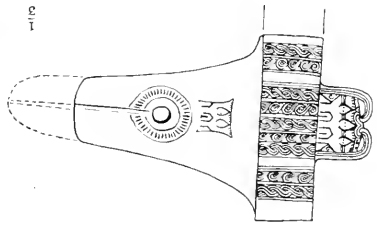


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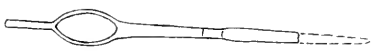
66

Toe IX F

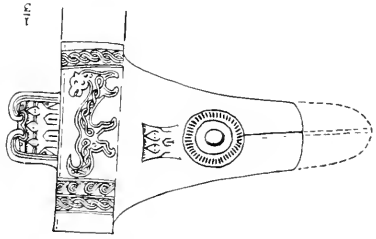
67
100



169

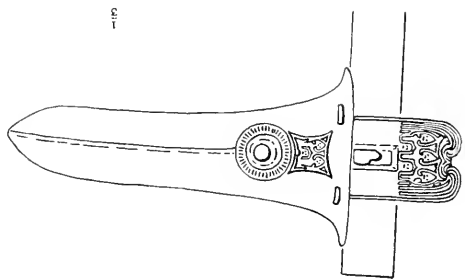


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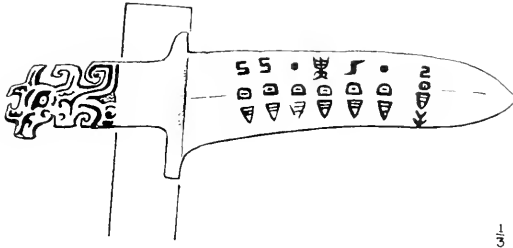
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170



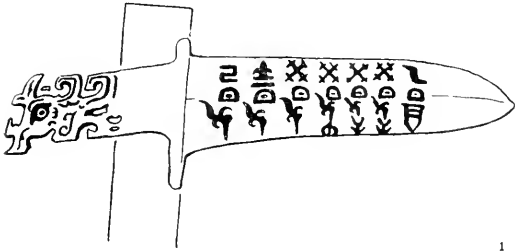
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Type XA



171

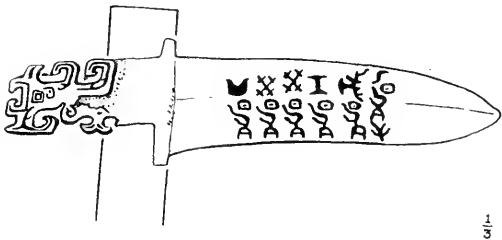
1/3



172

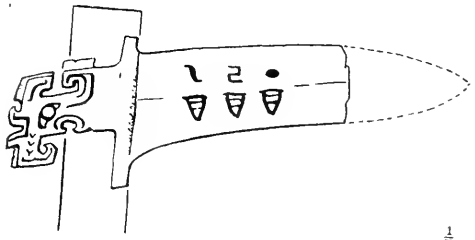
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1/3



173

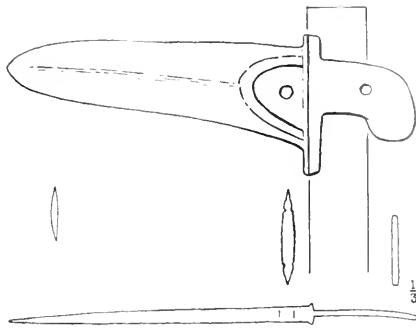
1/3



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1/3

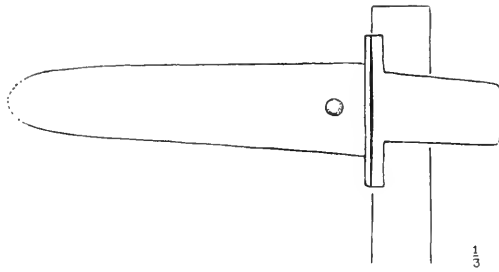
Type X B



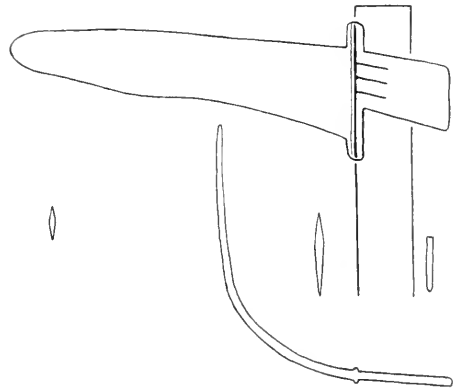
175

69

Type X C



176



177

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T (Menzies, James Mellon - Shang Ko, a study of
the characteristic weapon of the Bronze Age in
China in the period 1311-1039 B.C.) v. 2.

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May 21st, 1943

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