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HOW CHINESE BRONZES WERE MADE

Material Used

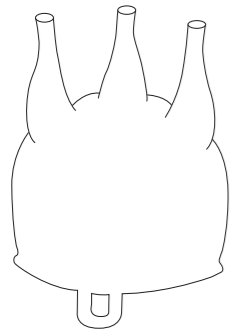
Bronze is an alloy of copper and other metals, most frequently tin. Chinese bronzes usually contain 70-90% copper. The rest is mostly tin and lead.

Bronze Casting in the Near East: the 'Lost Wax' Method

Bronze artifacts appeared in the Near East several centuries before they did in China. The bronze was generally either hammered into shape, the way a blacksmith hammers iron, or cast using the 'lost wax' technique. Using this method, a wax model of the object to be produced is made and surrounded with clay. When the clay is fired, the wax melts away (and is 'lost') and what remains is a mould into which molten bronze can be poured. Lost wax was the main casting method in both the Near East and in later China, so for many years it was assumed that ancient Chinese ritual vessels were also made using the technique. We now know this was not the case. Although the lost wax technique was known in China by at least 500 BC, the majority of bronzes were cast using piece moulds until at least the Han Dynasty (206 BC-220 AD).

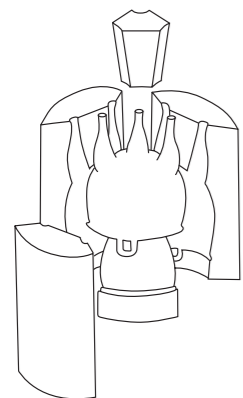
Bronze Casting in China: the Piece Mould (or Section Mould) Method

A good example of the 'piece mould' method of casting can be seen by looking at no. 85, the *ding* tripod. The oldest bronze in the Compton Verney collection, it was made using relatively simple techniques and the traces left behind by those techniques are easier to see.



To begin, a full-size model of the *ding* would have been made in clay, but without decoration. For stability, a vessel like this was probably made upside down.

Step One:
Clay model of vessel



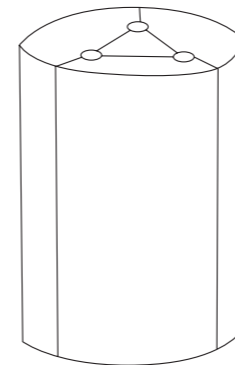
Next, sections of mould were made to surround the exterior of the model, and a core section was made to fill the interior cavity.

Step Two:
Mould sections formed
around model



Step Three:
Decoration
added to mould

The next step was to add decoration. This was done by carving into the mould while the clay was still wet. Decoration cut into the mould in this way appears as raised marks on the surface of the finished vessel. For *ding* number 85, the decorative band containing the mask design (known as a *taotie*) and the decoration on the legs were cut into the mould using a knife or stylus of some sort. The bulging eyes of the mask were probably pressed into the clay using a round object. The bars sticking out from the legs and body of the vessel, called flanges, were made by cutting away clay where the mould sections met.



Step Four:
Mould Assembled
and Ready
for Casting

Once the decoration had been added, the mould sections could be assembled and bits of bronze inserted between the exterior and the core sections to maintain proper spacing. The mould sections were securely bound together and molten bronze was then poured into the mould, probably through the opening for one of the feet.

After the bronze was poured and cooled, the mould was broken off to reveal the finished bronze. Only one vessel could be made from each mould.

Visible Traces of the Casting Process

The places where the mould sections met often did not fit perfectly. When bronze was poured into the mould, these imperfections left marks on the surface of the bronze, called casting seams. On *ding* number 85, a single casting seam runs down the front of each leg. Though somewhat harder to spot, the back of each leg has two casting seams and the bottom of the bowl has seams in a triangle. These were left by the triangular mould section that fitted between the legs (see the diagram for 'Step Two', above.)

It is not always possible to see casting seams as they were often filed down, but another example of a visible seam can be seen on the large *hu* vase, number 54. On the sides of the vessel, decoration does not align exactly and forms a vertical line. It is possible to see casting seams running down the middle of the vessel's front and back, though these are harder to spot. From these it is known that the vessel was cast using at least four tall exterior sections.

Other traces of the casting process that can sometimes be seen are the remains of core moulds. Core sections that were difficult to remove and did not interfere with the vessel's function were often left in place. Mostly these are in hollow legs, foot rings and other places that cannot normally be seen. On the *xu*, no. 20, however, the remains of the ceramic core can be seen inside the hollow handles of the vessel.

Decoration added to the model

Carving directly into the mould worked well for simply decorated vessels like no. 85, but it was less suitable for more elaborate designs. In fact, after the earliest period, carving directly into the mould was seldom used as the sole means of applying decoration. Looking at the *fangjia*, number 58, it is easy to imagine the practical impossibility of carving a negative version of such dense details. Most of the decoration on a vessel like this was probably done on the model. Then, when the mould was made by pressing it onto the model, a negative image of the decoration was transferred to the mould. It is often difficult to tell with certainty whether any given piece of decoration was made in the mould or on the model and it is thought that a combination of the techniques was often used on the same vessel.

Pattern Blocks

Another later development was the use of prefabricated pattern blocks. Owing to the discovery of the remains of an Eastern Zhou foundry, it is known that ceramic blocks were made containing a section of design in positive relief. Sheets of wet clay could be pressed into these blocks to pick up the design. Those sheets could then be used to line the mould. There were several advantages to this: blocks could be re-used many times and the flexible clay sheets could easily be trimmed and bent to fit a variety of vessel shapes and sizes. Looking at the fine spiral decorations on the cocoon-shaped *hu*, number 11, the straight lines amongst the spirals were probably made by the joints between such clay sheets.

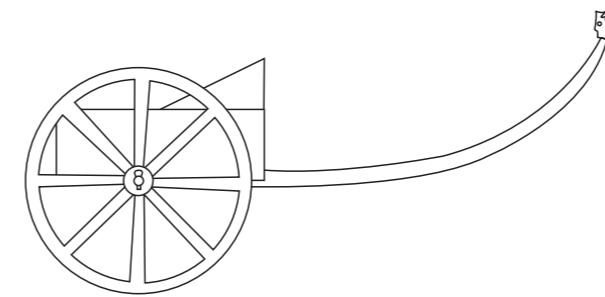
Multiple Pourings of Bronze and Lost Wax in China

Vessels were not always cast in a single pouring of bronze. Protruding features such as handles, legs, or decoration in high relief such as the animal heads on number 87 were often cast separately. Then, either they were set into the mould to be cast onto the body of the vessel or they were attached later. The first clear evidence of lost wax casting in China is seen when ornate handles and flanges made by lost wax were sometimes cast onto the body of vessels made with piece moulds. The use of lost wax casting seems to have spread gradually from these accessories to small vessels. For example, the Han dynasty incense burner, number 6, has deeply undercut sections which would have been easier to execute in lost wax than in a section mould. Eventually, lost wax was used for all bronze casting and the piece mould method was abandoned and forgotten.

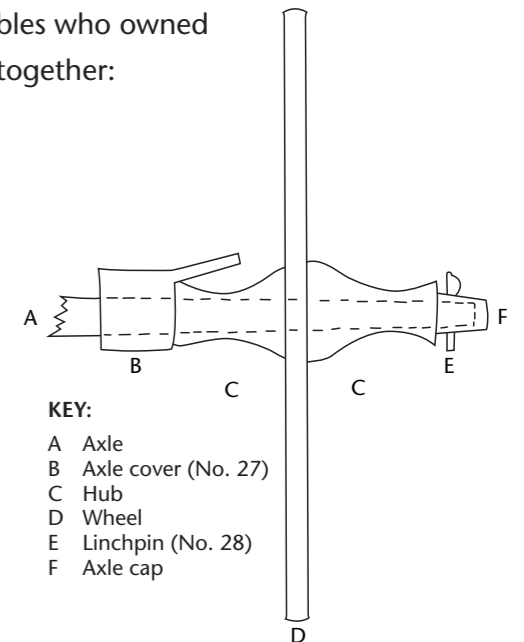
HORSE AND CHARIOT ORNAMENTS

Items 26-31 were made for chariots, charioteers and horses. Chariots decorated with items like these were often gifts from the King to reward loyalty or service. Therefore, although the chariots themselves were probably of limited use in warfare and hunting, the possession of a chariot was a clear sign of power and status. A fully-decorated chariot would have been a striking sight. Only the bronze decorations were durable enough to survive, but they were supplemented with ornaments made of more perishable materials such as tiger pelts or other animal skins, and painted or gilded wood and leather.

Chariots, horses and charioteers were sometimes buried with the nobles who owned them, so it is tentatively possible to reconstruct how these pieces fit together:



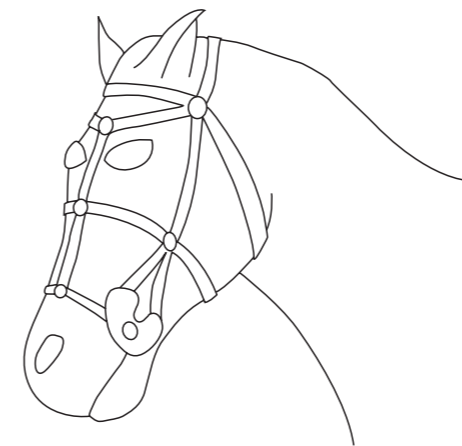
Number 26 was a finial at the end of the draught pole. A team of two or four horses would have pulled on a crossbar attached to the draught pole.



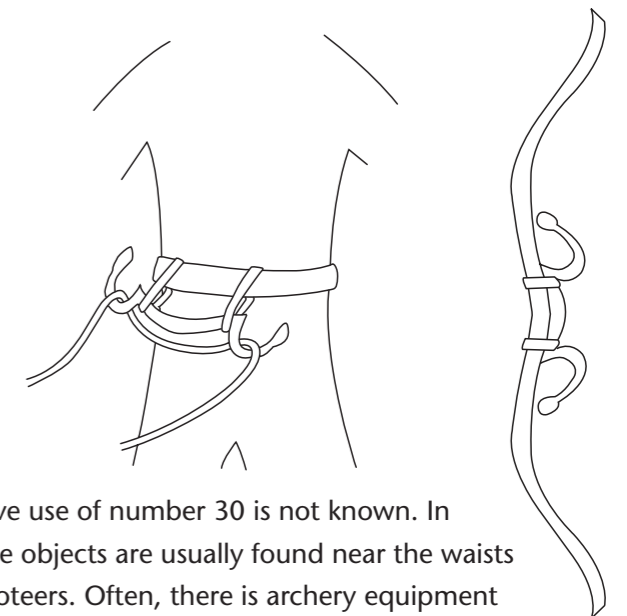
KEY:

- A Axle
- B Axle cover (No. 27)
- C Hub
- D Wheel
- E Linchpin (No. 28)
- F Axle cap

Numbers 27 and 28 were part of the wheel assembly.



Numbers 29 and 31 held the bit in the horse's mouth and were attached to the bridle.



The definitive use of number 30 is not known. In tombs, these objects are usually found near the waists of the charioteers. Often, there is archery equipment found in the same area. Scholars have suggested they may have been used as decorations or supports for wooden bows or perhaps tied to the waist of charioteers as reins holders, allowing the driver free use of his hands.

VESSEL TYPES

Vessel Names and Uses

Most of the Chinese names associated with vessels have been used for many centuries. Some, for example *ding*, were clearly in use at the time the vessels were cast. Others are useful as conventions, but are not necessarily so historically accurate.

Some vessels have subcategories, which are marked by a prefix before the vessel name. The most common prefix is *fang*, meaning 'square'. A *fangjia*, then, is a square or rectangular version of the vessel called *jia*. These subcategories are noted in the list below. One vessel is different. The Teng Hu *gui* is named after the person for whom it was made. Teng Hu *gui* can be roughly interpreted as 'the *gui* of Mr Hu from Teng'.

The exact way in which these vessels were used is uncertain. The traditional categories of wine vessel, food vessel and water vessel are taken from texts on ritual compiled at a later date. The earlier a vessel is, the less reliable these texts are. At times though, archaeological context and inscriptions have helped to shed more light on how these vessels were actually used.

Chronology

Shang Dynasty:	about 1500 BC-about 1050 BC
Western Zhou Dynasty:	about 1050 BC-771 BC
Eastern Zhou Dynasty:	770 BC-221 BC
(Spring and Autumn Period:	770 BC-475 BC)
(Warring States Period:	475 BC-221 BC)

Vessel Types in the Compton Verney Collection

BIANHU

Literally, 'disk-shaped *hu*'. An Eastern Zhou (pronounced 'Joe') version of the *hu*. See *hu*, below.

Examples at Compton Verney: Warring States: 19



DING

No vessel has more symbolic power in Chinese culture than the *ding*. This three-legged cauldron is the earliest known bronze food vessel (earlier bronzes were all wine vessels). The oldest bronze in the Compton Verney collection is also a *ding*, number 85, which dates from roughly 1400 BC. During Zhou times (about 1050-221 BC) the *ding* served as an important marker of political rank. The lowest ranking members of the nobility were permitted to display only a single *ding* in their ancestral temples while the highest could display nine or more. The Zhou Kings themselves were said to possess nine massive *ding* vessels of great antiquity. More than any other vessel, then, the *ding* was a symbol of political authority, and was especially an emblem of the 'golden age' of the Western Zhou. Much like the English word 'crown,' the word *ding* came to mean more than the object itself and took on political connotations of imperial authority.

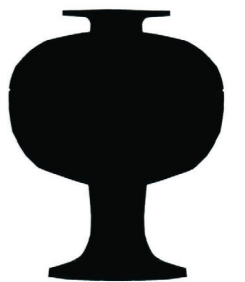
These associations helped to ensure that the *ding* remained a very common type of vessel throughout later ages. In later times it was often filled with sand and used as a censer, as with Compton Verney's cloisonné *ding* (no. 23) or the massive *ding* tripods often seen in temples and palaces throughout East Asia.

Examples at Compton Verney in chronological order:

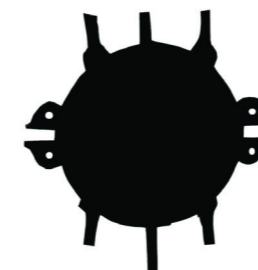
Shang: 85, 94, 45 Western Zhou: 39 Spring and Autumn: 35, 8

DOU ('dough')

The *dou* is a vessel shape of remarkable longevity. Small pottery bowls on tall feet are found far back into prehistory. Ceramic and lacquer-ware versions were very common during the Han dynasty (206 BC- 220 AD.) Later ages, down to the present day, continued to use the shape, often in ornate ceramic or cloisonné. Bronze versions are known from as early as the Shang (about 1500 BC- 1050 BC) but they are not very common. Then, at the end of the bronze age, during the Eastern Zhou period (770-221 BC) bronze *dou* rather suddenly became quite common.



Examples at Compton Verney: Warring States: 15, 14



DUI ('dway')

Early versions of this vessel are not as symmetrical as number 2: they often have flatter lids similar to those on the *ding* no. 8 or the *dou*, no. 14. By the Warring States Period (475-221 BC) the round version became the standard. Here, the lid can be overturned to make two nearly identical containers. Because the *dui* usually lack the sculptural decoration seen on other vessels, their smooth surfaces were well-suited to finely incised patterns and elaborate inlays.

Examples at Compton Verney: Warring States: 2

FANGHU ('fahng-who')

Literally, 'square *hu*.' A square or rectangular version of the *hu*. See *hu*, below.

FANGJIA ('fahng-jyah')

Literally, 'square *jia*.' A square or rectangular version of the *jia*. See *jia*, below.

FANGLEI ('fahng-lay')

Literally, 'square *lei*.' A square or rectangular version of the *lei*. See *lei*, below.

FANGYI ('fahng-ee')

Unlike other vessels prefixed with *fang* (meaning 'square'), this one is not known to have come from a round prototype. The name means simply, 'square vessel.' Despite the generic sounding name, *fangyi* have a fairly specific form. Most examples closely resemble number 91, including the distinctive peaked lid. Square and rectangular vessels like this and the *fangjia* (58), are one of the hallmarks of bronzes in the 'Anyang' style. This style is named for the period when the Shang kings made their capital near the modern-day city of Anyang (roughly 1200-1050 BC). Square vessels mark an important step in the independence of bronze design from pottery prototypes. The piece mould method used to cast Chinese bronzes was well-suited to making square shapes, whereas firing such shapes in ceramic was difficult and seldom done.

Examples at Compton Verney: Shang: 91

FOU ('foe')

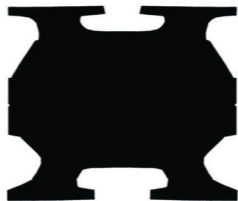
The *fou* is fairly easy to identify when, like no. 32, it has a straight section of neck rising above the shoulders. Not all vessels called by this name have such a neck though, making them similar to the *lei* or the earlier *pou*.

Examples at Compton Verney: Spring and Autumn: 32

FU

Apparently an innovation of the late Western Zhou, the *fu*, like the *dui*, had a lid which formed a second container. *Fu* are frequently found in pairs, thus making a set of four matching containers. It seems that the *fu* was used primarily to hold grain, since a lengthy inscription in a *fu* unearthed in China lists the kinds of grains which may be served in the vessel.

Examples at Compton Verney: Spring and Autumn: 40

**GU**

These round, narrow-waisted drinking vessels are the most common bronze vessels in Shang tombs. The largest undisturbed Shang tomb yet excavated, belonging to a royal consort, contained 53 *gu*. Because the *gu* is so frequently found in tombs with the *jia* and *jue*, it seems those three vessels formed the core of early ritual sets. These vessels, along with several others, quite suddenly disappear during the middle Western Zhou, suggesting a dramatic change in the rituals for which bronzes were used.

Examples at Compton Verney in chronological order: Shang: 89, 88

GUI ('gway')

The *gui* is closely associated with the Western Zhou, even though it was also made both before and after that period. Along with ding tripods and bronze bells, *gui* were used to indicate social status. Nobles of each rank were permitted to display a certain number of *ding* in their ancestral temples – they could also display the next lowest number of *gui*.



Shang dynasty *gui*, such as no. 98, tend to be relatively simple bowls on a ring foot, clearly showing the vessel's origins in pottery. During the Western Zhou, a number of elaborations developed. While the bowl which held the food is of fairly standard proportions, there are many variations in the base. Bases can be round (96, 97) or square (55), on short legs (43) or long (49). Handles are another point of variation: early on, they are sometimes absent altogether, most often there are two, but sometimes four (49). The prominent and often very elaborate handles on the *gui* suggest that holding or carrying the *gui* was an important part of some rituals.

Examples at Compton Verney in chronological order:
Shang: 98 Western Zhou: 48, 97, 55, 96, 49, 50, 43

**GUANG** ('gwahng')

The *guang* (also sometimes called a *gong*) is one of the most short-lived yet most distinctive vessels. It seems to have originated in the last half of the Shang dynasty when animal designs on bronzes became increasingly dramatic. Sometimes, as with the owl *fangjia* (number 58), these animals were shown in relief on the vessel.

Other times they are incorporated into the shape of the vessel itself, as with the two owls on the *you* (number 81) or the bottle-horned dragon on the lid of Compton Verney's *guang*, number 92. The *guang* disappeared with so many other vessel types during the Western Zhou ritual reforms.

Examples at Compton Verney: Shang: 92

HE ('huh')

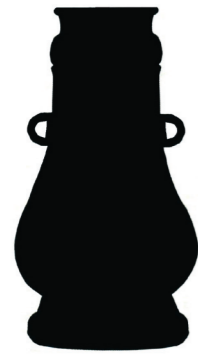
Ceramic versions of this vessel have been found in sets with some of the earliest bronze wine vessels. It is guessed they were used for pouring water to dilute the wine used in rituals. Although no vessels made out of hammered bronze have ever been found in China, the history of the *he* suggests they may have been made that way before cast bronze vessels became the standard. Some early ceramic *he* have decorations imitating rivets, crimped seams, and other features that would be seen on hammered vessels. Later, bronze versions of the *he* are also found in wine sets, but at some point they were paired with water basins and used for ritual hand washing.



Though many *he* look very much like teapots, there is no evidence that the Chinese drank tea until many centuries after these vessels were made.

Examples at Compton Verney in chronological order: Spring and Autumn: 34 Warring States: 10 Han: 9

HU ('who')



The Compton Verney collection clearly shows the wide variation in vessels labelled *hu* – perhaps more variation than in any other type. This variation can be seen in the shapes of the vessels (compare no.s 3, 13, 19 and 53, for example), in their size (36 and 54), as well as in their decoration. A partial explanation for this variation is its longevity: Although the oldest ones at Compton Verney are from the Western Zhou, the *hu* was also made during the Shang dynasty. But when many of the other ancient Shang wine vessel forms were suddenly abandoned in the middle of the Western Zhou, the *hu* instead assumed a position of prime importance: Not only was it the most common wine vessel of the period, it was usually made in pairs, and often on the grand scale of no.s 52, 53, 54 and 59. Just as important in explaining the variety of shapes and decorations is the fact that

the *hu* retained its popularity during the later Eastern Zhou. During that period, the weakening political and ritual authority of the Zhou court was met by an increase of new and regional styles. From this time we find things like the bold variation in shape of number 11, or the inlay decoration style of 56.

Examples at Compton Verney in chronological order: Western Zhou: 54, 53, 52, 59, 44 Spring and Autumn: 36 Warring States: 3, 63, 19, 13, 56, 11

JIA ('yah')

These medium sized wine vessels have the distinction of being the earliest vessel type yet discovered in bronze. The posts on the rim of the vessel are thought to have been used to lift the vessel from a fire over which it had been placed to warm its contents. Like the *gu* and *jue*, it suddenly disappears from tombs after the middle of the Western Zhou.

Examples at Compton Verney in chronological order: Shang: 58, 76



JIAN

A large water container most often made during the Zhou period. The character used to write *jian* also has the meaning of 'mirror'. The early form of the character seems to be a pictograph of a person leaning over a vessel: this has led to speculation that the surface of water stored in these vessels was sometimes used as a mirror.



Examples at Compton Verney: Warring States: 42



JUE ('jueh')

The *jue* is sometimes referred to as a cup, because that is how it was defined in an early dictionary. Its shape obviously suggests that it was used for pouring rather than drinking, however. Like the *jia*, it has posts, probably for lifting it from a heat source. Given that it is regularly found in sets with the *jia* and *gu*, it seems that ritual offerings to ancestors involved the warming and pouring of wine as part of the ceremony.

Though the *jue* suddenly vanished from ritual sets in the Zhou, its distinctive profile

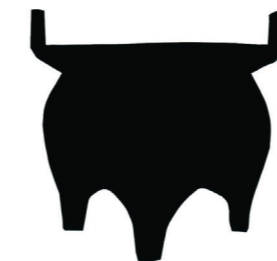
helped to make it an often-copied form in later centuries.

Examples at Compton Verney: Shang: 90

LEI ('lay')

During the Shang and Western Zhou the *lei* is usually the largest of the wine vessels. Though the *lei* is seen less frequently after the ritual changes during the Western Zhou, the name is still used for vessels such as the massive number 41.

Examples at Compton Verney in chronological order: Shang: 62, 61 Western Zhou: 57 Spring and Autumn: 41



LI ('lee')

One of the most distinctively shaped Chinese vessels, the *li* was a common pottery vessel of the neolithic cultures of North China. Number 93 is an unusually large and well-preserved example. The *li* would have been placed over coals in order to heat its contents. The *li* was translated into bronze early in the Shang dynasty. It often featured mask designs on the legs, whose bulging shape makes the design stand out

(see the legs of the yan steamer, no.75, for a similar effect). Number 38 makes an interesting comparison. It comes from many centuries after the techniques for making highly ornate bronzes were perfected, yet its simple design seems to be an attempt to recall the vessel's pottery origins.

Examples at Compton Verney in chronological order: Neolithic: 93 Western Zhou: 38

LIDING

Literally, 'li-shaped ding'. See also ding and li, above.

This name sometimes is used for vessels which share characteristics of both the *ding* and the *li*.

Examples at Compton Verney: Spring and Autumn: 8

PAN ('pahn')

Water vessels called *pan* are sometimes fairly deep, like no. 37, but more frequently they are shallow like no. 82. Because the interior of the shallow ones is easily visible, this space was often used for decoration, a rarity with other vessel shapes. The British Museum collection for instance, has a famous *pan* with a coiled dragon on the interior. Another famous *pan* bears a long inscription of great historical importance, recounting the family history of its owner and the history of the Zhou Kings. The interiors of both *pan* at Compton Verney are inscribed, though not with anything so elaborate.



Examples at Compton Verney in chronological order: Shang: 82 Spring and Autumn: 37



POU ('po')

The shape of the *pou* clearly calls to mind a simple pottery vessel, and indeed, ceramic versions of the *pou* are common in Shang tombs. They are often found in ritual sets with bronze wine vessels such as the *jue* and *jia*.

Examples at Compton Verney: Shang: 95

XIAOYOU ('shyao yo')

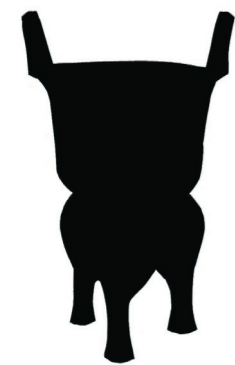
Literally 'owl you' During the Shang dynasty you wine containers were commonly made in the shape of two owls back to back. See *you*, below.

Examples at Compton Verney: Shang: 81

XU ('shoe')

This covered food dish is related to the *gui*, though it is not nearly so common. The bowl of the *gui* is always round, but the *xu* is an oval or rounded rectangle. Like the *gui*, the *xu* is found in versions on legs and on foot rings.

Examples at Compton Verney: Western Zhou: 20



YAN ('yen')

Number 75, a *yan*, is a steamer. It has the same hollow legs found on the *li*. These would have been filled with water and the vessel placed over coals or a fire. Food – traditionally thought to be grain – would have been suspended in the top section for cooking.

Examples at Compton Verney: Shang: 75



YOU ('yo')

The *you* occurs in a variety of styles, but they almost always includes a lid and handle. The earlier ones often have a round body and a tall, slender shape like number 83, making them difficult to distinguish from early versions of the *hu*. Also very common in both the Shang and Western Zhou are shorter versions with an oval cross-section such as 47, 60, 77 and 84.

Inscribed bronzes often commemorate gifts given to the owner of a vessel by the king. These gifts include such things as metal for casting vessels, chariot ornaments, fine clothing and wine to be used in sacrifices and ritual banquets. The unit in which gifts of wine are made is the *you*.

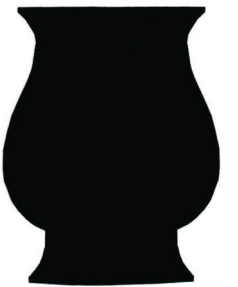
Examples at Compton Verney in chronological order:

Shang: 81, 83, 84, 77 Western Zhou: 60, 47

ZHI ('jer')

Number 78, the only *zhi* in the Compton Verney collection, is shaped like a smaller version of a rounded *zun* (such as number 48.) They are also seen in taller, more slender versions and square versions. They often are found with lids.

Examples at Compton Verney: Western Zhou: 78



ZUN ('dzwun')

The most distinctive feature of the *zun* is its flared mouth. Below this trumpet-like opening are found a variety of body shapes. Early examples were made with prominent shoulders, often featuring animal head decorations. See number 87 with its rams' heads for an example. Later in the Shang period, these were replaced with vessels having a much straighter profile, so that they resemble a larger, stouter *gu* beaker. Number 86 is an example of this style. Still others, like no. 46, have a rounded profile, much like a large *zhi*.

Examples at Compton Verney in chronological order: Shang: 87, 86 Western Zhou: 46

Sources and Further Reading

Bagley, Robert, 'Replication Techniques in Eastern Zhou Bronze Casting.' In Steven Lubar and W. David Kingery, eds., *History from Things: Essays on Material Culture* (Washington and London: Smithsonian Institution Press, 1993), pp. 234-41.

Bagley, Robert, *Shang Ritual Vessels in the Arthur M Sackler Collection*, v. 1, Smithsonian, 1995.

Chase, W. Thomas, *Ancient Chinese Bronze Art: Casting the Precious Sacral Vessel*, China House Gallery, New York, 1991.

Ledderose, Lothar, *Ten Thousand Things: Module and Mass Production in Chinese Art*, Princeton, 2001. (Especially Ch 2, 'Casting Bronze the Complicated Way')

Rawson, Jessica, *Chinese Bronzes: Art and Ritual*, British Museum Press, 1987.

Rawson, Jessica, *Western Zhou Ritual Bronzes in the Arthur M Sackler Collection*, v. 2, Smithsonian, 1995.

So, Jenny, *Eastern Zhou Ritual Bronzes in the Arthur M Sackler Collection*, v. 3, Smithsonian, 1995.

Wen Fong, ed., *The Great Bronze Age of China*, New York, Metropolitan Museum of Art, 1980.