TERRA COTTA SOLDIERS

Perhaps the best known archaeological discovery in China is the famous mausoleum complex of the First Emperor of Qin (Qin Shihuangdi), who succeeded in unifying China under the Qin empire when Qin finally conquered all of its neighboring states in 221 BCE. When he was only 13 years old, the First Emperor ordered the construction of his grand tomb complex, which took nearly 40 years to build using (according to ancient texts) more than 700,000 workers.

The tomb itself, which lies under the huge artificial mountain called Lishan, has not been opened by archaeologists nor by any other group in modern times (although it quite likely was looted when the Han state conquered Qin and sacked the Qin mausoleum). In the spring of 1974, farmers drilling a well some distance east of the tomb found a life-sized human head made of pottery, and archaeological excavations revealed a buried regiment of life-sized terra-cotta soldiers. Expanded excavations over the past 25 years have now uncovered a number of such pits — a virtual underground city — containing some 7,000 life-sized soldiers (including officers, foot soldiers, and cavalrymen), each carefully produced to give details of armor, clothing, hairstyles, and symbols of rank. Many of them also carry bronze swords, spears, crossbows, and other weapons, and some of the formations include horses and chariots.

The figures were produced in pieces using molds, and the hands and heads were then inserted into the bodies to create the full figure. Many of the faces are unique, and it is possible that at least some of the figures are actual portraits of officers in the Qin guard. Although the soldiers today are a uniform “terra-cotta” color, they were originally painted in bright colors, some of which is still adhering to a number of the figures. The entire massive formation of soldiers guarded the First Emperor’s tomb in death just as his army guarded him in life, but in the end, both his empire and his tomb fell to the conquering Han state.

The miniature terra-cotta figurine included in this kit gives you some idea of the details shown, but it is very important to remember that the original figures are about 1.8 meters (5’10”) tall, and the details they show are much more vivid than can be shown in this miniature.
Lacquer is a type of paint that comes from the sap of the lacquer tree (*Rhus vernicifera*), which is widely distributed throughout southern and central China and elsewhere in East Asia. Small incisions are carved in the tree’s bark, and a white sappy substance slowly oozes out, which turns black when exposed to air. It is collected in trays or buckets, and is then processed by boiling and straining out impurities. The lacquer paint, which was colored with the addition of cinnabar (red), iron (black), and other materials, is then applied to a base object made of wood or cloth. Using either a spatula or a brush, the lacquer craftsman applies the lacquer in thin layers, gradually building up the highly lustrous and durable surface.

The earliest lacquer object so far discovered is a rather crude, heavy wooden bowl from the Neolithic village site of Hemudu, along the lower reaches of the Yangzi River in east central China. Archaeological excavations have shown that lacquer was used to decorate chariot hardware and also to cover tomb walls in the Shang culture, although actual specimens have not been well preserved. In ancient China, lacquer production reached its artistic peak during the Warring States period (ca. 450-221 BCE) of the Eastern Zhou dynasty and during the subsequent Qin and Han dynasties. Some of the most fantastic lacquerware from ancient China came from the Chu culture, which flourished in southern Henan, Hubei, Hunan, and Anhui provinces during the mid-to-late first millennium BC. Because many Chu sites and tombs are waterlogged, their preservation in many cases is excellent, and the wide variety and artistic merit of their lacquerware can be fully appreciated. In many cases, the wooden coffins were painted with red and black lacquer, as were stringed musical instruments and drums, armor and shields, ferocious-looking monsters that served as tomb guardian figures, boxes, picnic sets, and vessels for holding and serving food and drinks.

The lacquer cup included in this kit is a copy of a Chu specimen dating from the late first millennium BCE. It is called an “er bei,” or “ear cup,” because the two side handles resemble ears on someone’s head. This shallow cup or bowl would be used for drinking wine or other beverages, either at banquets or during ritual ceremonies.
JADE CARVING

“Jade” is a general term for a variety of semi-precious minerals, most notably nephrite and jadeite. In ancient China, jade was carved as early as the Neolithic period, most notably in the Hongshan culture of northeast China (ca. 5th to 4th millennia BCE) and in the Liangzhu culture of east-central China (ca. 3rd millennium BCE). Jade is generally considered an elite luxury good, and was probably associated with ritual activity in some way. Beginning at least in the mid-first millennium BCE (and perhaps earlier), it was believed that jade could help to confer immortality, and that the inclusion of jade in a tomb would prevent the body of the deceased from decomposing. Often jade carvings were inserted on the eyes and into the nostrils, mouth, and other bodily openings to help prevent this decomposition after death. In extreme cases, entire “suits” of jade made of thousands of jade pieces stitched together, were produced to hold the body of the deceased.

Jade is considered an “elite” item in ancient China. That is, the inclusion of jades in a grave suggest that the deceased person held a powerful political or religious position in that society. The reasons for this interpretation include:

(1) Jade deposits are not evenly distributed in East Asia, and in many cases, jade was transported from very distant sources in western China or Central Asia. Therefore, the inclusion of jade objects in a grave suggests involvement in or even control over long-distance trade contacts and means of transport.

(2) Jade is an extremely tough mineral, and cannot be “cut” by copper, bronze, or even iron tools available in ancient times. Instead, jade carving requires a very labor-intensive process of grinding down the jade using abrasive sands, using oil or other sticky material to help the abrasive sands stick to the cutting tool. We know from traditional jade workshops that it can take many months to create a single jade carving, so the inclusion of jades (and in some cases, dozens or even hundreds of jades!) in a tomb suggests that the tomb occupant had at his or her disposal the necessary skilled workers to create the objects.

(3) In some cases, large quantities of carved jades were included in the graves of children. This suggests that those children were members of powerful families in order to merit such lavish treatment after death. Given their young age, it is highly unlikely that their position was “earned” through his or her own deeds.

The jade included in this kit is a reproduction of one of the more than 750 jades found in the tomb of Fu Hao, who was one of the wives of the late Shang king Wu Ding. In addition to being a powerful wife of the king, we believe that Fu Hao was also a military commander. In addition to the jades, her tomb, excavated in 1976, also contained 450 bronzes, 560 bone artifacts, 6,900 cowrie shells, and 16 human sacrificial victims. It is the only “royal” tomb of the Shang culture that had not been looted prior to being archaeologically excavated.
**BRONZE METALLURGY**

Bronze is a mixture, or alloy, of copper, tin, and lead. While its origins are unknown, we do know that in ancient China, bronze production increased about 2500 BCE for the making of knives, bells, and other small objects. By about 1800 BCE, it had become a very important material for the production of weapons and ritual vessels, examples of which have been found among the archaeological remains of the Erlitou culture. In ancient China, a sophisticated piece-mold made of clay was used in order to cast both simple and complex objects. During the Shang dynasty (ca. 1500 to 1100 BCE), both the quantity and quality of ancient Chinese bronze castings were unsurpassed in the ancient world.

The bronze mirror included in this kit, dating from the Han Dynasty (ca. 3rd C. BCE to 3rd C. CE), is an example of a rather simple cast object. Its back is covered with decorations and an inscription wishing for prosperity; its front is highly polished. Mirrors first appear in the early 2nd millennium BC, and might have had a ritual function during shamanistic ceremonies. During later periods, mirrors were widely used for personal use. Other varieties of copper and bronze mirrors can be found in ancient Egypt, the Middle East, and across Central Asia.

The bronze "knife" is actually one of many types of coins circulated during the Warring States period (ca. 450-221 BCE) of the Eastern Zhou dynasty. During the Qin and Han periods, coinage was standardized into the familiar circular shape with a square hole in the middle.

Bronze production required the mining and smelting of various ores that contained the necessary metals copper, tin, and lead. The mineral specimens included in this kit are typical of those mined in ancient times: copper can be obtained from native copper, malachite, and azurite; tin from cassiterite, and lead from galena. With the exception of the native copper, which is fairly pure copper as found, the mining of these ores was followed by crushing and sorting. The metal-rich crushed ore was then smelted in a special furnace, a process that separates the metal from the non-metal parts of the rock. The metal obtained after smelting was then sent to the cities for alloying and casting. All of these minerals are plentiful in central and southwest China, and a lively trade in metals across China was probably taking place as early as the mid-second millennium BCE.
Bamboo Slip Books

Bamboo and wooden slips were used as a writing material at least as early as the Shang dynasty (ca. 1500 BCE) and continued to be a major medium for writing until the appearance of rag paper in the 2nd century CE. The characters were written with a rabbit hair brush and black ink made from pine soot. The individual bamboo strips were tied together by fine string to form the book, which could then be rolled up for easy transport or for storage.

This reproduction of a bamboo slip text is copied after an example from among the 1,155 strips discovered in 1975 in the coffin of a local Qin Dynasty official buried at Shuihudi, in Xiaogan District, Yunmeng County, Hubei province. These texts, which date from the late 3rd century BCE, shed light on details of Qin administration and law.

Translation:
"In the second month of spring one should not venture to cut timber in the forests or block water courses. Except in the months of summer one should not venture to burn weeds to make ashes, to collect [indigo], young animals, eggs or fledglings. One should not...poison fish or tortoises or arrange pitfalls and nets. By the seventh month (these prohibitions) are lifted. Only when someone has unfortunately died and one fells (wood for) the inner and outer coffins, this is not done to the seasons. In settlements close to corrals and other forbidden parks, in the season of young animals one should not venture to take dogs to go hunting. When dogs of the common people enter forbidden parks without pursuing and catching animals, one should not venture to kill them; those which pursue as well as catch animals are to be killed. Dogs killed by the wardens are to be completely handed over to the authorities; of those that are killed in other forbidden parks the flesh may be eaten, but the skin is to be handed over."

— Statutes on Agriculture

DOMESTICATED GRAINS

Agriculture appears in ancient China during the early Neolithic period about 7000 BCE, although future archaeological evidence might push this date back even earlier. During the Neolithic and Bronze Age periods, the most important domesticated grain in north China was millet (and later, the addition of sorghum and wheat), while the dominant crop in south China was rice. There is still much debate about the origins of these domesticated crops: were they “discovered” independently in China, or were they introduced from other ancient cultures?

MILLET: More than 6000 varieties of millet exist around the world, and it is an important crop because it can thrive in dry, hot climates and poor soils where many other crops cannot survive. The two earliest domesticated varieties in China were foxtail millet (Setaria italica) and broomcorn millet (Panicum miliaceum). Millet, which contains more calories than wheat and is rich in B vitamins, potassium, phosphorus, magnesium, iron, zinc, and other minerals as well as protein, can be ground into flour and used to bake breads or for noodles. It is also commonly boiled whole as a porridge, and it can be fermented into an alcoholic beverage.

SORGHUM: Like millet, sorghum can thrive in harsh environments. It is still debated whether sorghum, or gaoliang, was domesticated in ancient China, but it certainly becomes an important commercial crop during the first millennium CE, possibly via coastal trade with India and Southeast Asia or across Central Asia. In addition to being an important source of starch, for many centuries sorghum has been fermented to create a powerful alcoholic beverage in China, perhaps best known under its “brand name” Maotai, and it is quite likely that similar alcoholic beverages were produced for ritual and other court activities in ancient China.

RICE: The Asian cultigen of rice, Oryza sativa, was the most important grain crop of south China, and continues to play this dominant role today across East Asia. It possibly developed out of wild progenitors in northern India or southeast Asia, or perhaps in south China itself. The archaeological investigation of early rice is constantly pushing back the date of initial domestication, with a number of sites in the Yangzi River valley now showing rice remains earlier than 6000 BCE. In addition to its use as a food, rice was likely fermented to produce alcoholic beverages.

A range of essays on early Chinese agriculture and cuisine can be found in K.C. Chang, Food in Chinese Culture (New Haven: Yale University Press, 1977).
**Bronze Bell Music (Audio CD)**

We know that musical instruments were produced in ancient China as early as about 7000 BCE. A number of bone flutes, made from the long bones of a crane, have been excavated from sites of the Peiligang Culture in the North China Plain. During the later Neolithic period, musical instruments found in archaeological excavations include pottery drums and whistles, chime-stones, and small bronze bells. During the Bronze Age, a wide variety of musical instruments were produced in different materials: lacquered zithers and other stringed instruments; lacquer-and-skin drums; bronze bells, drums, *chunyu* bells, and *sheng* mouth organs, to name a few.

By the Shang dynasty (ca. 1500-1100 BCE), bronze bells and drums were produced in increasing quantity and probably reflect the growing importance of music in ritual activities, court ceremonies, and banquets. By the Zhou period, strictly regulated court music was played on huge arrays of bronze bells, hanging stone chimes, and a variety of drums, but new regional types of music— which Confucius complained about as “corrupt” music— were also developing at that time.

In 1978, archaeologists unearthed the tomb of Marquis Yi at Leigudun in Hubei province, dating from the late-5th century BCE. The discovery of this multi-chambered tomb was momentous for many reasons: its excellent state of preservation, its huge quantity of bronzes (some ten tons in weight), and its wide variety of musical instruments that indicate the power and prestige of the his state of Zeng, which was only a minor ally of the much larger and more powerful southern state of Chu. Sharing certain features with its Chu neighbors, the tomb of Marquis Yi contained many stringed zithers made of lacquered wood; lacquered wooden drums mounted on tall bronze-based stands; a set of 32 chime-stones suspended on a bronze rack (these produce sounds similar to a xylophone); and the largest set of bronze bells ever found in an ancient Chinese tomb. Shown in the photo above, the set of 65 bells were suspended on an L-shaped three-tier rack; the largest bell in the center of the lower set contains an inscription indicating that it was a gift to the Marquis from King Xiang of Chu in 433 BCE. The bells are of the bianzhong variety: ranging in size from 2 kg. to 203 kg, each has an elliptical cross-section that produces two different tones, depending upon whether it is struck along its long or short axis. The upper register bells produce a clear ring; the lower-register bells produce a deep, resonating sound. With a range of five octaves and a chromatic scale, the bianzhong are capable of playing polyphonic music and music which changes key.

The audio CD in this kit provides a sense of the type of music that might have been played on these Bronze Age instruments, and gives us an understanding of the outstanding craftsmanship that went into their production. Excellent surveys of music in ancient China include Lothar von Falkenhausen, *Suspected Music: Chime-Bells in the Culture of Bronze Age China* (Berkeley: University of California Press, 1993), and Jenny F. So (ed.), *Music in the Age of Confucius* (Washington, D.C. : Freer Gallery of Art and Arthur M. Sackler Gallery, Smithsonian Institution, 2000).
Oracle Bones

Oracle bones were used in ancient China for divination so that future events could be foretold. The most common animal bones used for this practice were the scapula (or shoulder blade) of deer or cattle, and the plastron (lower shell) of turtles. These were burned in order to produce cracks, which the king or shaman or other specialist could "read" in order to get an answer to a question. Archaeological evidence shows that burned bones were probably used for divination as early as about 5000 BCE during the Neolithic culture in northeast China. They also appear during the late Neolithic cultures, and in the Erlitou culture, and especially during the Shang dynasty (ca. 1500-1100 BCE).

The bones were prepared by scraping off protuberances in order to have a fairly flat surface. A series of shallow grooves were carved or drilled in the back side of the bone to thin the bone, but these grooves do not go all the way through. Heat was then applied to each groove, perhaps using a burning stick or heated bronze rod; this burned the bone and caused a right angle crack to appear on the front surface of the bone. The cracks were then somehow "read" by the diviner in order to get an affirmative or negative answer to the question asked.

The most famous oracle bones are those produced during the late Shang period (about 1300-1100 BCE). We know that Shang kings relied on oracle bones in order to communicate with their ancestors, who provided answers to their questions. Burned scapulae and plastrons have been found at earlier Shang sites such as Zhengzhou, but those found at the late Shang site near Anyang are of the greatest importance because many of them bear inscriptions detailing the day the divination took place, the name of the diviner, the question asked, and (in some cases), even the outcome of the event! The questions range from rather mundane topics about agriculture and weather ("Will it rain in the next three days?") to detailed questions about required sacrifices of jade or cattle, about royal hunts, and about military campaigns against their neighbors. These inscriptions give us many details about the Shang that we would not be able to know otherwise, such as their concerns about various rituals, the names of their rulers and neighbors, the names of various cities and states, and the everyday concerns of the royal court.

Excellent introductory information about Shang oracle bones can be found in David N. Keightley, Sources of Shang History (Berkeley: Univ. of California Press, 1978).
SILK / SERICULTURE

The weaving of fabrics dates back to the Neolithic period in ancient China. Using early hand spindles and back-strap looms, a variety of plant fibers (such as hemp and ramie) and animal fibers were used to produce textiles for clothing and for other uses. Perhaps the most important fabric — and one of China's many inventions that spread the world over — was silk, and sericulture (the production of raw silk by raising silkworms) played a vital role in the lives of the elite and in China's economy and trade with other cultures.

Silk is the thread of the cocoon of the silkworm, *Bombyx mori*. The silkworm larva hatches from tiny black eggs. The larva then feeds constantly on the leaves of the mulberry tree (*Morus alba*) for about six weeks, growing to about 3 inches long. The white caterpillar then pupates, spinning a white cocoon around itself. It emerges as an adult moth in about three weeks; the moth reproduces and dies within about five days.

Each cocoon contains about 1000 yards of silk strands, and about 300 cocoons are needed to make just one pound of silk. The cocoons are boiled in water to loosen the strands, which are gently "unwound" from the cocoon and then joined with several other strands to make silk thread. The silk threads are then woven into fabric.

There are a number of legendary accounts describing the invention of silk in ancient China, but according to archaeological evidence, sericulture probably began during the middle Neolithic period, possibly as early as 4000 BCE. Some depictions of worms on pottery of the Hemudu Culture have been identified as silkworms, and actual silk fabrics have been found at later Neolithic sites in Zhejiang and other areas. During the Shang dynasty, silk was produced for clothing, and incredibly fine embroidered silks were produced during the Eastern Zhou through Han periods (ca. 450 BCE to 220 CE).

The silk scarf included in this kit is an example of a rather mediocre quality fabric meant to give your students a sense of the strength and texture of silk. Many ancient silks were much finer than this example!

Classroom activities concerning silkworms and silk production can be found at the following web sites: