PART 1: SETTING THE SCENE

THE STATUS OF CERAMICS IN EARLY CHINA

The main subject of this book, as part of the series concerned with a scientific record of China, is the history of Chinese ceramic technology. That topic alone is extraordinarily rich, for China can evidence 11,000 continuous years of ceramic manufacture, utilising copious natural resources to achieve consummate technical successes. Broad issues pertaining to ceramic materials and processes will be introduced in this opening section of the volume. Prefacing those themes, however, will be a review of the manner in which effective political and economic organisation contributed to production at various levels in the community. For while ceramics were not always pre-eminent materials for ritual and status, they maintained an important role in Chinese society. They were utilised for medicinal and culinary purposes, extolled as objects of aesthetic refinement by scholars, mass-produced for export, and subjected to official control for burial, religious ritual and imperial household functions.

One route to knowledge is through consultation of historical texts. They provide only a partial view of the subject, and can be supplemented by commentary and research conducted by modern scholars, in both textual and archaeological fields. In Part 1 these types of research material are employed to sketch a background to the story of Chinese ceramics, starting with consideration of the status of pottery at the very dawn of history.

Palaeolithic and Neolithic Periods

In the period *c.* –9,000 to –4,000, carbon-dated sites of Phei-li-kang 裴李崗 and Hsin-cheng 新鄭 in Honan province 河南省, Tzhu-shan 磁山 in Hopei province 河北省, Tseng-phi-yen 甑皮岩 in Kuangsi province 廣西省 and Hsien-jen-tung 仙人洞 in Chiangsi province 江西省, show evidence of pottery production.[1] Consideration of just one of these early ceramic-yielding sites offers some interesting pointers to later developments. The cave site called Hsien-jen-tung, or 'Spirit Cave', lies in the Wan-nien 萬年 district of north-eastern Chiangsi province. The cave was formed in a limestone cliff, and held three layers of deposition, the last of which contained the debris of human occupation. First investigated in +1962, the site has been the focus of several archaeological reports,[2] and has recently been the subject of extensive re-examination as part of a joint project between Chinese and American archaeologists. The Sino-American team affirmed that the time horizons for the whole site were –9,000 to –4,000, and that pottery recovered from the site

[1] Feng Hsien-Ming *et al.* (1982), pp. 1–5.
[2] Chang Kwang-Chih (1963, 1986), p. 100 and note 89.

used clay from a common source. The pots from all strata were formed by hand, using coiling, thinning and smoothing processes, with cording, stamping and piercing for decoration. A tentative sequence of pottery types has been established, the ceramics of some phases of the sequence containing both fine and coarse. Pottery of both types was placed in tombs situated in the communal burial ground to the north of the settlement; it is noticeable that few graves held fine types. For example, the earliest ceramic phase of *c.* –9,000, called by the archaeologists 'Hsien ware' 仙窯, was tempered with crushed white quartzite rock whose mineral-grains acted as a temper, ranging as they did from coarse to very coarse. Other ceramics later in the sequence were tempered using added, crushed pottery sherds, while a third type was shell-tempered.[3]

A point of interest is the presence of both fine and coarse wares in the same phases of occupation. Unfortunately the sherds from the very earliest phases of Hsien-jen-tung are too small to permit reconstruction of whole vessel-types, and the cave dwelling site does not encourage the re-creation of socio-cultural ritual. Nevertheless, there are two ways in which one may interpret the presence of fine and coarse ceramics. The first implies hierarchical division, with richer or more powerful members of clans owning finer pots and those of low status possessing coarse wares. The second interpretation implies the use of fine wares for ritual and ceremonial, and coarse wares for domestic purposes. Both interpretations must be conjectural, but in the light of evidence from the later Neolithic, the latter view seems more plausible.

Gina Barnes has rehearsed the different ways in which +20th-century archaeologists define the concept 'neolithic': in terms of material technology; by reference to social organisation; or by varying combinations of the two.[4] For China, it is often understood as the time at which peoples turned away from hunter-gathering, and established settled agricultural communities. This happened at different periods in different regions of China, starting around –9,000 to –7,000.[5] The range of ceramic types produced over this vast area and enormous time-span was very varied, and the evolving technologies of forming and firing were significant.

The definition just given of the Neolithic in China invites several problems, however. Archaeology has revealed the presence of sets of grouped sites (termed by the Chinese 'cultures') that post-date the last period of glaciation in China, variously dated to between –13,000 and –10,000.[6] These cultures belong to what K. C. Chang has called 'two ill-defined but clearly recognisable segments', i.e. those largely without ceramics, and those producing pottery. To complicate matters further, some of the earliest pottery-producing cultures were known to be agricultural, while others were not.[7]

[3] Hill (1995), pp. 35–45.
[4] Barnes (1993), pp. 16–18.
[5] Three maps from K. C. Chang's seminal book *The Archaeology of Ancient China* illustrate how several centres of activity developed and interconnected over four millennia. Chang Kwang-Chih (1963, 1986), p. 235.
[6] *Ibid.*, p. 71.
[7] *Ibid.*, p. 81.

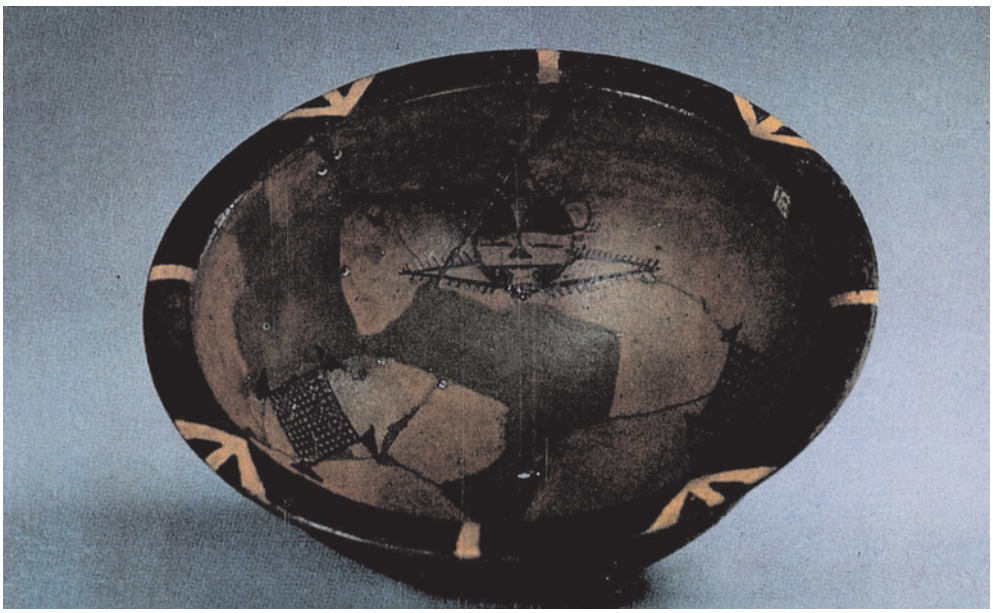

Fig. 1 Pan-pho fine ware

Material from the middle Neolithic period in China is more abundant. A well-known site from this phase is Pan-pho 半坡 in Shensi province 陕西省, tentatively dated to –5,000 to –4,000.[8] The Pan-pho Neolithic village was built within a large moated clearing on the second terrace of the east bank of the Chhan river 滻河, some six kilometres east of present-day Sian 西安 city. The district is now largely treeless loess, but in its time grassland, marshes and dense virgin forest surrounded the Neolithic village and its fields. People of the Yang-shao culture 仰韶文化 at Pan-pho grew millet and Chinese cabbage, kept pigs, fished with barbed hooks and nets in the nearby river and lakes, hunted game (particularly banded deer), and gathered foods such as pine-nuts, chestnuts and snails. This took place in a warmer (perhaps +4°C) and wetter environment than exists in Shensi today. The substantial and ditch-protected village covered about 50,000 square metres, of which some 10,000 square metres have now been excavated. The site was discovered in +1953 and has since seen five systematic campaigns of excavation, and the building of a large roof to protect the dozens of hut foundations, storage pits and kilns discovered. Foundations for 46 houses (some semi-subterranean), two pigsties, more than 200 storage pits, six kilns and some 200 tombs have been found to date. Germane to the discussion are the large numbers of sherds that have been recovered, and the

[8] *Ibid.*, p. 111.

Fig. 2 Pan-pho coarse ware

presence of reconstructed whole ceramic vessels. From these artefacts it is immediately apparent that two categories of ceramics were made, those for everyday use and those for special feasting or ritual occasions.[9]

Areas of the village were reserved for pottery-making, the products including red or grey, thick-walled amphorae with pointed bases, *ting* 鼎 cooking tripods, wide-bellied storage jars with narrow necks, and a variety of basins, bowls, cups and

[9] In addition to fine vessels for use in life, distinctive sets of ceramics were already made for burial, that were smaller and not so fine. This creation of burial items (now termed in Chinese *ming-chhi* 明器) set a pattern that was to continue throughout Chinese history.

pouring vessels. These were made from both coarse and relatively fine pottery, some of which is recorded as being tempered with mica or sand, and some with shell.[10] A quite distinct group of artefacts was characterised by a fine, burnished red body, a coiled and paddled method of construction,[11] and decoration with red, white and black pigments (see also Parts 4 and 6 of this volume). Pottery of both types was placed in tombs situated in the communal burial ground to the north of the settlement; it is noticeable that few graves contained either tools or weapons.[12] A special ceremonial use of large, red-bodied, painted jars was to contain the remains of children or teenagers who had died young, the jars then being buried in the vicinity of houses.

The Hung-shan 紅山 and related Neolithic cultures in north-east China throw up yet more interesting contexts for the use of pottery. The site of Niu-ho-liang 牛河梁 in Liaoning province 遼寧省 has been carbon-14 dated to around –3,000.[13] In addition to cairn burials and houses, archaeologists also unearthed the remains of a large, subterranean building measuring about 25 by 9 metres. It was divided into several chambers, and its surface layers yielded fragments of big pottery figures of animals and humans. The human figures were life-sized, with ears of twice life-size. A famous piece is the model of a complete human head, with eyes inlaid with blue-green jade pieces for verisimilitude.[14]

Such figures, found at several Hung-shan sites, have been characterised as statues of deities, and Chinese archaeologists call the large building at Niu-ho-liang the 'Goddess Temple'.[15] In addition to pottery figures, fine black-painted red ceramic vessels were made, which has suggested a link between the Neolithic cultures of north-east China, and phases of the Yang-shao culture of central China. One strange and unexplained fact was that the Hung-shan grave pottery was constructed without bottoms, indicating a deliberately ceremonial function.[16]

Feasting, and the provision of banquets for both the living and the dead, have continued as an important ritual in Chinese life down to modern times. Jessica Rawson conjectures that the preparation of ritual meals for the deceased was probably in use by the Neolithic, using as demonstration fine ceramics buried in large numbers in Ta-wen-khou 大汶口 culture tombs, around –3,000 and earlier. Such tombs, located in Shantung province 山東省, contained sets of between six and twenty elegant, burnished cups on tall feet, that were placed on, in and around coffins.

[10] The exhibits are so-labelled in Pan-pho museum, but so far no published analytical research confirms the question of temper.
[11] Cf. Yang-shao ceramics of Pan-shan 半山 type from eastern Kansu province 甘肅省, examined for their construction by optical microscopy and xeroradiography by Vandiver (1988 and 1989b), and the discussion of her findings on pp. 382–8 of this book.
[12] Chao Wen-I & Sung Pheng (1994), pp. 45–6, 86.
[13] Nelson (1995), p. 28.
[14] *Ibid.*, pp. 38–9.
[15] Anon. (1986c), pp. 1–17.
[16] Nelson (1995), p. 21.

Fig. 3 Model of a human head from Niu-ho-liang

Rawson suggests that these indicate the ritual offering of wine in fine ritual vessels, along with food, by the living to their dead relatives.[17]

This very brief survey of three Neolithic cultures suggests what more detailed studies have confirmed, namely that in the Neolithic period status materials comprised stone (particularly jade), shells (which were often used as currency) and certain types of fine ceramic. What we cannot determine is the relative status enjoyed by cloth and clothing. Numerous finds of pottery and bone spindle-whorls, the excavation of woven silk fragments[18] and multiple impressions of woven cloth left in the clay of ceramic vessels, suggest that textile technology was relatively advanced in the Neolithic.[19] What we know about Chinese textiles and fashion in later periods (and indeed, what we may infer from our own cultural experiences, where textiles and fashion play a dominant role), suggests that cloth may have enjoyed high status in ancient China.

Bronze Age

The notion of a 'Bronze Age' is a modern concept, and although it is accepted by +20th- to 21st-century historians and archaeologists in China, it is commonplace for them to refer to ancient history in dynastic terms. Many experts accept the existence of three phases: the Hsia dynasty 夏代 (traditional dates –21st to –16th centuries), the Shang dynasty 商代 (*c.* –16th century to *c.* –1,050) and the Chou dynasty 周代 (*c.* –1,050 to –221).[20] The advent of the Bronze Age brought two, new important cultural components. The first was the widespread use of metal for high-status objects, such as ceremonial and feasting vessels; the second, the promulgation of written texts, in which information on material culture and its accoutrements were recorded.

So far as the archaeological record is concerned, some of the earliest bronze vessels so far discovered come from the site of Erh-li-thou 二里頭 in Honan province, dating to about –2,000 to –1,500.[21] Some Chinese archaeologists assign this site to the Hsia dynasty, and quantities of fine ceramics have also been excavated there, whose forms relate to metal.[22] Indeed, at both this and at subsequent mid and late Shang dynasty sites such as Cheng-chou 鄭州 and An-yang 安陽 in Honan province, two common bronze forms have been shown to depend on earlier ceramics: tripods and vessels with high, circular ring feet. Robert Bagley has characterised the relationship thus:[23]

[17] Rawson (1999), p. 41.
[18] Wilson (1993), p. 133.
[19] See Kuhn (1988), pp. 61, 90–141, 157.
[20] The Hsia dynasty is still in contention; some scholars accept its historicity and others do not.
[21] Rawson (1980), p. 42; Barnes (1993), p. 119.
[22] See Anon. (1974a), pp. 234–48, pls. 2–5.
[23] Bagley (1987), pp. 24–5.

these shapes cannot be said to owe much to the founder's technique, for they were mostly inherited from an earlier stage . . . These distinctive pottery shapes came ultimately from the very ancient Neolithic tradition of the east coast, where . . . the wonderfully impractical shapes of pottery vessels deposited in (the same) graves hint at a ritual purpose similar to that served by the bronzes.

In addition to form, ceramics can also be ranked in terms of their body-material. During the late Shang dynasty a fine, white-bodied ceramic appeared; this was a royal ware, and its manufacture was carried out at the capital, An-yang, a city that flourished between about –1,300 and –1,050. The body-material of these wares, somewhere mid-way between a fine white stoneware and a porcelain, has been shown through analysis to be made from lower-grade secondary kaolins, fired to the 1,050°C to 1,150°C temperature range.[24] Their composition suggests that the raw material came from similar sources as later high-fired, glazed whitewares such as those from Kung-hsien 鞏縣 in Honan province.[25] The form and decoration of Shang dynasty whitewares were refined and closely related to bronze ritual vessels (see also pp. 102–3, 114).

Excavations at many Bronze Age city sites revealed designated areas of workshops dedicated to the manufacture of pottery.[26] For example, at Cheng-chou separate workshops for ceramics, bronze-casting and bone-carving were situated outside the city wall, with fourteen kilns to the south-east of the site and a clay preparation area to the west.[27] This supports textual information that ceramic manufacture was a recognised profession, practised by skilled craftsmen.

Archaeology has also indicated that during the high Bronze Age, i.e. the Shang and early Western Chou periods, status materials comprised jade, horn, ivory, stone, lacquer, textiles and bronze. Jessica Rawson has pointed out that ceremonial vessels were cast in bronze, and that ceramic was only used for the manufacture of cheaper imitations sets for burial.[28] She has also drawn attention to a curious and sweeping change that took place at the end of the middle Western Chou period (–9th century), when a suggested revision to ritual practice led to the abandonment of old vessel types, and the adoption of new forms based on ceramic vessels.[29] The unusual nature of this reversion, to the copying of a cheap material (ceramic) in a costly material (bronze), is noteworthy. It is perhaps worth considering what types of pottery were available to consumers at that time, and attempting to severalise different qualities of ceramic. But first ceramic types themselves should be distinguished one from another.

[24] Sundius (1959), pp. 107–23.
[25] Wood (1992), p. 147.
[26] Chang Kwang-Chih (1963, 1986), pp. 362–3. For Cheng-chou, see An Chin-Huai (1960), p. 70.
[27] Treistman (1972), p. 77.
[28] Rawson (1990), p. 108 and note 206.
[29] *Ibid.*, pp. 108–9.

CERAMIC TYPES AND CHINESE TERMS

In the modern English language, ceramics can be categorised by their body-material as earthenware, stoneware or porcelain. Porcelain has been described as:[30]

> A vitrified, white and translucent ware . . . that is fired at 1,300°C plus. The name porcelain is said to have been coined by Marco Polo in the 13th century from *porcelino*. This was the name of the translucent cowrie shell which looked like a little pig or porcelino. He likened Chinese porcelain to this translucent white shell.

In fact, Chinese porcelain may not necessarily be either white or translucent. Porcelain stones and clays can contain impurities such as iron oxide, which discolour them to brown or grey or yellow in their raw state, and cause a grey tone after firing. Moreover, if an object is thickly potted it will not conduct light through its walls. Even the firing temperature varies in the range 1,150–1,400°C (see pp. 55–60).

Stoneware has been characterised as a hard, strong and vitrified ware, fired above 1,200°C, in which the body and glaze mature to form an integrated body-glaze layer.[31] Earthenware has been characterised as having a porous body that can be waterproofed by glaze, and the simplest distinction between stoneware and earthenware as being:[32]

> the porosity of the body. If the fired body has a porosity of more than 5%, then it is earthenware. Many potters add to this criterion of porosity a consideration of the temperature at which the glaze is fixed. The softer temperatures below 1,100°C . . . are associated with earthenware glazes . . .

If this terminology of earthenware, stoneware and porcelain is accepted, then in broad terms the history of China's earthenware begins in the Palaeolithic, of stoneware early in the Bronze Age, and of porcelain in the late +6th century. There are two problems, however, in the distinctions outlined above. The first is a technological consideration, the second a linguistic dilemma.

In the first place, many stonewares in China (particularly in the north) fall into the 'earthenware' porosity range, because of the refractoriness of their raw materials.[33] For most (but not all) Chinese wares the deciding difference between earthenware and stoneware can only be marked by the significant development of *mullite* crystals in their ceramic body (a full discussion of the development of mullite is on p. 59). This is a factor that can only be determined by microscopy, and not by the naked eye.

[30] Hamer & Hamer (1975), p. 229.
[31] *Ibid.*, p. 285.
[32] *Ibid.*, p. 111.
[33] Porosity is a vague term if a distinction is not made between 'open' and 'closed' porosity (also called 'apparent' and 'true' porosity). Many Chinese stonewares have percentage water absorption greater than 5%: for example, Ju ware 汝窯 19.3%; Chün ware 鈞窯 10.7%; Lin-ju wares 臨汝窯 up to 8%. A full account of standard industrial ceramic investigation into Chinese ceramics, including porosity, is detailed in Palmgren, Sundius & Steger (1963), pp. 452–75.

Fig. 4 Porcelain clays at Ching-te-chen (+1982) to show the range of colours