

CAMBRIDGE MANUALS IN ARCHAEOLOGY

Pottery in archaeology



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POTTERY IN ARCHAEOLOGY

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HISTORY OF POTTERY STUDIES

Introduction

Pottery tends to arouse strong emotions in archaeologists: they either love it or hate it. For some it has an indefinable fascination, and is potentially full of information, which has to be teased out of it by careful and painstaking study. At the other end of the scale, it is seen as the most common of archaeological materials, whose main functions are to slow down the real business of digging, fill up stores, and behave as an archaeological 'black hole' for post-excavation resources. Between these extremes there is a whole spectrum of opinion: some, for example, see pottery as an unavoidable chore, a material to be processed as quickly as possible before being reburied (either in the ground or in a store), a bit like low-level nuclear waste. A sign on a door in a museum 'Danger: pottery processing' satirised this view. Others take a more mystical view, believing the humblest sherd to be full of the most amazing information – 'Show them a piece of worn pottery and it's the rim of a centurion's favourite cup' (read in a local newspaper) – which only the pottery specialist, as some sort of *guru*, can unlock.

There is an element of truth and an element of caricature in each of these descriptions. While it will be clear where our feelings lie, our aim in this book is to take a balanced view of the potential contribution of pottery studies to archaeology, neither too optimistic nor too pessimistic. To do this, we first need to look at the history of our subject, on the grounds, familiar to archaeologists, that to understand the present we first need to study the past. It is natural for archaeologists to attempt to divide their material into chronological phases; the history of archaeology in general, and of ceramic studies in particular, is no exception. Shepard (1956, 3) saw three phases: (i) the study of whole vessels as culture-objects; (ii) the study of sherds as dating evidence for stratigraphic sequences; and (iii) the study of pottery technology as a way of relating more closely to the potter; but she did not try to put dates to them. Matson (1984, 30) applied two of Willey and Sabloff's (1974) phases – the Classificatory-Historical Period (1914–60) and the Explanatory Period (1960 onwards) – to American ceramic studies. Van der Leeuw (1984, 710–18) saw three phases: the typological (up to 1965), the 'three levels of research' (1965–80, continuing the previous tradition, with a 'micro' level below it and a 'macro' level above it) and the 'study of the cultural element' (1980 onwards).

Here we attempt to draw together these views by setting the history of ceramic studies into three broad phases: (i) the art-historical, (ii) the typological, and (iii) the contextual, admitting that the last is characterised mainly by its diversity of approach, encompassing studies of technology, ethnoarchaeology, questions of style and problems of change (or the lack of it) in ceramics, all approached from widely-differing viewpoints. These phases can be seen to move in step with changes in the scale at which pottery is studied, from whole pots (art-historical) to sherds (typological) to a whole range of scales, from the microscopic detail of fabric to the inter-comparison of whole assemblages, not just of ceramics but of all artefacts (contextual). The splendid but elusive term 'ceramic ecology' was coined (Matson 1965, 202) to describe this holistic cradle-to-grave (or dust-to-dust, see van der Leeuw 1984, 707) approach to pottery. In our view, progress since then has been uneven, with study at the broadest level (the assemblage) lagging behind progress at other levels, partly due to the lack of the necessary methodological tools; one purpose of this book is to try to redress the balance.

We do not try to impose a rigid 'Three-Age system', like a latter-day Thomsen, but see a regional pattern of development, with new ideas being adopted at different times alongside the old ones, which are rarely totally rejected but subsumed into a wider approach. Progress is often patchy, even within a single organisation. In Britain, for example, many field archaeologists seem still to be in the typological phase, demanding 'dates' and little else from their ceramicist colleagues. We are writing this book in the hope that it will be read by at least some of them.

Four related topics have provided inputs into archaeological ceramic studies at various stages of their development – ethnography, technology, archaeometry and quantification. Ethnographic pottery studies, although existing alongside archaeological studies for some time, only 'came in from the cold' when archaeologists moved away from the typological approach and began to look at pottery in a wider context (p. 16). Archaeometry, by contrast, has been able to contribute information at all stages, from technical studies of, for example, Greek figured pottery (p. 18) to the identification of the source of a particular ware (p. 19), to a wide range of scientific techniques aimed at a wide range of questions (p. 18). Quantification has been something of a poor relation in this family. While acknowledging, at least implicitly, the need to quantify assemblages before they can be properly compared (for example for seriation or for distributional studies), archaeologists have often failed to grasp the theoretical issues that lie behind the debate over the choice of a measure of ceramic quantity, preferring practical arguments – Is it easy to do? Does it give the answer I want? – and gut feeling. We shall try to make a reasoned assessment (chapter 13.4), bringing in the results of our latest research. The place of each of these topics in the history of ceramic studies is shown in table 1.1, and will be discussed in more detail later

Table 1.1. 1
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Table 1.1. *Summary of main phases and themes in the study of archaeological ceramics*

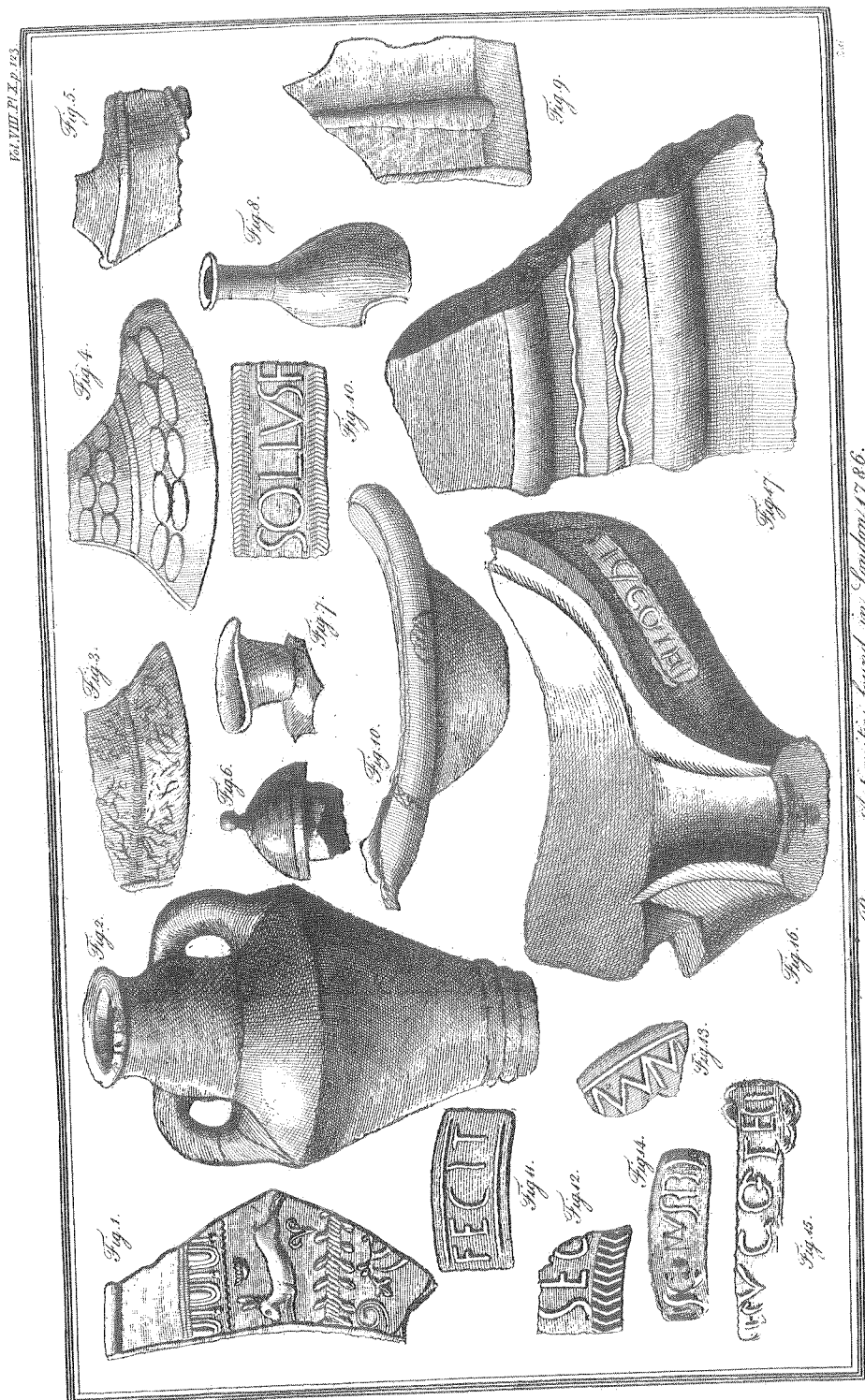
Phase	Art-historical	Typological	Contextual
Date	1500+	1880+	1960+
Scale	whole pots	sherds	microscopic to assemblages
Parallel theme	archaeometry technology	archaeometry quantification technology	archaeometry ethnography quantification technology

in this chapter. Our views on their potential value will be set out in chapter 2.

The art-historical phase

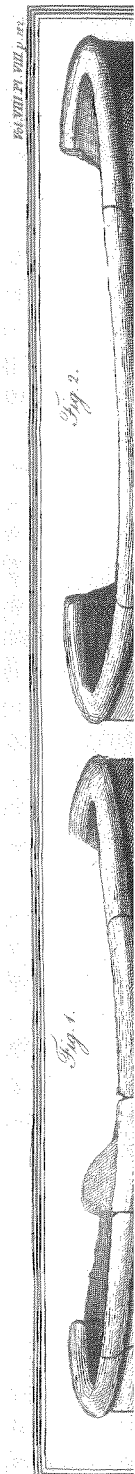
Written evidence of interest in excavated pottery goes back to at least the fifteenth century. Ebendorfer (d. 1464) described prehistoric pots found at Stockerau as man-made objects, countering the common views that they were 'magic crocks' that had grown in the ground or had been made in mines by gnomes (Sklenář 1983, 16). In 1587 Petrus Albinus excavated prehistoric vessels in the Meissen area to gather evidence that they were man-made, and published them in what has been called 'the first proper excavation report in prehistoric archaeology' (Sklenář 1983, 38; referring to Albinus 1589). In 1603 John Stow described pots he had acquired from the Roman cemetery at Spitalfields, London in 1576 (Stow 1603). In the seventeenth century, attention seems to be focussed on burial urns (e.g. Browne 1658; van Mellen 1679), perhaps because of interest in attitudes towards death at various times, rather than in the pottery in its own right. The eighteenth century was the great age of the collector, with Etruscan, Greek and Roman 'vases' coming to the fore. Following an early treatise by Groevius and Gronovius (1694), there were many publications of individual vessels or collections, of which perhaps the grandest was by Hamilton (1766). Emphasis was on admiration of the artistry and techniques of the pottery, and on interpretation of classical scenes.

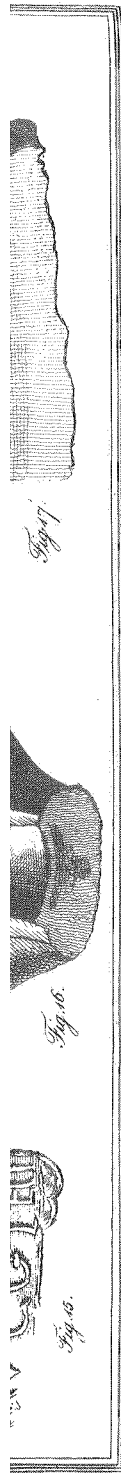
Interest in 'sepulchral' pottery continued through this period (see, for example, Weber 1719; Litzel 1749; Colt Hoare 1812); towards the end of the eighteenth century and more especially in the nineteenth century, it broadened out into a more general interest in pottery of various periods and sources. Local pride seems to have stimulated an early interest in the history of Italian maiolica (Passeri 1752) and in 'gallo-Roman' pottery in France, starting with Grignon (1774) and Grivaux de la Vincelle (1807). In Britain, finds of Roman pottery from London were published in 1787 (Combe and Jackson 1787; see fig. 1.1) and 1832 (Kempe 1832) and from other major



Roman Antiquities found in London 1786.

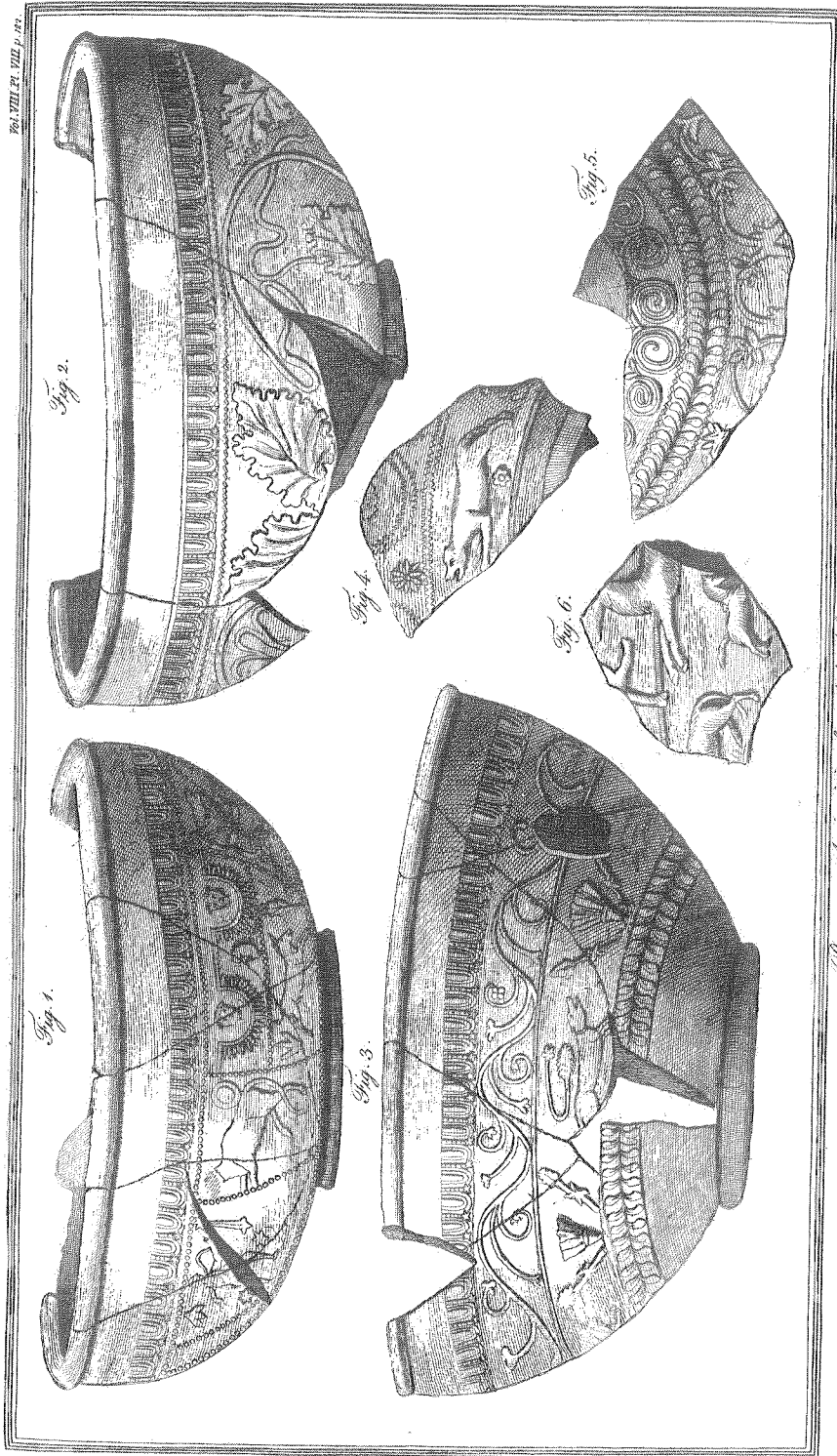
Fig. 1. 1. Examples of early illustrations of excavated pottery (from Combe and Jackson 1787)





Roman, Shitiquities found in London 1786.

Fig. 1.1. Examples of early illustrations of excavated pottery (from Combe and Jackson 1787)



Roman, Shitiquities found in London 1786.

towns from the 1840s onwards (e.g. Shortt 1841) and the same can be said of Germany (Lauchert 1845).

The emphasis was still very much on the 'fine' wares rather than the 'coarse' wares, but as evidence accumulated through the nineteenth century, attempts were made to draw developments together and produce coherent histories (e.g. Birch 1858; Garnier 1880) and popular handbooks (e.g. Binns 1898).

The study of post-classical European domestic ceramics was slower to develop. At first, only decorated medieval floor tiles were thought worthy of attention, for example in England (Hennicker 1796) and France (de Caumont 1850), and as late as 1910 the pottery of the period was thought to have little to offer: 'to the ceramic historian they [the decorative tiles] supplied enlightening evidence that could tell us more about the capabilities of the early potter than any earthen vessel of the same period' (Solon 1910, 602). Early studies of tiles generally referred to a single building, but general histories started to appear in the second half of the nineteenth century (e.g. Amé 1859). Except for German stoneware (see von Hefner and Wolf 1850 for the first illustrations and Dornbusch 1873 for the first serious study), European medieval pottery received relatively little attention until the twentieth century, from the archaeologist Dunning in the 1930s (Hurst 1982) and the art-historian Rackham (1948). Before them, 'early English' pottery usually referred to material suitable for collecting from the seventeenth and eighteenth centuries (see Church 1870), and it was usually regarded as rather quaint in comparison with the dominant position of porcelain (Hobson 1903, xv).

Outside Europe and the Mediterranean, attention was directed to 'Oriental' wares, mainly Chinese and Japanese. After an era of collecting, attempts at historical accounts were provided for China by Julien (1856) and Japan by Noritané (1876-9). An interesting approach to the question of trade in Chinese ceramics was provided by Hirth (1888), who by studying the historical records of Chinese trade dispelled various myths, for example about the origins of Celadon ware.

Study of the early pottery of the United States began in the late eighteenth to mid nineteenth century, often as part of surveys of the monuments and antiquities of particular regions, for example by Squier and Davis (1848), but also in their own right (e.g. Schoolcraft 1847). An advance was marked by the foundation of the Bureau of American Ethnology in 1879 and some particularly valuable work by Holmes (1886). Work in the rest of the Americas progressed in parallel and alongside exploration, for example in Central America (de Waldek 1838) and South America (Falbe 1843).

The typological phase

As excavations in France, Germany and Britain produced ever-increasing amounts of pottery, especially samian wares, pressure for classification must have grown, if only as a means of coping with the sheer quantities involved. A

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very early example is Smith's 'embryonic samian form and figure type-series' (Rhodes 1979, 89, referring to Smith 1854). Coarse wares were also considered at this early date: Cochet (1860) attempted to classify pottery in order to date burials: his work was dismissed because 'the terra-cotta pot ... remains stationary' (Solon 1910, 83). Pottier (1867) made a simple classification of Norman pottery of the thirteenth to fifteenth centuries.

The typological phase can really be said to start in the 1880s, at the same time as Pitt-Rivers was developing his typological approach to other classes of artefact (Pitt-Rivers 1906, based on a lecture of 1874). To come to grips with vast amounts of material from Lezoux, Plique (1887) devised a classificatory system for the pottery, setting a trend for the corpus of samian ware type-series (e.g. Dragendorff 1895; Déchelette 1904; Ludowici 1904; Knorr 1906; Walters 1908) which continues to this day. The other side of the coin – the relationship of pottery to stratigraphic sequences – seems to start at about the same time, for example in Flinders Petrie's work at Lachish, Palestine (Petrie 1891), where he observed Phoenician, Jewish, Greek, Seleucid and Roman pottery in successive strata. The first distribution map of a class of pottery finds appears to be by Abercromby (1904), although a more general map showing find spots of Roman pottery in London had been produced as early as 1841 (Craik, in Knight 1841).

In the United States, this phase can be said to start with Kidder's excavations at Pecos (1915–29) and his integration of stratigraphy, regional survey and ceramics (Kidder 1924; 1931). This work was a model for much that was to follow, through to the 1960s (e.g. Colton 1953; Griffin 1950–4; and many others).

The emphasis in this phase was on vertical (chronological) and regional spatial distributions, with pots (or, more usually, sherds) being treated as type-fossils in a thoroughly geological manner that harked right back to Smith (1816). The vertical emphasis was inevitable, given that pottery was one of the main, and certainly the most abundant, sources of dating evidence, at a time when archaeological attention was focussed on cultural history and development (see for example Wheeler 1954, 40–61; fig. 1.2). The 'horizontal' studies served two purposes:

- (i) to tie together sequences found at related sites in a region to form a master chronological sequence. This would enable any absolute dates determined from one site (for example through inscriptions, documentary evidence, and so on) to be transferred to other sites in the master sequence ('cross-dating', first used by Petrie in the 1880s (Petrie 1904, 141–5)).
- (ii) to help define cultural areas, using the sort of definition provided by Childe ('We find certain types of remains – pots, implements, ornaments, burial rites, house forms – constantly recurring

LAYER	I. STONE AXE	II. MEGALITHIC	III. ANDHRA
1	..	..	52, including 1 yellow-painted sherd
2	..	..	384, including 10 yellow-painted sherds
3	..	..	480, including 68 yellow-painted and 1 rouletted sherd
3a	..	..	67
4	..	36	269, including 51 yellow-painted sherds
5	..	68	219, including 10 yellow-painted sherds ¹
6	26	115	405, including 7 yellow-painted sherds
7	63	407	..
8	150	199 ²	..
8a	36	..	..
8b	89	..	..
9	76	..	..
9a	196	..	..
10	46	..	..
11	33	..	..
12	23	..	..
13	26	..	..
14	48	..	..
14a	15	..	..
15	198	..	..
16	7	..	..
17	45	..	..
18	25	..	..
19	321 ³	..	..

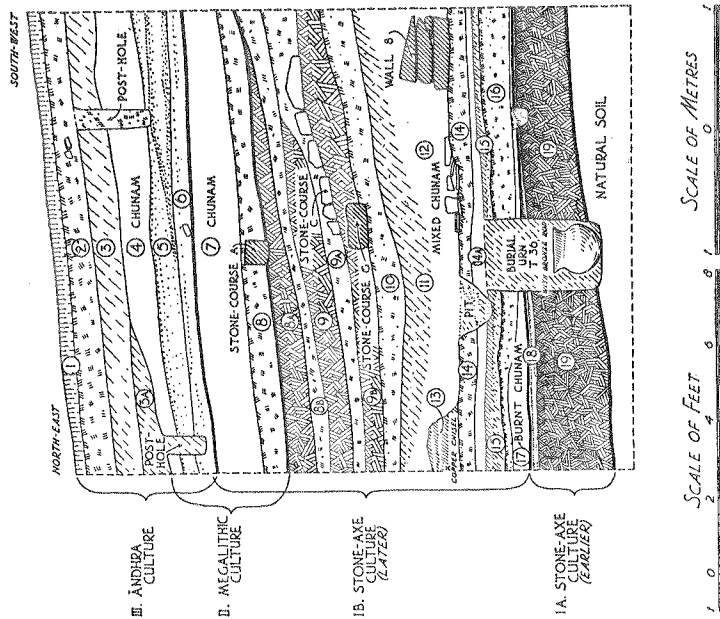


Fig. 1.2. The vertical emphasis of the typological phase. Deep stratification (left) combined with counts of sherds of different types from successive layers. (Wheeler 1954, figs. 9 and 10)

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together. Such a complex of regularly associated traits we shall term a 'cultural group, or just a 'culture'.' (Childe 1929, vi). In Childe's view, many other classes of artefact had to be taken into account, but in practice pottery often had a dominant rôle.

The main methodological tool for the chronological task was seriation (see p. 189). It was created as a way of ordering grave-groups from cemeteries with little or no stratigraphy, using the presence or absence of artefact types in each group (Petrie 1899). The idea that this approach could be applied to surface collections of sherds was suggested by Kroeber (1916) and implemented by Spier (1917). At about the same time (Nelson 1916), it was observed that the proportions of types in successive layers of a stratigraphic sequence tended to follow regular patterns ('percentage stratigraphy'). The idea that such patterns had a cultural interpretation seems to have come later (e.g. Ford and Quimby 1945), and the use of seriation as a formal tool for recreating cultural chronologies from percentage data (usually sherds) in the partial or total absence of stratigraphy followed (e.g. Ritchie and MacNeish 1949, 118), culminating in Ford's manual on the subject (Ford 1962). At this stage, proportions were based on sherd counts; this reflects partly the nature of the collections but partly the lack of serious consideration of the alternatives. Ford (1962, 38) defended the use of sherd counts, dismissing other possible approaches as 'purist'. We shall return to this point when we look at the theme of quantification (p. 21). In Europe, the main use of seriation seems to have continued to be to order grave-groups or other 'closed' groups (e.g. Doran 1971; Goldmann 1972). Theoretical inputs came from Brainerd (1951) and Robinson (1951), followed by Dempsey and Baumhoff (1963), and the theory was integrated by a return to Petrie's work and a mathematical study which showed the equivalence of the two main approaches then in use (Kendall 1971). In the 1970s, attention turned to the appropriateness of the theory for real archaeological problems (Dunnell 1970; Cowgill 1972; McNutt 1973) and the topic was thoroughly reviewed by Marquardt (1978). Both the mathematical aspects (e.g. Laxton 1987; 1993) and the archaeological aspects (e.g. Carver 1985) continued to develop.

But above all, this was the age of the 'type', although the term was given subtly different meanings on each side of the Atlantic. Common to both was a belief that types were more than just a convenient way of sub-dividing material. Once created they could be ordered, according to ideas of 'development', and used to demonstrate chronological sequences. Such arguments could easily become circular, and were gradually replaced as more direct (for example, stratigraphic) evidence became available. In the Americas, the idea that sherds could, and indeed should, be sorted into types, goes back to before 1920 (Kidder and Kidder 1917) and was well-established by the 1930s (Colton and Hargraves 1937). The definition of a type was usually as later

Fig. 1.2. The vertical emphasis of the typological phase. Deep stratification (left) combined with counts of sherds of different types from successive layers. (Wheeler 1954, figs. 9 and 10)

formalised, for example by Gifford (1960, 341), 'a specific kind of pottery embodying a unique combination of recognizably distinct attributes'. As more work was done and more and more types were defined, it became apparent that, although resulting in much economy of thought and presentation (Krieger 1944, 284), a single-tier classificatory system was inadequate (Ford 1954). A two-tier system of 'type' and 'variety' was proposed and widely adopted (Krieger 1944; Gifford 1960), although sometimes with a different nomenclature (Phillips 1958). Above these levels, more theoretical cross-cutting groupings of types (for example sequence, series, ceramic type cluster and ceramic system – see Wheat et al. 1958) were proposed, but were generally more contentious. An alternative approach based on 'modes' was put forward by Rouse (1939; 1960); they were defined as 'either (1) concepts of material, shape or decoration to which the artisan conformed or (2) customary procedures followed in making and using the artefacts' (Rouse 1960, 315). He suggested that an 'analytic' classification, to extract modes from attributes, should precede a 'taxonomic' classification which would define types in terms of modes, not of attributes (pp. 315–16).

In Europe, by contrast, the term 'type' was often used implicitly to mean a form type, and commonly defined in terms of the shape of a 'typical' pot. In other words, types were often defined in terms of their centres rather than their boundaries. This can be linked to the development of modern conventions for drawing pottery (Dragendorff 1895; Günther 1901). A tradition grew up of using an excavator's drawing numbers as 'types', even if the author never claimed them as such. One very widely-used series was Gillam's one of Roman pots from northern Britain (Gillam 1957), which became abused as dating evidence for pots from all over Britain. More recently, a structured approach to types has returned (e.g. Fulford 1975; Lyne and Jefferies 1979).

Despite an early start to the objective description of pottery fabrics (Brongniart 1844) and some early applications (Tite 1848; de la Beche and Reeks 1855), fabric types or wares were generally named by reference to their source (real or supposed), and descriptions were often based on little more than colour, with perhaps a one-word characterisation such as 'coarse', 'fine', 'shelly' or 'vesicular'. The realisation that a single source could produce several different fabrics, possibly differing in date, led to renewed interest in the detail of fabrics, spurred on by Peacock's (1977) guide to characterisation and identification of inclusions using only a low-powered (20×) binocular microscope and simple tools (see Rhodes 1979, 84–7). A further twist to the meaning of 'type' was given by the use of the term '... type ware' to designate a sort of penumbra or fuzzy area of uncertain fabrics grouped around a known ware (for example Whitby-type ware, see Blake and Davey, 1983, 40).

A working typology based at least partly on fabric requires comprehensive descriptive systems. A surprisingly modern one was given by March (1934).

Some aspects of Hargraves' work to this day are still forward from (1973), including not surprisingly a comparable system, we

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Some aspects gave more trouble than others, especially texture (Guthe 1927; Hargraves and Smith 1936; Byers 1937), which has not been entirely resolved to this day, and temper (see Shepard 1964). Coding systems have been put forward from time to time (e.g. Gillin 1938; Gardin 1958; Ericson and Stickel 1973), including ways of coding the drawings of pots (Smith 1970); perhaps not surprisingly none has gained widespread acceptance. The problems of comparability between different workers, even when using a standardised system, were highlighted by Robinson (1979).

The contextual phase

The work of Shepard (1956) can be seen as a nodal point in ceramic studies. She drew together strands then current – chronology, trade/distribution and technological development – and identified the aspects of excavated ceramics which should be studied to shed light on each of these areas (pp. 102): identification of types for chronology, identification of materials and their sources for trade, and the physical characteristics of vessels to show their place in technological development. In doing so she laid the foundation for many future studies. Much subsequent general work relies heavily on her synthesis of approaches; indeed, one of the challenges of writing this book is to avoid producing a rehash of her work.

Her book also made considerable contributions to ceramic studies in its own right, both practical and theoretical. At a practical level, there were comprehensive attempts at shape classification, based on 'characteristic point' (Shepard 1956, 227-45), drawing on the work of Birkhoff (1933) and Meyer (1888, but see Meyer 1957), and of descriptive systems for 'design' (decoration) (Shepard 1956, 255-305). The latter, drawing on work by Douglas and Reynolds (1941) and Beals et al. (1945), analysed design in terms of elements and motifs, symmetry, and motion and rhythm. On a theoretical level, she gave a detailed discussion of the uses and limitations of the concept of 'type' (Shepard 1956, 307-18). Reacting against the almost Linnaean view of typology that characterised much work from the 1920s onwards, she proposed a view of typology that is tentative rather than fixed, relies on technological features and accepts the limitations inherent in trying to classify pots on the basis of (mainly) sherds. She also repeated the warning about identifying ceramic traditions with cultural entities.

After Shepard's formative work, ceramic studies 'rode off in all directions', and it becomes increasingly difficult to take an overview of a fast-expanding subject. Attempts to maintain such a view were made by the holding of international conferences at Burg Wartenstein (Austria) in 1961 (Matson 1965) and Lhee (Holland) in 1982 (van der Leeuw and Pritchard 1984). The first was held 'to evaluate the contribution of ceramic studies to archaeological and ethnological research' (Matson 1965, vii), but also partly 'to

convince many anthropologists that ceramic studies extend beyond simple description and classification' (Rouse 1965, 284). The second, intended as a follow-up twenty years after the first, had the more difficult task of holding together a subject that was expanding so fast that it was in danger of flying apart.

What were the directions in which ceramic studies were being pulled in this period? Firstly, there was the task of mopping-up resistance to progress beyond the 'sherds as culture type-fossils' attitude of the Typological Period. Typical of this approach are points made by DeVore (1968) that sherds do not actually breed, evolve, and so on, nor do they invade, and Adams' (1979) demonstration of a failure of ceramic tradition to follow known historical events. Nevertheless, pockets of the old view still persist, particularly amongst field staff in teams whose responsibility is split between fieldwork and finds work.

Secondly, a continuation of the trend towards ever-smaller physical units of study is apparent, opening out into a whole spectrum of scientific techniques. At one end we have relatively simple techniques, relying on nothing more than a low-powered binocular microscope and perhaps an algorithm for identifying inclusions (e.g. Peacock, 1977); at the other end are very intensive techniques requiring scientific and statistical expertise to exploit them fully (see scientific methods theme, p. 18).

Another important development was the realisation that the links between 'life' assemblages (pots in use) and 'death' assemblages (sherds as found or excavated) were far from simple, and could be distorted by processes of discard, site maintenance, and subsequent activity on site. Such concerns were subsumed into a wider concern for 'site formation processes' in general (Schiffer 1987), since many of the problems are common to a wide range of material.

This phase also saw serious attempts to integrate ethnographic studies (p. 15), scientific techniques (p. 18) and aspects of technology (p. 17) into mainstream pottery studies. In fact, the apparent diversity of this phase can mask a growing unity, as the way in which all these themes hang together and can support each other is gradually realised. An excellent example of a way in which these approaches can be brought together is Buko's (1981) study of early medieval pottery from Sandomierz (see fig. 1.3).

Finally, the need for standardisation has come to the fore as the need to compare sites, not just to report on each individually, has been felt more keenly. In Britain, this need has been met by semi-official reports (Young 1980; Blake and Davey 1983); in the United States, by manuals devoted entirely (e.g. Rice 1987) or partly (e.g. Joukowsky 1980, 332-401) to pottery. The French approach has been more formal (Balfet et al. 1989), following the tradition of Brongniart and Franchet.

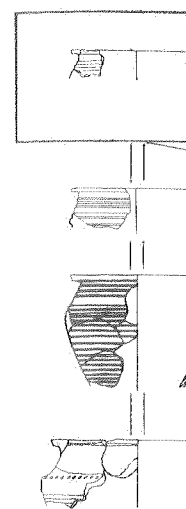


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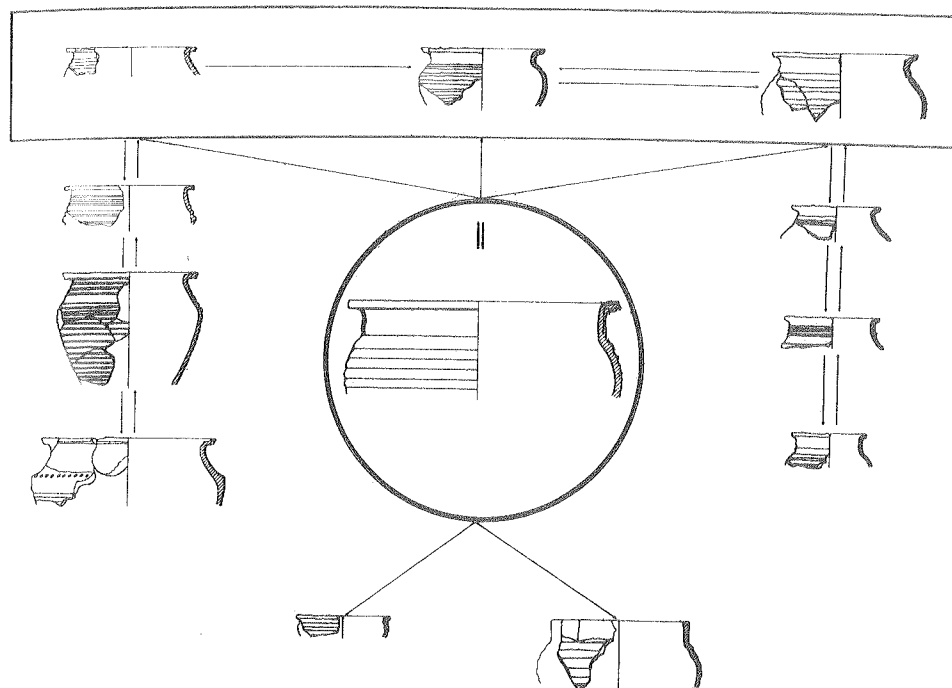


Fig. 1.3. An alternative approach to typology in the contextual phase. The *Vessel Shape Family*, which embraces an assemblage of diverse forms linked by a common set of morphological, technological and ornamental attributes. This association is repeated in the pots, no matter what their function. (Buko 1981, fig. 48 and p. 274)

Parallel themes – ethnography

A major trend is the recognition of the value of ethnographic studies in archaeological interpretation or model-building. A very early interest in the uses of pottery in historic times, chiefly as eating or drinking vessels, was provided by Le Grand d'Aussy (1782). Systematic ethnographic studies of American Indian pottery began in the 1880s (e.g. Cushing 1886); by the 1920s it had developed into a comprehensive study of the pottery production process (Guthe 1925; Linné 1925; Bunzel 1929). An early attempt to link ethnography with archaeology was made by Franchet (1911; see p. 18). Throughout the twentieth century studies were made of potting techniques in many parts of the world; it would be invidious to select from them for this brief survey. The relevance of such work to archaeology was emphasised from the 1950s onwards (Tschopik 1950; Foster 1959; Balfet 1965). In Europe, studies of kilns (as in Hampe and Winter 1962; 1965) seem to have been most taken to heart by archaeologists. Often the function of ethnographic accounts seems to be as a 'cautionary tale', either pointing out situations where pottery does not mirror broader events (Tschopik 1950; Adams 1979) or in describing a specific situation and almost challenging the archaeologist to say whether

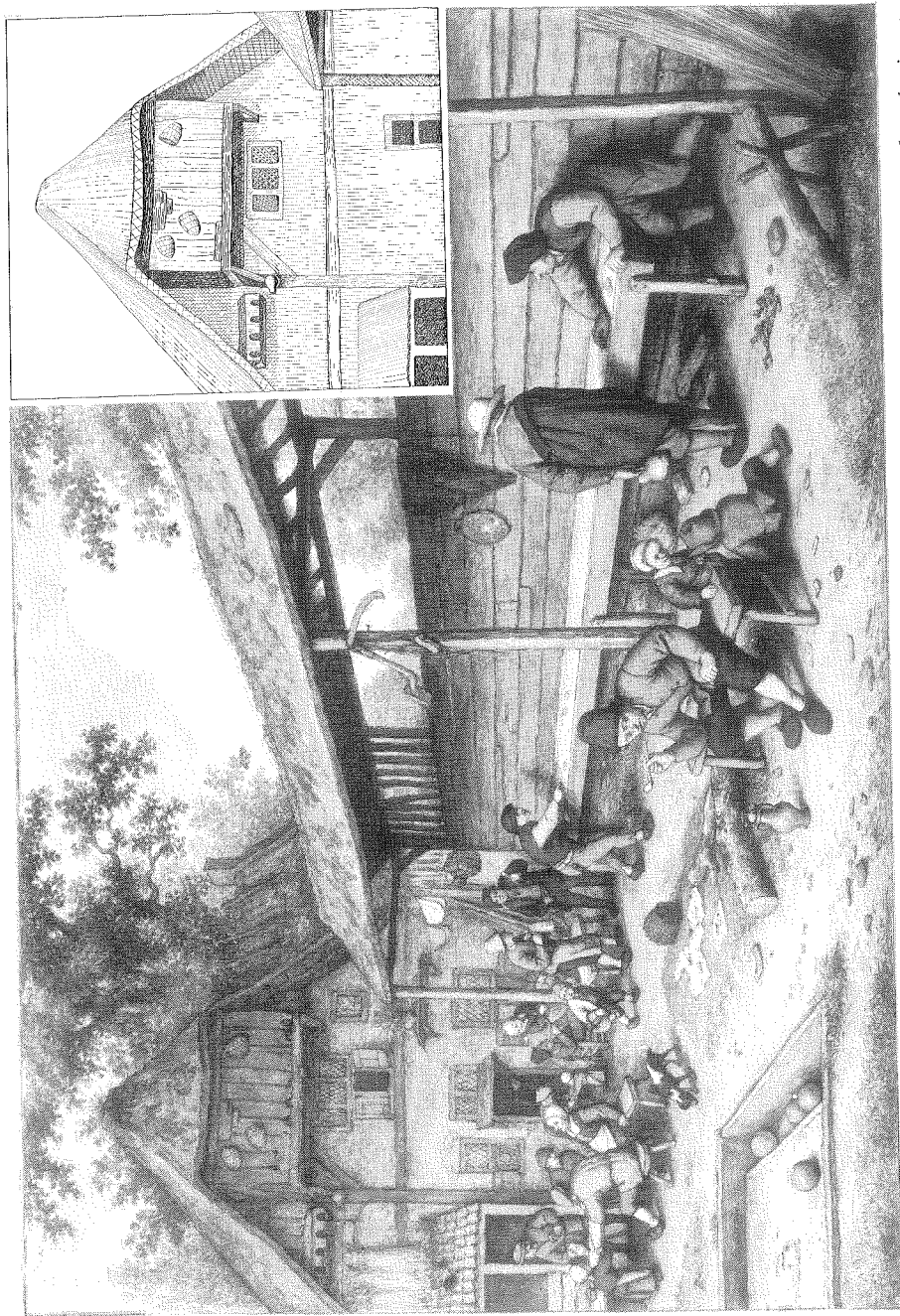


Fig. 1.4. Pottery in art. This painting, *Peasants playing Gallet outside an inn* by Adriaen van Ostade, helped archaeologists to discover the function of some enigmatic pots from London. They were used as bird nesting boxes (inset). (Stevenson 1991). (Photo: British Museum)

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and how he could detect it in the archaeological record. A good example is Papousek's (1984) account of potting strategy in a situation of debt-bondage in Los Pueblos, Mexico.

In the contextual phase, ethnoarchaeology developed as a way of using ethnographic evidence to help archaeologists examine the processes that lay between their excavated finds and the societies that produced and used them. A typical problem is the relationship between 'life' and 'death' assemblages, and how it is affected by differential breakage rates of different types (David 1972; DeBoer and Lathrap 1979). Conventional views on the archaeological study of pottery were challenged, as by David and Hennig (1972) who suggested that archaeological classification might be more detailed than the material warranted. This phase was excellently described by Arnold (1985).

Although not usually regarded as ethnographic evidence, the large amounts of contemporary written evidence for potting in historic periods has contributed to questions ranging from the organisation and methods of pottery production (Le Patourel 1968; Peacock 1982) to the ultimate uses of the pots (Moorhouse 1978). The representation of pottery in art (fig. 1.4) was also seen as giving useful evidence, both of date (one of the earliest studies of British medieval pottery concerned its date as suggested by illustrations in dated manuscripts, see Jewitt 1878) and of function (Jacobs and Peremans 1976).

Parallel themes – technology

As well as the artistic side of ceramics, evidence for its manufacture created interest from the seventeenth century onwards. Conyers observed Roman pottery kilns during the preparatory work for the building of the new St Paul's Cathedral in London (Conyers 1675; 1677) and produced a remarkably accurate account and drawings (Marsh 1978, 195). Pottery kilns in the Nene valley of eastern England were published early in the nineteenth century (Artis 1823), and the vast fineware- (especially samian-) producing sites of France and Germany began to be excavated and published in the nineteenth century – Montans (Rossignol 1862), Westendorf (von Hefner 1862), Lezoux (Plique 1887), La Graufesenque (Hermet 1934) and Rheinzabern (Ludowici 1904). At the end of the century a gazetteer of seventy Roman potters' kilns in France could be produced (Blanchet 1899). The study of kilns continued to be developed and systematised right through to the 1970s (Musty 1974; Swan 1984), although by this date the importance of studying related structures and functions (which had been badly neglected) was being stressed (Musty 1974, 57). Study of kilns as structures led to interest in the firing process (e.g. Colton 1939) and to series of experimental firings of both pottery kilns (Mayes 1961; 1962; Coleman-Smith 1971; Bryant 1977) and tile kilns (Greene and Johnson 1978).

Early interest in the technology of the pots themselves concentrated on the

Fig. 1.4. Pottery in art. This painting, *Peasants playing Gallet outside an inn* by Adriaen van Ostade, helped archaeologists to discover the function of some enigmatic pots from London. They were used as bird nesting boxes (inset). (Stevenson 1991). (Photo: British Museum)



'high-tech' questions of how certain very fine wares were made. Brongniart (1844) analysed the material of Greek black gloss pottery, but unfortunately made an error which was not put right for nearly a century (Binns and Frazer 1929). The study of such approaches has continued with an ever-increasing range of scientific techniques (Bimson 1956; Matson 1981). It developed in two other directions:

- (i) an interest in technology in its own right as an indicator of social progress (in which pottery played a relatively minor part), represented by Scott (1954), Richter (1956) and Jope (1956),
- (ii) after a sporadic early interest (e.g. Greenwell 1877), a broadening-out into the technology of all types of pottery, under the influence of ethnographic work (p. 15), starting perhaps with Franchet (1911). This remarkable set of collected lectures foreshadowed much of what was to be presented by Shepard (1956). He studied the 'primitive' (that is pre-industrial) production processes from the selection of clay to the firing of pots, using both chemical and physical analyses to answer questions that had been a matter of speculation. Although to some extent a product of its time (a strong belief in unilinear evolution and 'progress' shows through in places), this is in many ways a very modern book, and one wonders what its influence would have been if it had been published in English. This approach accelerated from the 1950s (Matson 1951; Weaver 1963; Matson 1966; van der Leeuw 1976; Howard and Morris 1980; Moorhouse 1981), including the work of professional potters (Rye 1981) and the study of ceramic building materials (Drury 1981). As technology was seen more and more in its social setting, the processes which bring about or hinder change came under focus (Nicklin 1971; Blake 1980; Orton 1985b).

Scientific methods have played an increasing role in the study of the manufacture of archaeological pottery. Thin-sectioning was shown to be able to indicate technical differences (for example hand- versus wheel-throwing) (Hodges 1962), and later X-ray methods were used for the same purpose (Rye 1977). Thermal expansion was used to estimate firing temperature (Roberts 1963) and experiments with the scanning electron microscope (SEM) (Tite and Maniatis 1975) have shown that it can help to answer a wide range of technological questions.

Parallel themes – scientific methods

Scientific techniques have been of especial use in three areas of ceramic studies – dating, sourcing (provenance studies) and the study of function. They have also made contributions to the study of site formation processes and in the study of ceramic technology and manufacture (p. 17). The extent

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to which they have permeated at least the thinking, if not always the practice, of mainstream pottery studies, is shown by the extensive list of techniques given by Blake and Davey (1983, 13–22).

Dating

Ceramics were only marginally involved in the 'radiocarbon revolution' of the 1950s and 1960s, rarely having an organic content that could form a basis for ^{14}C dating. However, the potential for extracting remains of organic inclusions (such as crushed charcoal) from low-fired pottery was recognised by Evans and Meggers (1962); this approach has continued to be very useful within its limited circumstances (for example rice husks yielding dates for Thai pottery, Glover 1990, 155).

For a scientific technique suited for dating a wide range of ceramic material we have to wait until the arrival of thermoluminescence (TL) in the late 1950s (Kennedy and Knopff 1960; Tite and Waine 1961). The development of the application of the TL method to ceramics at Oxford was a story of attempts to overcome a series of problems (Fleming 1966; 1970; 1979). Further problems arose from the demands it made on excavation techniques. A more recent technique, optically-stimulated luminescence (OSL) (Huntley et al. 1985) may well replace it in time. An excellent description of both techniques is given by Aitken (1990). The use of remanent magnetism for dating was suggested by Folgheraiter in 1899 but its application requires too many assumptions to be generally useful (Aitken 1958).

Provenance studies

The idea that one could obtain information on the source of pottery by studying the physical or chemical properties of the clay or temper goes back at least a century, but underwent a long period of gestation before emerging as a useful group of techniques in the 1960s. This was probably because of the prevailing belief that coarse wares were not traded over any distance, and therefore had to be locally made, while the sources of fine wares were best determined by other methods, such as stylistic analysis.

The first techniques to be used were petrographic ones, looking at the filler rather than the clay – thin-sectioning (Bamps 1883), gravimetric methods (Jenkins 1908) and heavy mineral analysis (Oakley 1933). Although successful in their aims, the last two failed to become popular, because they were very time-consuming. However, Peacock (1967) recommended heavy mineral analysis for answering very specific questions. The breakthrough came in the 1930s with Shepard's large-scale application of thin-sectioning to discover the origins of Rio Grande glaze-paint pottery (Shepard 1942), which showed the long distances across which coarse wares could be traded. Thin-sectioning started to become popular in the 1930s in America (e.g. Gladwin 1937), Britain (e.g. Liddell 1932, 175) and continental Europe (Obenauer 1936).

Compositional techniques were later to arrive, and have proved especially useful for discrimination problems (assigning 'new' ceramics to one of two or more 'known' groups). X-ray diffraction spectroscopy (XRD) was used inconclusively by Drier (1939), and apparently successfully by Young and Whitmore (1957), who also suggested the use of X-ray fluorescence spectroscopy (XRF). With the successful use of XRF on Mycenaean and Minoan pottery (Catling et al. 1961), it gained an ascendancy over XRD, which was however recommended for high-fired pottery such as porcelain and stoneware (Bimson 1969). Neutron activation analysis (NAA) was another product of this fruitful period, and was also first used on Mediterranean pottery (Sayre and Dobson 1957) and later on mesoamerican pottery (Sayre et al. 1958) and samian ware (Emeleus 1960). Other techniques of this group are optical emission spectroscopy (OES), used first on Roman mortaria (Richards 1959) and later on Mycenaean and Minoan pottery (Catling et al. 1963) and atomic absorption spectroscopy (AAS) (Hughes et al. 1976). The latest technique in this family is inductively coupled plasma emission spectroscopy (ICP) (Hart and Adams 1983). The uses of compositional techniques have been regularly reviewed (e.g. Millett and Catling 1967; Peacock 1970; Wilson 1978; Bishop et al. 1982; Bishop et al. 1990). Early reviews concentrated on presenting and explaining the new techniques, while later ones have concentrated on the problems of a maturing discipline, such as comparability between differing sources of data.

Functional studies

The earliest approach to the study of function was the assumption that it was in some way linked to the original name for a form. The first attempt we have traced (Baif 1536) was in error, but a tradition persisted for centuries of using such terms, especially for classical pottery, for example *olla*, *lagena*, but also for post-medieval British pottery (for example *tyg*; see Celoria and Kelly 1973, 15). Ethnographic parallels seemed for a time to be a way out (p. 15), but doubt has been thrown by studies showing how very similar forms can have different functions (e.g. Miller 1985). Four ways to make progress have been suggested:

- (i) to examine the associations of pottery types with the stratigraphic features in which they were found (Millett 1979a); we shall return to this topic in chapter 13.
- (ii) to examine the residues of original contents or surface treatments. An early example is by van Bastelaar (1877), who found sixty quotations from Latin writers about organic coatings – pitch, oil, wax, and so on – on ceramics and attempted to verify them experimentally. A recent review of the study of visible residues is given by Moorhouse (1986, 110–1). A new development is the use

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of gas chromatography to identify residues extracted from the fabric itself (Evans 1983–4).

- (iii) to examine the physical properties of pottery fabrics to assess their suitability for various functions, such as cooking (Steponaitis 1984; Bronitsky and Hamer 1986).
- (iv) to examine wear marks on pots (Griffiths 1978; Hally 1983), and of sooting on both exterior and interior (Moorhouse 1986, 108–10).

Parallel themes – quantification

We here use the term ‘quantification’ in a precise and restricted sense, to mean the measuring of the amount of each type of pottery in an assemblage, with a view to describing the assemblage in terms of the proportions of each type present. As a concept, it belongs firmly to the ‘typological’ phase, being a *sine qua non* of all attempts to seriate pottery assemblages (except those based on the presence or absence of types, but this approach is usually only applied to grave groups). But equally firmly, in this phase it was not an issue, as study in this phase was at the level of the sherd, so one simply counted sherds, and based analyses such as seriation on the percentages of sherds in assemblages.

With the contextual phase comes the idea that other measures of the amount of pottery might be more appropriate. The first alternative was weight (Gifford 1951), followed by number of vessels represented (Burgh 1959), vessel-equivalents (the idea can be found in Bloice 1971 and Egloff 1973, the term was coined in Orton 1975; see below for definition), surface area (Glover 1972, 93–6; Hulthén 1974) and displacement volume (Hinton 1977). The last two are very similar to weight, and need no explanation; the term ‘vessel-equivalent’ may be less familiar. Starting from the idea that every sherd is a certain proportion of the whole pot of which it once formed part, we can (in theory) assign these proportions to sherds as ‘scores’ and add them up to find the total amount of a type. Since a whole pot has a score of 1, we can say that a group of sherds with a total score of x is equivalent to x pots (x is usually not a whole number). In practice it is not usually possible to assign a score to every sherd, and one is restricted to sherds such as rim sherds whose size in terms of the proportion of some whole (in this instance a complete rim) can be measured. Since we are sampling the measurable sherds from an assemblage, we refer to the *estimated* vessel-equivalent (abbreviated to *eve*). This concept has been misunderstood at times and will be explained in more detail in chapter 13.

Once there was more than one measure, attempts were made to compare them (Baumhoff and Heizer 1959; Solheim 1960). Glover (1972, 96), comparing sherd count, weight and surface area, concluded that ‘any one would be quite accurate as a measure of frequency’. Hinton (1977) compared sherd count, rim sherd count, weight and displacement volume, concluding that weight was the fastest but sherd count probably the most accurate measure,

but of what it is not clear. Millett (1979b) compared sherd count, weight, adjusted weight (an estimate of surface area) and minimum number of vessels; he concluded that they were all highly correlated but, for practical reasons, weight was probably the best. Chase (1985) examined the relationships between sherd count and vessels experimentally, but did not take into account the incompleteness of excavated assemblages. The development of our view can be traced in a series of papers (Orton 1975; Orton 1982; Orton and Tyers 1990). These studies have ruled out sherd count and number of pots as biased, and favour even (where practicable) with weight as a respectable but less useful measure. The arguments will be presented in chapter 13.

Another point that emerged is that two measures together give more information than the two separately. It was first made, in the context of count and weight, by Solheim (1960), and developed by Bradley and Fulford (1980), Orton (1985a) and Schiffer (1987, 282). Such approaches are especially useful in the study of site formation processes (p. 14).

Finally, we can see developing interest in integrating ceramics into a wide analysis of finds assemblages. The approach depends on the nature of the other finds and the way they are recorded, whether in bulk (for example bones) or individually (such as 'small finds'). The former was tackled by Vince (1977), but the latter had to wait until the 'pie-slice' approach (Tyers and Orton 1991; see chapter 13). This must be the next step in ceramic studies: having integrated the various aspects of ceramic studies in the 'contextual' phase (1960-90 and after), we must now begin to integrate ceramic studies into the wider field of general finds assemblages.

Aims

The aims of this study are to provide a comprehensive overview of the history of pottery studies in the variety of archaeological contexts. The test of a good study is that it addresses the themes in a way that is both practical and accessible to all sites, with a view to providing a clear and concise summary of the current state of knowledge.

Discerning the aims of a study is often asked of a reader who has not the experience to do so. It is nevertheless a task that all the queue of 'good' studies should address. Assemblages are not just a collection of information to be recorded without giving any thought to all times and places because at the end of the day they do not mean anything.

The 'big theme'

If you ask someone why they are probably interested in someone's work, they will probably expect to be asked to explain the reasons for their interest.

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- (ii) ...
- (iii) ...

These are the reasons for certain times and places for certain purposes.