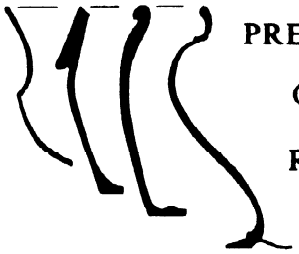

PREHISTORIC
CERAMICS
RESEARCH
GROUP

THE STUDY OF PREHISTORIC POTTERY:

GENERAL POLICIES AND GUIDELINES FOR ANALYSIS AND PUBLICATION

OCCASIONAL PAPERS NOS 1 AND 2

3rd Edition Revised 2010

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The Prehistoric Ceramics Research Group would like to thank Wessex Archaeology for permission to use their visual aids produced by Liz James and Karen Nichols as Appendices 3-6 and 8, and the fabric recording form (Figure 1). Copyright for these belongs to Wessex Archaeology Ltd. The Group would also like to thank Carol Allen and David Knight for permission to use their fabric recording form (Figure 2), for which they hold the copyright. Analysts are free to use the various recording forms in these guidelines, with appropriate acknowledgement of source.

Occasional Paper 1 was originally produced in 1991 and Occasional Paper 2 in 1992. These were reissued in 1995 in a joint edition with slight revisions to OP2. The joint edition was reissued in 1997 in a new revised edition. As is the tradition within the PCRG, no one person has been responsible for any of the editions or versions of Occasional Papers 1 and 2 past or present - all members of PCRG having responsibility for these various outputs.

Further information concerning Group activities may be obtained from the website (http://pcrg.org.uk) or the Secretary: Sarah Percival, c/o NPS Archaeology, Scandic House, 85 Mountergate, Norwich, Norfolk, NR1 1PY

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INTRODUCTION

The *Prehistoric Ceramics Research Group* (*PCRG*) was formed in November 1988, combining the membership of the *Iron Age Pottery Research Group*, which had been operating in eastern England since 1976, and the *First Millennium BC Ceramic Research Group* which covered central southern England and had been formed in 1985. In 1994, the scope of the Group was widened to include specialists studying the ceramics of the Neolithic and earlier Bronze Age periods, thus extending its interests to the whole of prehistoric ceramics in the UK. Indeed, the membership now extends outside of Britain: international conferences have been organized, the Group has published monographs of international scope and members have undertaken research not just in this country but also overseas. Nevertheless, the main focus of the group remains domestic.

In 1991 and 1992 the *PCRG*, through a consultation exercise among its membership, published a handbook and set of guidelines for the study of later prehistoric pottery. A joint reprint of the two papers, published in 1995, sold out within eighteen months. A new joint edition in 1997 provided an expanded section on fabric description, including specimen 'filled-out' samples of fabric record sheets, and an up-dated bibliography. These documents have been extremely successful over the last 10 years and have been reprinted several times. Requests for these now out-of-print booklets are still being received, demonstrating that a clear need for them remains.

The previous *Guidelines* dealt specifically with later prehistoric pottery and reflected the early interests of the *PCRG*. Since the *Group* has expanded its interests to cover all prehistoric ceramics the Committee and Membership of the *PCRG* agreed that, some 11 years on, the *Guidelines* were in need of similar expansion, and up-dating to reflect the large amount of research that has taken place since the original documents were published.

Scope of the Document

This book is primarily intended for use by those finds specialists involved in the study of prehistoric ceramics although it is hoped that it may ultimately encourage others into the discipline. It is primarily concerned with the analysis of pottery and is intended to be a useful aid for both pottery specialists and for all those other archaeologists (amateur and professional alike) who may be interested in the ceramics of this period. It is also hoped that it will prove of use to those involved with the design and the funding of excavation, post-excavation and research projects. Furthermore, it is intended that this book be used as a general basis for the application of a commonly-applied policy for the study of prehistoric pottery as well as being informative in providing a framework for particular excavations and assemblages.

It is not the intention of this book, however, to dictate precisely how and what research should be conducted on prehistoric ceramics and the *General Policies* (Part 1) and the *Guidelines* (Part 2) have been drawn up after discussions with and drawing on the collective experience of members of the *PCRG*. This group of specialist researchers comprises both practitioners and consumers of research into prehistoric ceramics and has, as one of its aims, the promotion of the study of prehistoric ceramics and the promotion of best practice in the study of prehistoric ceramic assemblages. It is hoped that the information contained in these sections, and drawn from this experience, will help to establish standards for use by those researchers involved in the reporting and analysis of prehistoric pottery. The information given reflects the objectives of the *PCRG* by:

- Presenting general principles and promoting policies to improve the effectiveness of ceramic reporting and research.

- Providing a handbook to assist with guidelines on methodological approaches to the reporting of prehistoric pottery.

- Establishing standards in the reporting of prehistoric pottery.

- Presenting the policies and results of prehistoric ceramic reporting and research to a wider archaeological and general audience.

Neither is it the intention of this book to provide a reference manual for the identification of all classes, styles, wares or traditions of prehistoric pottery. Such a book would be so large as to be unwieldy, not to mention prohibitively expensive. Furthermore the majority of prehistoric pottery is locally made exploiting local clay and temper sources, with the result that fabrics can show a great deal of variation within a single tradition. Thus, and by way of example, the Grooved Ware fabrics discussed by some writers working in the south of England are completely irrelevant to Scottish researchers where there is more regional variation and far less fabric homogeneity.

Background to the Study of Prehistoric Pottery

The recognition and early classification of prehistoric pottery (normally claimed as 'Ancient British') was pioneered in the late 19th and early 20th centuries when the depth of prehistory had hardly been realized and when relative chronologies were still formative. By the early 1900s, pottery had been identified as Neolithic (Smith 1910) and Bronze Age (Abercromby 1912). In the 1930s a scheme for British Neolithic pottery and its continental affinities was published (Piggott 1932; Childe 1932) and a national scheme for the classification of Iron Age pottery was proposed (Hawkes 1931). The syntheses of the earlier material necessarily drew on a small corpus while the studies of later material became highly elaborate as it was realized that there was much regional variation as well as chronological development (Cunliffe 1991, 9-13). This realization, coupled with challenges to the accepted invasion hypotheses as an explanation of culture change, eventually led to the abandonment of the ABC system for the Iron Age by the late 1960s, and for similar reasons various attempts to tie British Iron Age chronology to the continental sequence or to adopt continental style type-site definitions of material culture failed to achieve wide acceptance. Continental affinities have also decreased in importance with regard to the earlier material, due partly to a move away from invasion hypotheses but also as the indigenous nature of ceramic development in the Neolithic and earlier Bronze Age has become increasingly obvious.

Current Research Priorities

The past two decades have been marked by a reluctance to accept any nationally imposed framework for prehistoric ceramic studies. Greater emphasis on the indigenous origins, regional development and local manufacture of pottery for the period underlies most modern perspectives on the subject. During the last 20 years, as with pottery studies of other periods, research has expanded beyond the purely chronological and culture-historic concerns of the past. Of particular importance has been the identification of exchange networks, both within Britain and overseas, and the achievement of a better understanding of the social and symbolic aspects of pottery manufacture and use.

Consequently, increasing interest is currently shown in the functional, economic and social aspects of pottery and the closer integration of pottery studies with other aspects of archaeological analysis (Woodward and Hill 2002). The use of pottery as a medium for the study of a wider range of subjects, coupled with a much clearer awareness of cultural formation processes have made the study of prehistoric ceramics increasingly

complex, especially given the increasing number of assemblages from all periods and the recovery of large bodies of later material from open-area excavations. There is also increasing interest in non-pottery ceramics such as briquetage, crucibles, moulds and weights.

Pottery may be recovered in varying quantities from settlement sites, sepulchro-ritual sites and field systems. Settlement sites for the Neolithic and early Bronze Age are comparatively rare though some sites such as the earlier Neolithic settlement at Yarnton (Hey in prep.) or the Beaker settlement at Northton (Simpson *et al*. 2006) have produced substantial assemblages, as have ceremonial sites such as the large henge at Durrington Walls (Wainwright and Longworth 1971). Pottery from sepulchro-ritual sites tends to be more common, particularly in the Beaker and earlier Bronze Age periods but assemblage size can vary considerably. The first millennium BC, by contrast, is the first period in British prehistory for which pottery is regularly recovered in large quantities from settlements. As a result it is the main period in which many academic issues can be considered through the medium of pottery and other ceramic studies (see below). In comparison with historic periods, however, it is important to recognise that there are a number of inherent constraints on how these issues can be addressed.

Throughout prehistory, the detailed location and organisation of ceramic production is generally difficult to identify because of the lack of kilns and other infra-structure. Furthermore, prehistoric vessel forms and fabrics tend to be less standardised than those of the more industrialised modes of production of the Roman and Medieval periods. Low firing temperatures can result in the relatively poor physical survival of pottery, especially for surface collections, and fairly large parts of the country may be virtually aceramic at certain times, or lack sequences of chronologically diagnostic ceramics. There is a general dearth of well-stratified sequences to provide sound chronological frameworks and there may often be relatively few alternative dating methods to provide a detailed framework (coins and associated metalwork being rare).

Alternative dating methods are now becoming more commonly used and more refined, using smaller samples to obtain dates and using statistical packages to refine site sequences. Nevertheless, radiocarbon dating remains problematical for parts of the prehistoric period, particularly in the middle Neolithic where there is a plateau in the calibration curve, and within the Iron Age (but see Haselgrove *et al.* 2001). Furthermore, single radiocarbon dates can provide little more than a broad date range. Nonetheless, the application of radiocarbon dating to burnt residues on the interior surfaces of vessels is now an established direct dating method (Barclay *et al.* 2002; Collard *et al.* 2006).

There is an increasingly large suite of chemical and biomolecular analyses being undertaken on prehistoric pottery. Once the exceptions in ceramic studies, chiefly due to their expense and the few practitioners involved, these analyses are now becoming increasingly common and are undertaken in some post-excavation programs as a matter of course. They take pottery beyond its usual social-chronological parameters and extend its influence on palaeodietary and palaeoeconomic fields. Researchers need to know what analytical techniques are available and, more importantly, what research questions they can address.

These challenges must be taken into account when researchers start considering what the reporting of prehistoric pottery can be expected to achieve. They also by necessity influence the methodology chosen for a pottery report and, in the world of commercial archaeology, this will almost always have a financial implication. The *PCRG Policies* and *Handbook* therefore aim to assist pottery specialists and others with these complexities.

PART 1

PREHISTORIC POTTERY STUDIES – GENERAL POLICIES

Introduction

Ceramic studies can provide evidence on a wide range of issues as described below. This includes the nature of archaeological deposits and finds assemblages, the establishing of chronologies both within and between sites, and the manufacture and technology of pottery. In addition, if the assemblage is sufficiently large, the organisation, distribution and exchange of ceramics and other artefacts can be established together with the functions of vessels, the organisation of settlements, the social and economic status of the people and their expression of cultural and social identity and traditions.

Archaeological deposits and finds assemblages (Pollard 2002; Hill 2002a)

Seven main stages in the formation of pottery assemblages can be identified: manufacture, distribution, use, discard, post-depositional deterioration, redeposition and archaeological recovery. This comprises an holistic consideration that broadly equates to the *Chaîne Opératoire* favoured by continental researchers or the Ceramic Ecology of researchers in the New World. These factors are of interest in themselves but also affect the pottery assemblages available to the specialist. They must be taken into account when judging how assemblages may be studied and what issues may be addressed, as they can have significant methodological implications for analysis.

The elucidation of deposit formation processes can also have considerable implications for specialist studies of other materials and wider issues of archaeological interpretation. Pottery is of particular value in this context because of its physical characteristics and common occurrence.

Chronology between and within sites (Willis 2002; Knight 2002)

The identification, recovery and detailed analysis of diagnostic groups in stratigraphic sequences are of fundamental importance for most regions in all periods of prehistoric pottery studies. The information derived from prehistoric pottery chronologies affects the refinement of all other archaeological studies as great reliance is placed on pottery dating for the primary detailed phasing of most sites.

In the later prehistoric periods substantial assemblages uncontaminated by redeposited material (including those from single-phase, short-lived settlements) have a complementary importance. In view of the problems with radiocarbon dating, the use of AMS dates based on organic residues resulting from the use of vessels can be a particularly useful method. Similarly, the recently discovered method of dating cremated bone (Lanting *et al*. 2001) has opened up a considerable datable resource, particularly for the Bronze Age (Sheridan 2001). These dates may provide an absolute timescale, especially for key ceramic sequences. Secure associations, particularly with datable imports and metalwork, remain important.

Manufacture and ceramic technology (Gibson 2002b)

The clarification of ceramic manufacturing methods for a range of wares of different qualities is an important requirement. The identification of raw material sources, wasters and contexts potentially associated with firing pottery would be of value. Experimental studies have been carried out into many aspects of prehistoric pottery manufacture and deserve greater attention in the reporting of ceramic assemblages. Nevertheless, there is much that can be learned about contemporary ceramic technology from the pots themselves and researchers need to be aware of these important tell-tale traces (Gibson & Woods 1997; Gibson 2002a, 2002b).

The decoration of ceramics may on occasion shed considerable light on other technologies. The use of whipped and twisted cord on Neolithic and early Bronze Age ceramics, for example may shed light on contemporary fibre technologies.

Inclusions of grains within fabrics may have important palaeobotanical implications, particularly in the early period.

Organisation of production, distribution and exchange (Hamilton 2002)
Further work is needed to clarify the social and economic context of production, distribution and exchange mechanisms. This should include comparisons of patterns for wares of different quality, based on regional studies. Distribution and exchange of pottery and its contents should be studied within the context of wider economic considerations. In earlier prehistoric pottery, works of individual potters have been identified (Gibson 2002a, Tomalin 1995) and this aspect of past production, particularly (but not exclusively) for earlier prehistoric pottery, deserves greater research particularly when set against vessel distribution.

Functions of pottery (Morris 2002)
Greater research is needed to determine the function of pottery as revealed by studies of technology, analysis of residues, the study of physical and mechanical properties and identification of use wear patterns. Such analysis should be integrated into wider considerations of food storage, processing and consumption.

Settlement organisation (Woodward 2002)
Where relatively complete or reliably representative settlement assemblages are available, consideration should be given to how far ceramic and other artefacts reflect internal settlement organisation or differing roles between related settlements.

Social and economic status and the expression of cultural and social traditions (Hill 2002b)
The role of pottery in overtly or indirectly reflecting social and economic status, social hierarchies and the expression of cultural and social identities and traditions needs further study at both inter-site, intra-site and regional level.

All of these issues ultimately require a multi-site, regional, or even national approach in order to be adequately addressed. Priorities for regional studies should be assessed on the basis of maximising the investment in relation to these areas of interest, drawing out the full potential of past work. This will provide a strategic framework for future work in areas where sites are likely to be threatened or where major non-rescue research is proposed.

New research is likely to be most useful in:

- Those regions essentially aceramic with a few key sites producing pottery whose publication is a high priority, and where any new assemblages will make a significant contribution.
- Those regions where much work has been done in the past and may well continue, but much remains unpublished and no systematic regional overviews have been attempted.
- Those regions which have been well studied in the past, with publication of site assemblages and some regional studies, where threats are such that major excavations are likely to continue to generate significant bodies of material, and further detailed synthesis is both possible and likely to provide valuable interpretative hypotheses.

Methodological Principles and Issues

Ethics

All ceramic research should be carried out within the broad ethical framework set out in the Institute of Field Archaeologists' Code of Conduct. Standards and Guidelines for Finds Work have also been provided by the IFA (available at http://www.archaeologists.net/modules/icontent/index.php?page=15).

Context

The study of prehistoric ceramics should always be seen as part of the general investigation of archaeology. Methodologically, studies and reports should be designed and should proceed within a clear archaeological perspective, ensuring that appropriate pottery data can be integrated with information from other sources to address questions of archaeological significance to a site or to studies in general.

There is a need for greater integration of pottery analysis with other site data, including information on assemblage formation processes, and spatial patterning in relation to structures.

Excavations

Where possible, pottery specialists should take the opportunity to visit and discuss excavations both at the planning stage and while they are in progress.

Excavators should be asked to bear in mind the need to recover sizeable assemblages particularly where not contaminated by redeposited material. For some periods, especially the Neolithic and Bronze Age, and in some areas such as the north west of England, prehistoric pottery is generally quite scarce. In such cases and areas standardised excavation policies which have been developed for general archaeological use in areas such as southern England are not appropriate and should not be applied. Instead there should be an appropriately framed archaeological brief where for example 100% excavation of features would be necessary in order to recover a sufficiently large assemblage for study.

Standards

In a number of areas, standards in the analysis and reporting of prehistoric pottery have been uneven, resulting in a need to achieve a better basis for inter-site and inter-regional comparisons. Greater attention should be given to the standardisation of recorded information to allow for comparisons within and between regions to be made.

Minimum standards for later ceramics have been published (for instance Slowikowski *et al*. 2001), and the *PCRG* remains committed to the formulation of minimum standards for ceramics of all periods. These *Guidelines* serve as a set of minimum standards for prehistoric ceramics. In summary:

<u>Aims of the Minimum Standards</u>

- To provide a tool for planning and curatorial archaeologists, and others involved in the monitoring process, to assist in the monitoring of archaeological fieldwork, analysis and publication.
- To act as a guide for the profession, and, by the application of agreed minimum procedural standards, to encourage good practice in ceramic research.
- To help museum curators in the management of ceramic archives.
- To establish minimum standards as a guide to students and new entrants into the profession.

<u>Project Design</u>

Consistent standards of recording of fabric and form (such as those laid out in these *Guidelines*) should be specified in the PPG 16 project brief and specifications.

Fieldwork

On-site retrieval and sampling: all ceramics from excavated contexts must be collected.

Processing: all ceramics must be carefully cleaned (when very fragile, conservation advice should be sought first). Where appropriate, ceramics should be washed, but burnt residues and soot must be avoided. All prehistoric pottery should be marked, and Marking, bagging and boxing must utilise archivally stable materials.

Spot-dating and scanning: on-site spot dating or scanning may be carried out if it is decided at the outset that it is advantageous to the aims and objectives of the project.

Assessment

The assemblage must be assessed to determine its potential in achieving the project aims and objectives. Assessment should meet the standards outlined in English Heritage's *Management of Research Projects in the Historic Environment* (2006) (hereafter *MoRPHE*). Since the analysis of many evaluation, fieldwalking or watching brief assemblages will not proceed beyond this point, *PCRG* would propose the recording of:

- broad ware group, e.g. 'LBA flint-tempered wares', or ceramic tradition, e.g. 'Grooved ware'
- quantity (number and weight of sherds).
- presence of vessel forms and other diagnostic pieces (preferably quantified)
- spot dating on a context by context basis

Together with statements on:

- condition of assemblage (or parts of assemblage);
- integrity of assemblage (or parts of assemblage), i.e. comment on possible intrusion and redeposition;
- potential contribution to (a) project aims and objectives, and (b) local/regional/national pottery studies.

Analysis

Fabric, form, number, weight and attributes must be recorded prior to any further analysis and/or archiving. Unstratified material must be scanned, and the ceramic record should be computerised. Computerised data ought to be accessible, and steps should be taken to ensure that it remains accessible for as long as possible, through mechanisms such as the Archaeology Data Service.

Dissemination

The results of any research and analysis must be disseminated in such a way that the conclusions reached are capable of being challenged.

Project Archive

On completion of the project, both the site archive and the research archive must be made available for study through accession to an appropriate museum. *PCRG* recommends the total retention of ceramics.

These points are expanded on and illustrated throughout this document.

Assessment of Assemblages

In accordance with the procedures outlined in *MoRPHE*, realistic assessment should be made of the potential information to be gained from any body of ceramics to be studied. Appropriate levels of recording and analysis should be adopted so as to allow comparison with other assemblages at a level of detail appropriate to the material under examination.

In the case of site assemblages it should *not* be assumed that ceramic analysis for every site deserves the same level of detail. Assessments should be carried out along the lines recommended in *MoRPHE*, and should result in an explicit statement of importance, objectives and methods as part of an integrated Research Design.

To assess a site assemblage the following should be determined:

- periods represented
- whether the assemblage is representative of the excavated area
- quality of the stratigraphy and if there is any spatial patterning
- size of the assemblage
- possible recovery biases
- quality of preservation
- probability of occurrence of redeposition
- range of fabrics and forms
- range of forms and decoration.

Experimental Studies
There is considerable scope for the greater use of experimental studies to explore various aspects of ceramic production and usage, including:

- sources of raw materials and their preparation
- details of techniques for making particular forms and their variability
- techniques of decoration and surface finish
- replication of residues and wear though usage

Publication, archives and storage
Published reports, archive material and storage should be integrated to ensure efficient access to primary material by future researchers.

Ceramic specialists, like any archaeologists, have an ethical obligation to publish results of significant research. Excavators, specialists and museum curators share an important role in ensuring accessibility to primary material. The *PCRG* remains opposed to any discard of prehistoric pottery without very good reason.

All reports of primary research should provide clear guidance to the location and, if appropriate, format of detailed archives and ceramic collections, type series, and so on. Excavated pottery, and other ceramics, should be stored so that the assemblage is referenced and retrievable by context. This should include key items such as sherds drawn for publication, type series, sherds used for scientific analyses and pieces used in museum displays, which may be stored separately.

Reference collections
There remains a need to improve the number, availability and awareness of location of existing regional reference collections of forms and fabrics, and of any other reference material such as regional card indexes of published pottery, and of primary archives.

Education

Educational value of ceramic studies
Educational benefits may be gained from ceramic studies at various levels. These include the development of skills of observation and visual discrimination covering several fields of information, coupled with systematic recording and analysis. There is also a considerable stimulus provided by practical handling and display of ceramics and the interest of non-specialists in aspects of everyday life are revealed by familiar objects such as pottery.

Particular attention is drawn to the following educational benefits that may be specifically gained from ceramic studies at a variety of levels.

- The development of skills of observation and visual discrimination covering several fields of information, coupled with systematic recording and analysis.
- The stimulus provided by practical handling and display of ceramics and the interest of non-specialists in aspects of day-to-day life as revealed by familiar objects such as pottery vessels.
- Learning about one of the fundamental building blocks for understanding the past, and how it contributes to the overall view of human later prehistory.
- The potential for interactive studies through experimental production of pottery, especially when there is no need for special equipment such as kilns or special materials.
- The wide variety of topics covered by the study of one artefact type.
- Understanding the complexity of cultural formation processes.

Appropriate levels of education
The educational potential of later prehistoric pottery studies should be developed at an appropriate level through university and further education courses, museum displays, school projects and more informal opportunities.

Opportunities for research
The educational value of research projects which involve a significant element of ceramic analysis should be promoted more strongly both with respect to scientific techniques and in the wider archaeological context outlined above.

Organisation and Funding of Prehistoric Ceramic Research

The organisation and funding of ceramic research will only be cost-effective if it is geared to attaining the academic and methodological objectives of the discipline.

Regional perspectives
Almost all of the basic academic issues outlined above ultimately require a regional perspective if they are to be pursued effectively. To achieve a regional perspective requires a foundation of site assemblages recorded to a standard which allows reliable inter-site comparisons to be made or reliable samples of material to be chosen for additional specialist analysis. An essential objective of regional ceramic studies must be to stimulate improvements in the analysis and recording of site assemblages through a greater awareness of key regional issues.

Effectiveness of organisation and funding
In assessing the effectiveness of the organisation and funding of prehistoric ceramic studies and the need for any improvements three tests are thus appropriate:

- Do the organisation and funding arrangements facilitate and encourage regional studies of an appropriate kind?
- Do they promote primary recording and analysis to an adequate standard?
- Is there effective feedback from regional studies to improve site-specific analysis?

Research projects
General research projects have often proved valuable in dealing effectively with regional, functional, technological or other academic questions, whether undertaken in university or museum contexts. However, most projects are single site studies in the context of rescue excavations. This is attributable to several factors relating to the promotion of university and museum research, and the number of students available compared with the large number of potential projects, of which prehistoric ceramics form

only a part. There may have been some underestimation of the educational value of research in this field in the past.

Excavations with objectives for ceramic research
Well targeted individual rescue and research excavations with important objectives for ceramic studies have also proved effective in several cases (though inevitably there can be some delays to the publication of some key sites). Nevertheless, too few opportunities for such work have occurred in the past, particularly in areas where there has been much rescue excavation but few sites providing high quality ceramic information. In these areas there is increasingly a case for undertaking selective research excavation with a primary aim of recovering key ceramic sequences.

Project-funded rescue excavations
Project-funded rescue excavations have collectively (and sometimes individually) generated considerable bodies of data, and some individual projects or groups of projects have achieved important results for the study of prehistoric pottery. In most areas however, site-specific project funding has repeatedly resulted in a lack of continuity or failure to develop a coherent framework or adequate resources for multi-site or regional studies. The result has been a failure to make the best of material generated by rescue-driven research.

Developer funding
The increasing plurality of funding, and more particularly the growth of developer funding, has had a significant effect on the opportunities for ceramic research. It is sometimes possible to obtain developer funding for programmes of scientific analysis beyond the minimum requirements for each site but this is by no means always the case. Specialists should attempt to ensure dissemination of material recovered during archaeological assessments which are not likely to be followed by full scale excavation.

With the gradual trend to more developer funding for specific rescue projects, greater consideration should thus be given by other funding agencies to supporting studies of strategic value in building up coherent regional frameworks for ceramic studies, particularly in areas where rescue excavations are likely to continue or increase. Such studies would maximise the results of earlier excavations howsoever funded.

The tendency for archaeological contractors working in a developer-led environment to work outside of regional parameters may occasionally lead to a lack of communication between regional curators and/or ceramic specialists. This may also hamper the formulation of regional syntheses.

Scientific analyses
Although a specialist petrological service for the analysis of pottery from government-funded rescue excavations once existed, the programme of analysis was generated by the isolated, project-by-project requirements of individual excavators rather than through coherent research projects. Even where a relatively co-ordinated series of analyses had been organised, there has been, with some notable exceptions, little provision for synthetic publication of these results drawing together the ceramic and petrological evidence. Most university and museum based programmes of scientific analyses have more clear-cut research objectives.

Similarly, chemical and biomolecular analyses have generally been carried out on an *ad hoc* basis outside of the university environment. Much of the non-university-based work has been undertaken without clear research objectives or indeed a well-formulated and controlled sampling strategy.

Specialist petrological and other analyses related to the manufacture and use of pottery undertaken in the context of rescue excavations should be geared to coherent national

or regional projects of recognised value. Increased regional facilities for such analyses and the publication of periodic syntheses are needed (Morris 1994; Morris and Woodward 2003).

A useful summary of the types of ceramic analysis that may be applied to prehistoric ceramics can be found in Barclay (2000).

Summary
In summary, it can be seen that there is at present a mis-match between the primary academic issues which ultimately need to be addressed on a *regional* basis and the organisation and funding of ceramic research which is predominantly (though not exclusively) *site-specific*. This mis-match should be redressed by increased support for regional studies in consultation with specialists in prehistoric ceramics and regional curators.

Personnel

Career development and the promotion of coherent research
Where ceramic research has been organised on a site-by-site basis, in effect simply providing a service to (or indeed carried out by) individual excavators, there has tended to be insufficient long-term commitment, too rapid a turnover of specialists or simply too little opportunity for coherent research aims and methodologies to be developed on a regional basis. This is particularly true where rescue projects have not generated a sufficient supply of material to justify the long-term employment of a full-time specialist.

It is hoped that the development of better career opportunities for prehistoric pottery specialists, together with this coherent set of guidelines will help to alleviate the repetition in establishing recording systems and familiarisation with local ceramic traditions. Problems of comparability between published site assemblages need to be seriously considered when reporting on prehistoric pottery; the *PCRG* guidelines should help to provide more coherent and similar results.

Maximising use of existing expertise
Lack of support for regional research projects has contributed to this problem: freelance or unit-based specialists with considerable experience represent an under-used resource for research of this type, where experience should be a key qualification. As a result valuable expertise is often wasted, opportunities to establish more coherent overviews at regional level are not taken and there remains little sense of wider achievement.

Training
There are a few university departments offering courses which specifically include training on pottery studies and these are listed on the *PCRG* website (http://www.pcrg.org.uk). In addition, some archaeological organisations are now more likely to offer training within their working environment as part of professional development programmes.

There has however been little provision for expertise to be passed on to relatively inexperienced practitioners to ensure they reach an acceptable level of competence through proper training. This could be achieved in a variety of ways, and would be a sound investment for the future. For example, IFA bursaries and other similar apprenticeships should be encouraged.

Promotion of standards
In trying to improve or maintain standards of identification, analysis and comparability between sites, greater care should be taken to ensure EITHER that experienced

specialists familiar with the region undertake the work OR that explicit provision is made in post-excavation assessments for adequate liaison or consultancy with a recognised specialist.

Summary of Policies for the Study of Prehistoric Pottery

Academic Issues
The principal academic issues that should be addressed are:

- The nature of archaeological deposits and finds assemblages
- Chronology
- Aspects of manufacture and ceramic technology
- The organisation of production, distribution and exchange
- Functional uses of pottery
- Settlement organisation
- Social and economic status and cultural expression

It is recommended that ultimately these should be considered within an inter-site, regional or wider perspective.

Methodological Issues
Prehistoric ceramic studies must be conceived as part of a wider whole, fully integrated with other lines of archaeological evidence through a clear methodological framework.

Realistic assessments should be made, using specific criteria, of the potential of any body of material to be studied in order that appropriate levels of recording and analysis may be adopted, justified and funded.

Clearer standards of ceramic analysis are needed to ensure inter-site comparability, particularly with regard to the range of attributes routinely recorded and to more explicit statements of objectives and methods in order to improve the quantification of the data.

Greater use should be made of experimental studies and scientific analyses within coherent research frameworks with clear archaeological objectives.

Education
The wide educational value of ceramic studies should be promoted at various levels, particularly with reference to the development of observation and analytical skills, and to understanding the wide variety of topics that can be addressed and the light that can be shed on the nature of archaeological deposits themselves.

Organisation and Funding
There should be greater investment in regional studies, with particular emphasis on maximising the potential of material already recovered, and laying a sound strategic foundation for future studies of site assemblages.

Personnel
Under-used expertise amongst unit and freelance researchers in prehistoric ceramics should be utilised more effectively for both regional research and for training, both of which require experience to be effective and which represent sound investments for the future.

The use of inexperienced practitioners for the recording and analysis of major assemblages of prehistoric ceramics should be avoided if possible and, where unavoidable, the potential problems that may arise should be reduced by providing more training opportunities, including specific guidance by recognised specialists.

PART 2

GUIDELINES FOR ANALYSIS AND PUBLICATION

1 INTRODUCTION

1.1 The Guidelines

The Study of Later Prehistoric Pottery: General Policies, as originally conceived (PCRG Occ. Pap. 1, 1991), outlined the reasons why later prehistoric pottery should be recovered and studied. It presented the major academic objectives that should be pursued. This has been revised (Part 1 above) to refer to all prehistoric pottery. This revised paper now suggests standards of data recording and analysis for achieving those objectives in practice. It presents a recommended list of variables which, when selected for investigation, will assist the archaeologist studying prehistoric material with these objectives in mind. The variables demonstrate a range of factors commonly found amongst prehistoric pottery in Britain. Each variable, or field of record, is discussed below depending upon the necessity for standardisation or flexibility within that variable (Section 2).

Not all variables can be recorded for all pottery, nor will it be necessary to record all such variables for every assemblage. The work undertaken will largely be dependent upon the post-excavation research design (Section 1.2) and this, in turn, will usually be dependent upon the nature of the assemblage. The contributions which may be obtained by recording selected variables (Section 1.3) and the minimum range of variables required to be recorded for all prehistoric pottery (Section 1.4) are presented.

1.2 Post-Excavation Research Design

The analysis of prehistoric pottery should have clearly stated aims followed by objectives linked to a carefully planned methodology. These objectives need to be established before analysis begins and in consultation with the project director or the excavator, if possible. The objectives will be based on the type and nature of the site or project within its regional context, the nature of the assemblage including its size and quality and the contribution that this assemblage could make to the local, regional and national requirements outlined in the general policies document above. The research design should clearly indicate how these objectives will be achieved and include the methods that will be employed to attempt to solve the questions being asked.

The specialist must discuss with the project director the problems and possibilities that will or may be encountered with the assemblage. They must find out what likely contribution this assemblage might be able to make both to the project report itself and to pottery studies of the period(s) and the region generally.

The relevant criteria for assessing site assemblages were defined in the general policy document as: period(s) represented; completeness or representativeness of areas excavated; quality of stratigraphy and spatial patterning; size of assemblages; possible recovery biases; quality of preservation; probable occurrence of redeposition; range of fabrics, forms and decoration; quality and range of wares represented; and rate of occurrence of diagnostic forms and decoration.

MoRPHE sets out the staged procedures required for projects supported by English Heritage, but English Heritage also recommend this document for more general use. The post-excavation assessment stage is vital to the satisfactory definition of the

potential of the material recovered and the adoption of a suitable level and method of analysis and reporting. The complexity of this process as defined by *MoRPHE* and the *PCRG*'s own criteria given above should not be underestimated, especially for large sites.

1.3 The Range of Variables to be Recorded

The range of variables that it is possible to record is presented here. The kinds of information which can be acquired from each variable are also discussed (Section 2). Not all variables can be recorded for each sherd. The order of variables presented here is not necessarily the order in which recording needs to take place and analysts should determine what best suits their own recording style or which order may be most appropriate for the material under examination.

Fabric Type
Form Type
Vessel Type
Extent of Rim
Number of Sherds
Weight of Sherds
Diameter of Rim (min; max)
% Rim (min; max)
Diameter of Base (min; max)
Wall Thickness
Surface Area/Sherd Size
Girth/Shoulder Diameter (min; max)
Colour
Surface Treatment (type; position)
Decoration (type; specifier; position)
Manufacturing Technique
Residues (type; position, visible/absorbed)
Perforation (type; pre- or post-fired; position)
Firing Conditions
Condition of Sherds
Re-use
Cross-Context Joins
Illustration No.
Height (minimum if part of vessel)
Comments

1.4 Objectives, Methods and Minimum Standards

The general policies section above presents seven major research topics or objectives that the *PCRG* have determined as being the primary goals to be achieved. Each of these is discussed here, and the variables that would be useful in attaining these goals are indicated (Table 1). Not all of the objectives can be investigated from every site assemblage of prehistoric pottery; the potential of each assemblage must be individually established before the objectives are selected (Section 1.2).

However, in order to achieve virtually any of the basic objectives set out in the general policy section, it will always be necessary to record the following variables, since each of these is relevant to six out of the seven academic issues (above, p. 12):

Fabric
Form
Number of Sherds
Weight of Sherds
Surface Treatment
Decoration

These variables are thus considered to be the *minimum* required when recording prehistoric pottery recovered from all types of projects.

1.4.1 *The nature of archaeological deposits and finds assemblages*

The history of sherds - how the pottery reached the deposits that have been subsequently excavated - is a complex and infrequently investigated aspect of the study

of prehistoric ceramics. It is essential to determine the nature of the excavated contexts and what the sherds represent in terms of past human behaviour.

The need to recognise redeposited material within an assemblage has long plagued analysts of prehistoric pottery. Single period sites, including sites of different sub-phases within the Iron Age (i.e. early, middle or late Iron Age) should be given high priority for investigation in all regions in order for regional ceramic phases and typologies to be clarified, unhindered by major redeposition interference. The *PCRG* recommends that the terms 'residual' and 'residuality' be phased out of the literature and that instead the mechanisms of redeposition and formation processes be emphasized.

Where assemblage size allows, the seriation of groups of pottery with a minimum quantity of material (1.4.2) can be employed to explore these problems using data from those variables which determine vessel types and wares, the quantity of material present and the mean sherd size, the condition of the sherds and any cross-joining of sherds between features or significantly different layers. Seriation will pinpoint mis-matches of diagnostic forms of two or more different periods, mis-matches of dating suggested by fabric proportions and by diagnostic forms and variations from the mean sherd size (average weight, average surface area or average area to thickness ratio).

1.4.2 *Chronology*

The date range of the pottery is a primary goal for every project whether it is an evaluation, a watching brief, a detailed excavation, fieldwalking survey or research using museum collections. Ceramics are fundamental in formation of the basic relative framework for establishing any understanding about the duration of site occupation, the intensity of occupation, the range of site functions and site status, as well as the development of the economic and political organisation of the prehistoric period. It is important to investigate any changes in activities recognised on a site and on multiple sites within a regional framework, and this can only be done when the ceramic sequence in a region is understood. This is an on-going situation that needs continuous reassessment.

The variables that can be used to assist in the determination of the date range of the pottery are: fabric, form, extent of rim surviving, decoration, surface treatment, manufacturing technique, and the number, weight and condition of sherds. Occasionally number and weight can be used to determine the nature of a particular fabric and form combination, or ware, though this is less relevant to earlier Neolithic and Bronze Age material where fabric in particular can be extremely variable within vessel typologies. In larger later prehistoric assemblages the minimum number of sherds from which the dating of a defined episode of occupation can be determined with any confidence is in the range of 25-30 sherds. This amount has been shown to be useful for the statistical assessment of the dating of features (Shennan 1981) and, on a practical basis, it is usually the number of sherds necessary for at least a small number with diagnostic rim or vessel forms to be present.

Table 1: Variables relevant to different research objectives

Variable	**Nature of deposits**	**Chronology**	**Manufacture technology**	**Production distribution**	**Function & use**	**Settlement organisation**	**Social/cultural expression**
Fabric type	*	*	*	*	*	*	
Form type	*	*	*	*	*	*	*
Vessel Type		*	*	*	*	*	*
Extent of form	*	*			*	*	
No. of sherds	*	*	*	*	*	*	*
Weight of sherds	*	*	*	*	*	*	*
Diameter of rim			*		*	*	
% of Rim	*						
Diameter of base		*	*		*	*	
Wall thickness	*		*		*	*	
Height			*		*	*	
Girth/shoulder			*		*	*	
Surface treatment	*	*	*	*	*	*	*
Decoration	*	*	*	*	*	*	*
Manufacturing technique		*	*	*		*	*
Residues				*	*	*	
Perforation type			*	*	*	*	
Firing conditions			*	*		*	*
Condition	*	*			*	*	
Colour			*		*		
Re-use				*	*	*	
Cross-context joins	*						

The *PCRG* has discussed at length the application of the 'Estimated Vessel Equivalent System' of measurement, or 'EVES' (Orton 1980). Unfortunately, the often irregular shape of prehistoric pottery, due to the level of technology employed and the organisation of production, does not always allow for the implementation of this statistically justified system of comparative quantification. 'EVES' can be determined reasonably accurately in some, but by no means all, cases. The recommended list of variables does include the necessary fields for recording the details to determine the 'EVES' (Diameter of Rim min/max and % of Rim min/max) and the *PCRG* recommends that these variables be recorded wherever possible. The best situations where this might be utilised are with projects which are examining the nature of craft specialisation or where large groups of complete vessels have been recovered.

1.4.3 *Aspects of manufacturing and ceramic technology*

The technological aspects of the manufacture of prehistoric pottery are poorly understood by many archaeologists. This is partly a result of the notable lack of evidence for the locations of production, except in rare cases from the very latest pre-Roman Iron Age period, and also because many ceramics manuals are written by craft potters unaware of the properties of naturally occurring un-prepared clays. Nevertheless, details of manufacturing technology can be reconstructed from the observation of a range of the recorded variables but this requires an understanding of the processes and variables in the firing process itself. For example, the examination of fabric, form, colour, manufacturing techniques such as pinched, hand-built, wheel-thrown, wheel-finished, slab-built, or coil-built vessels, as well as decorative motifs and designs and surface treatments such as wiping, burnishing, application of slips and the coloured infilling of designs are typical selections.

In addition, the range of rim and base diameters, wall thickness, vessel heights and the diameters of shoulders and girths can be used to investigate uniformity or standardised parameters, particularly in later prehistoric ceramics, but less so in Neolithic and Bronze Age material. Evidence for the control of firing conditions is also useful in the latest of prehistoric assemblages to determine whether bonfires or kilns have been employed as part of the manufacturing system. The locations of production can be deduced from the recognition of quantities of wasters (such as spalled, dunted or overfired and half-fired vessels) and objects resembling kiln furniture.

All aspects of manufacturing need to be investigated within a chronological framework since it is the dynamics of manufacturing, the changes within the system of pottery manufacture, which will provide information about the social and economic system within which it occurred. Manufacturing techniques and aspects of craft specialisation are particularly important during transition phases, such as from the earlier to later Bronze Age, the early to middle and the middle to later pre-Roman Iron Age. It is important that the quantities of sherds bearing this information should be represented both by weight and by number of pieces in order to represent the fragmentation of the material for comparison between deposits, phases, and sites where similar material is recovered.

1.4.4 *The organisation of production, distribution and exchange*

The investigation of production, distribution and exchange is dependent upon determining the levels of production as evidenced from the range of pottery found at an occupation site and also how that information compares with intra- and inter-regional information throughout prehistory. It is necessary to find out whether all of the pottery recovered could have been produced locally, whether

some was produced within the region, or whether all of the material could not have been produced from local raw materials (i.e. is non-local in origin). The results need to be compared to other sites in the area to ascertain if this is a common or unusual pattern, and whether this pattern changes through time. This comparative research will establish the nature of the production and distribution systems in an area and also how that system is manifested through time. This particular research objective is closely linked to manufacturing (section 1.4.3) when investigating traces pertinent to the identification of craft specialisation.

The process of production is often based solely on determination of the general sources of the inclusions and clay matrices in fabric types through scientific analysis and the correlation of these to a combination of forms, vessel type, decorations and surface treatments, perforations, manufacturing techniques and firing conditions, which together determine wares. Vessel function, both general uses and subsequent repairs and re-use, can affect production and archaeological distribution of sherds. These wares, when divided into local, regional and extra-regional products, can be quantified (using number and weight of sherds) within a chronological framework (Section 1.4.2) to determine the importance of each level of production and distribution. This information can contribute to a better understanding of economic systems during the prehistoric period.

In the case of earlier prehistoric pottery, there are added complications in the analysis of fabric. It is becoming recognized that some tempers were being deliberately chosen, perhaps for symbolic reasons. For example, quartz is a commonly chosen temper for the Mortlake style of Peterborough Ware, shell is commonly chosen, particularly in southern Britain, for Grooved Ware and grog may be chosen for Beakers and Collared Urns. This deliberate selection may result in the use of non-local tempers in otherwise locally made pottery and may skew any petrological analysis. It is particularly important, therefore, to take care to distinguish between deliberately added and naturally occurring non-plastic inclusions.

Occasionally, and particularly in the Neolithic and earlier Bronze Age, vessels of individual character can sometimes be used to identify the work of a particular potter. The variables used will be form and decoration. Care needs to be taken when attempting to identify the work of an individual as so much of Neolithic and Bronze Age ceramics is produced within distinct typological parameters.

Fabric, form, decoration, surface treatment, manufacturing technique and firing conditions, as well as the selection of sherds for scientific analysis, can thus all be important in the investigation of production and distribution.

1.4.5 *The function and use of prehistoric pottery*

There is a tendency to forget that pottery was produced to be used and that these uses will often have influenced the manufacture of the material. It is important that the function and use of pottery be investigated to help find out why forms and fabrics changed. Such information can assist in understanding the storage, processing and consumption of food, and investigate the differences and similarities between sites.

Intended vessel function and actual vessel use can be examined using a combination of the fabric, form and size of the vessels, the presence of residues, the evidence for wear-and-tear and the context of recovery. The nature of the

fabric (i.e. the type, size and density of inclusions which can be used to investigate topics such as mechanical and thermal shock resistance) coupled with the vessel form, size and wall thickness are pre-requisites for establishing the range of vessels within an assemblage and a framework for vessel functions (Howard 1981; Braun 1983; Hally 1983).

To assist in determining actual function, the analysis of residues (Bethell, *et al*. 1993; Bonfield 1997; Charters *et al*. 1993, 1995, 1997; Copley *et al.* 2003; Craig *et al*. 2000; Dudd & Evershed 1998, 1999; Dudd *et al*., 1998, 1999; Evans & Hill, 1982; Evershed and Tuross 1996; Evershed, *et al*. 1990, 1991, 1992a, 1992b, 1994, 1995a, 1995b, 1997, 1999, 2003; Heron & Evershed, 1993; Heron *et al*. 1991a, 1991 b, 1994; Michel *et al*. 1993; Needham and Evans 1987; Raven *et al*. 1997; Regert *et al*. 1998, 2001; Rottländer & Hartke, 1982; Stern *et al*. 2000, 2003; Urem-Kotsou *et al*. 2002a, 2002b) and the recording of usewear patterns (Hally 1986) are necessary, bearing in mind that not all residues are visible and some may be absorbed into the fabric of the pot. If a large assemblage with measurable forms is available for analysis, then a range of possible uses, for example storage, preparation and cooking, serving and funerary vessels, may be suggested (Henrickson and McDonald 1983). Variation in rim diameter ranges between broad classes of forms or vessel capacity variation can be compared in order to examine inter-site assemblages (Woodward and Blinkhorn 1997).

The presence of attachments such as lugs or handles, perforations, the presence or absence of surface treatment such as burnishing to indicate water containers (Lambrick 1984) and any decoration which can signify display vessels are particularly useful to determine the likely role of a pot. The combination of height and girth diameter will provide a general guideline as to volume, i.e. small, medium or large in capacity. This information should be examined from single phase and multi-period sites within a regional framework, as well as between regions, throughout prehistory.

1.4.6 *Pottery as an indicator of settlement and/or ceremonial organisation*

The variables necessary to investigate site activities are similar to those for the organisation of production and distribution (1.4.4) and vessel function and use (1.4.5). The attributes that are recorded for these variables can be re-examined within a framework designed to analyse spatial distribution at occupation and larger ceremonial sites. This information can in turn be reassessed by comparing the range of attributes between sites within the settlement system. This particular objective has seen very little, if any, emphasis in recent years despite an assumed differentiation in status due to the accepted recognition, at least in the later prehistory of southern Britain, of a changing settlement hierarchy. The range of forms present has not been assessed between sites to determine differences in site activities between sites in similar geographical areas or between different areas.

1.4.7 *Social, economic and cultural indicators*

Pottery, as a reflection of social status, hierarchies and group identity, has rarely been investigated in Britain outside of burial environments, for example the funerary pottery of the early Bronze Age. Intra-site and regional relationships may be equally significant, as are the wider concepts of symbolic behaviour. Therefore, a chronological investigation (1.4.2) of production and exchange systems (1.4.4) manufacturing different fine and coarse wares (1.4.3), and the locations of recovery (1.4.6) and patterns of use of these different wares (1.4.5), with an emphasis on design analysis, could assist in this objective. The alteration

between decorated and undecorated phases during prehistory should be investigated to determine why this may indicate more than simply a chronological development in vessel manufacture. The recognition of the disposal of pottery as not simply meaningless rubbish discard but also as socially meaningful behaviour is an under-explored field, particularly in later prehistoric pottery studies.

Within the sepulchral pottery of the late Neolithic and Early Bronze Age, it may be dangerous to equate a sepulchro-ritual context with a prestigious pot. It has been noted, for example, that some Beakers from graves may be poorly made, poorly decorated or even incomplete (Boast 1995; Gibson 2002a). The completeness of vessels in burial environments of this period is worthy of further study.

2 THE VARIABLES

This section defines those variables which can assist in providing a better understanding of prehistoric pottery and the contribution that this material can make to explaining the archaeology of this period. The length of presentation for each variable is determined by the difficulty members of the *PCRG* have encountered with that aspect.

2.1 Fabric type

A fabric type is a definable collection of information about the range of inclusions, the clay matrix, the colour of the clay and (primarily for some later prehistoric pottery only) the firing of one or more sherds. It is well understood that the macroscopic definition of a fabric type can be a very subjective activity. Nevertheless, the description given must be recognisable by more than one person and therefore it is hoped that the information and guidelines presented here will assist analysts in achieving this aim. An additional problem is that prehistoric pottery is notorious for its tendency to present extreme variability within the fabric of a single vessel.

2.1.1 General information

Find out what the local geological deposits and soils are for an area of at least 10km around the site because the majority of prehistoric pottery is produced within a local or regional production system. Use the Regional Geological Survey books, Geological Survey Memoirs and the 1:50,000 Geological Survey solid and drift maps, if available. Think about the likely types of inclusions to be found in the assemblage, both natural and deliberately added as temper, and how to recognise them before you create any fabric type definitions. Remember, fabric types are generally subjective categories for ordering data. They are not necessarily real phenomena, but are groups of information which can be defined, described and repeatedly recognised by more than one analyst. The creation of a ‘fabric type’ is one of the best examples of the highly subjective methodologies which characterise archaeology. For that reason, it is essential that all analysts recognise that fabric descriptions are only definitions of phenomena, using parameters which they have themselves created.

One common method is to lay out by context a large (or reasonably large) proportion of the pottery. Check that the sherds are marked. Then examine each sherd - both the surface area and the fracture or break. Separate the sherds into groups, each representing a definable fabric type using as many of the fields presented on a Pottery Fabric Record form (Section 2.1.2) as are relevant (if you do not already know how to do this analytical procedure, you must be trained by another pottery analyst).

Then fill out a Pottery Fabric Record sheet for each fabric type as explained below (Section 2.1.2). Select a sherd which is typical of this fabric type, and also other sherds which represent the full range encountered, to create a pottery fabric reference collection. As you continue your analysis and sorting of fabrics, new samples may need to be collected in order to demonstrate the range of variation which you have determined will represent any one ‘fabric type’. You may also find that some previously-defined types are variations of a single fabric and can be amalgamated. This exercise will help greatly with subsequent writing.

2.1.2 Definition of a fabric type

A 'fabric type' should consist of the clay matrix and inclusions found in that matrix which are visible to the eye macroscopically, and also those visible with the aid of a hand lens or binocular microscope. In addition, when possible, the use of petrographic analysis may microscopically increase the information visible macroscopically (Peacock 1970; Williams 1983), and may help revise or consolidate fabric types.

A recommended form to record information about a fabric is the Pottery Fabric Record, a sample of which is included here (Figure 1). Do not try to finalise this form until you have progressed through a large proportion of your material since a fabric type will usually encompass a considerable variation depending upon the nature and date range of your assemblage. Do not be surprised if this needs to be altered as analysis progresses through the collection.

Fabric codes are used to designate different fabrics. This is largely dependent upon the 'inclusions' section of the form, so wait until that section is completed.

The *PCRG* recommends the use of site-specific alpha-numeric systems for fabric codes (Appendix 1). A simple alpha-numeric system combines one or two capital letters indicating the major inclusions present with a unique Arabic number. Appendix 1 presents a set of code letters for the major type of inclusions found in prehistoric pottery in England. Aspects of fabric complexity can be revealed by adding alpha-code letters for less obvious inclusion types. The list is not nationally definitive; additional letters may be appropriate for some areas due to geological differences.

An alternative coding system (Figure 2) enables a database of fabric types to be established, which can be correlated with other sites and other periods, and which will then be available for analysis. The format is to use four alphabetical characters. The first two characters indicate the main inclusion type, again using the codes from Appendix 1 (e.g. SH: shell). The third character designates the quantity of the main inclusion and the fourth character the modal size of the inclusions (e.g. SHMC: moderate coarse shell). Recommended conventions for the description of frequency classes and modal size classes are listed in the following section, and summarised in Figure 2. If the material being categorised seems to lie between two codes, it should revert to the lower designation (e.g. rare to sparse fine quartz = QURF). If a fabric contains several main inclusions (for example shell and quartz) a more complex combination of codes may be employed (e.g. SHMC/QUMC: moderate coarse shell + moderate coarse quartz).

A common name may also be used to define certain fabrics: this is the name by which the fabric type is commonly known or will be known in the future. It is the vernacular or colloquial common name - e.g. 'Silchester Ware', 'Black-burnished ware', etc. It can also be a general descriptive comment about the fabric type such as 'coarse sandy ware'.

Figure 1: Pottery fabric record sheet

Pottery Fabric Record

SITE NAME	SITE CODE	FABRIC CODE
DISCRIBED BY	DATE	

DISCRIPTION

COMMON NAME			COLOUR		
FIRING	EXT. SURF.	EXT. MAR.	INT. SURF.	INT. MAR.	CORE
HARDNESS	SOFT	HARD	VERY HARD		
FEEL/TEXTURE	SMOOTH	SOAPY	SANDY	VERY SANDY	GRANULAR
FRACTURE	CONCHOIDAL	FINE	HACKLEY	TECHNOLOGY	
	SMOOTH	IRREGULAR	LAMINATED	Hand made ☐ Wheel made ☐ Uncertain ☐	

INCLUSIONS	FREQUENCY	SORTING	ROUNDING	SPHERICITY	SIZE	TYPE

SOURCE

DATE RANGE

NOTES

CONTEXTS/SSD/PHASES

CROSS-REFERENCED TO

PETROLOGY

AUTHOR

SAMPLES

SUMMARY

Figure 2: Pottery fabric record sheet (additional coding system)

Pottery Fabric Record-Addintional coding System

FABRIC CODE(S) FOR:

SITE NAME: N.G.R.:

SITE CODE:

POTTERY DATE RANGE:

DISCRIBED BY:

DATE EXAMINED:

FABRIC CODE		S	H	SHELL	
Modal Size / Quanity	Fine <0.25mm	Medium >0.25-1.00mm		Coarse >1.00-3.00mm	Very Coarse >3.00mm
Rare <3%	RF	RM		RC	RV
Sparse <3-10%	SF	SM		SC	SV
Moderate <11-25%	MF	MM		MC	MV
Common <26-40%	CF	CM		CC	CV
Abundant >40%	AF	AM		AC	AV

RANGE OF FABRIC CODES FROM THIS SITE:

S	H			S	H			S	H		
S	H			S	H			S	H		
S	H			S	H			S	H		
S	H			S	H			S	H		
S	H			S	H			S	H		

2.1.3 *Attributes relevant to the definition of fabrics*

Inclusions: There are two types of inclusions found in any fabric - those which originated as part of the clay matrix when it was dug out of the ground and are called 'naturally-included'; and those which were added by the potter and are called 'temper'. The terms frequently get misused in the archaeological literature, so be well aware of the differences. If it is not possible to determine whether natural inclusions or temper are present, please say so. Try to determine the differences wherever possible since this is important for an understanding of pottery manufacture (section 1.4.3), as well as production and distribution (section 1.4.4). Examination of the five categories following this section will help to determine 'natural' versus 'temper' type which is the last category. Both naturally occurring and deliberately added inclusions have the effect of opening up the clay during drying and firing. Ann Woods has suggested using the terms 'naturally occurring opening materials' and 'deliberately added opening materials' (Gibson and Woods 1997). Though this is a little long-winded it does acknowledge the technological value of both inclusion types.

Appendix 2 consists of descriptions prepared by Peacock (1977), and revised for this publication, of the major types of inclusions normally found in ceramics and how to recognise them. Before filling in this section of the form, obtain a bottle of dilute hydrochloric acid (10% HCI), a small magnet, a fine-pointed instrument such as a dental pick or needle, and either a binocular microscope or a hand lens. Then examine the inclusions and determine their identity - use the geological information available for the immediate area to focus attention on certain classes of inclusion, i.e. in Wessex, sandy fabrics and flinty fabrics are to be expected but only very rarely will there be examples of igneous rock-tempered fabrics such as the gabbroic Hembury or Glastonbury wares. Some of the most difficult inclusions to identify correctly are the clay pellets and mudstones (natural) versus grog (temper); the differences are best confirmed by petrological analysis. For calcareous matter, use the acid to test for any of these: calcite (including 'beef'), oolitic limestone, chalk and shell will 'fizz' when a drop of acid is applied. Be sure to place the acid on the inclusions to be tested: it is important to remember that on chalk sites, post-depositional concretions of chalk can occur on pottery and in particular on the hackly fracture edges; this will influence the effectiveness of this simple test.

Always remember to list the inclusions seen in the fracture and not only those visible on the surface. Voids are important evidence of the former presence of inclusions which may have been burned or leached out. Remember to see if flint or chert is burnt (calcined) or unburnt; the latter is likely to be naturally found in the clay deposits while the former may be crushed, burnt flint or chert deliberately added as temper.

Microscope magnification is calculated by multiplying the magnification in the eye piece by the magnification in the body lens, e.g. x10 eye piece multiplied by x2 in the body lens = x20 power magnification.

Frequency: This category describes the density of each of the inclusions identified in the fabric, not the surface appearance. Appendix 3 provides a visual representation of the following density classes:

R	rare	less than 3 %
S	sparse	3 - 9 %

M	moderate	10 - 19 %
C	common	20 - 29 %
V	very common	30 - 39 %
A	abundant	40 %+ (particularly appropriate for crucible and mould fabrics)

Sorting: Appendix 4 is a figure illustrating the sorting of sediments and the terms to use for the various forms of sorting. Remember to determine the form of sorting for each inclusion. This aspect is important for differentiating amongst geological deposits and for differentiating aspects of technology amongst fabrics.

Roundness: Appendix 5 and Appendix 6 illustrate visually aspects of rounding. Please abbreviate to 'A', 'Sub-A', 'Sub-R','R' and 'Well-R'. This can assist in differentiating between temper and natural inclusions.

Sphericity: There are only two categories; they are illustrated in Appendix 6.

Size: The size of inclusions is best described as between a range, such as 0.1-2.5mm or less than 0.5mm. Sediments have been equated into a grain size classification scheme which is presented in Appendix 7. With the use of a ruler and microscope, it may be possible to measure down to 0.125mm which is the 'fine sand' category. Anything below this it is unnecessary to measure and the comment 'less than' or 'silt-grade' will suffice.

The following is a recommended range of sizes and terms to use for pottery generally. For prehistoric pottery in particular and also many tempered wares more differentiation in the 'very coarse' range is important. It is recommended to use the term and a size range on the recording from (e.g. very coarse, 3.0 - 5.0mm) as presented below:

VF	very fine, silt	up to 0.1mm
F	fine	0.1 to 0.25mm
M	medium	0.25 to 1.0mm
C	coarse	1.0 - 3.0mm
VC	very coarse	larger than 3.0mm

Type: The choice is between 'natural', 'temper' or 'uncertain'. Clay pellets and iron oxides are natural. Mica, except mica-dusting which is a surface treatment, is usually 'very fine sand' size or less and therefore considered natural. Grog is always temper. Poorly- or well-sorted burnt, angular flint is usually temper. A fabric which contains both a sparse amount of sub-rounded quartz sand and a moderate amount of angular pieces of flint has both natural (sand) and temper (flint) inclusions. If the amount of flint is rare - sparse, it may be very difficult to determine if it is temper or not and therefore the term 'uncertain' is appropriate. Organic matter, especially if it is moderate to common in amount, is usually temper, but if rare to sparse is probably naturally-occurring. Difficult inclusions are sand and shell: they can be either type. It is often helpful to obtain samples of possible clay sources which may give some idea of inclusions which occur naturally in the local area.

Source: There are six choices here: 'local' which means a likely source for the inclusions has been found within a 10km radius of the site where recovered; 'non-local/regional' which means that a source has been found or is likely

somewhere in the region or general surroundings, but is definitely not from within the 10km radius; ‘regional’ which means that the source is too generalised to determine within the region - the types of inclusions are too common in a variety of different places all over the area; ’British’ which means somewhere in Britain outside the regional zone; ‘foreign’ which refers usually to mainland Europe; and ‘uncertain’ which speaks for itself.

In contrast, if you know what the source is or is likely to be, please give a full reference. Also include the distance in kilometres from the archaeological site to the source if known. Arnold (1981) explains why this is important.

Petrology: Fill in if there is a specialist report available. An example of a suitable format for presenting a fabric type in fiche/cd-rom or archive is presented in Appendix 10.

Hardness: If a sherd can be scratched with a fingernail, then it is soft. Otherwise it is hard or very hard. ‘Hard’ can be scratched by a metal blade but not a fingernail, while ‘very hard’ should only be used for overfired or stoneware-like material. This may need to be refined to indicate ‘easily scratched’ and ‘not easily scratched’. If your pottery has undergone significant post-depositional alteration, please indicate this as it will affect the hardness classification.

Feel and Texture: ‘Smooth’ is a common fineware texture, where the amount or size range of sand inclusions is small - such as for micaceous wares. ‘Soapy’ is typical of the textural feel of limestone, shell-gritted or grog-tempered wares. ‘Sandy’ and ‘very sandy’ are the commonest textural types and have a very distinctive sand-papery nature, while ‘granular’ has a much more gravelly feeling and may be particularly relevant to some Food Vessel and Urn pottery of the Bronze Age, particularly in upland Britain. Often it may be necessary to use more than one term to describe your material. Although this category usually refers to the surface of the sherd, many types of pottery have surface finishes which disguise this aspect, and therefore it is necessary to look at the fresh fracture to determine fabric texture. In many ways, ‘texture’ and ‘fracture’ are inter-related.

Fracture: This is the nature of the broken section of the sherds in each fabric. It can only be determined on a fresh fracture. Break off at least one tiny piece of at least one typical sherd in the fabric to check for this characteristic. This can be done using long-nosed or other pliers. ‘Conchoidal’ means that the fabric breaks with curved, shell-like striations, like broken wine vessel glass or flint surfaces; ’smooth’ is flat or slightly curved and has no visible irregularities, or a very dense, non-porous appearance; ‘fine’ has irregular, small closely-spaced irregularities or porous structure; ‘irregular’ has larger or more widely spaced gaps or porosity; ‘hackly’ has an uneven, rough break typical of sandy fabrics with spaces created between clay matrix and inclusions; and ’laminated’ has fractures in layers like slate or shale.

Technology: The choices are ’hand-built’, ’wheel-thrown’ and ’uncertain’. These terms are explained in, for example, Gibson and Woods (1997). It is important to record this variable for assemblages of transitional Late Iron Age/early Romano-British date, where both hand-built and wheel-thrown vessels might occur together. The term ‘hand-made’ should be avoided as both coiled and wheel-thrown pots are, in fact, hand-made (as indeed are thumb or moulded pots). The vast majority of pots in prehistoric Britain are hand-built and tell-tale traces such as join voids or coil breaks can often be seen in some fractures (Gibson and Woods 1997; Gibson 2002a).

2.1.4 Other relevant factors to record

Colour: There are four regular choices for this category: the orange/brown/red spectrum, the pale pink/buff/off-white spectrum, white, and the black/grey/uncertain spectrum. The first three of these terms describe the nature of the clay matrix when it has been fully oxidised (relatively iron-rich, iron-poor, or iron-free), and the last when the fabric is unoxidised, incompletely oxidised (or reduced) or smoked (see below). Therefore, 'colour' is closely related to 'firing' - see below. A fabric can easily vary between any of the above so one or two of these terms may be included in the record. Only the test firing of an incompletely oxidised sherd will let you know its true clay matrix colour. The main pitfall in this macroscopic analysis (which leads many analysts to ignore colour in the definition of fabric) lies in the fact that all prehistoric pottery (with the exception of the immediately pre-Roman Iron Age) is open fired. Atmospheric conditions can vary within bonfires and accidental effects such as smoking or smudging can give the appearance that pots have been unoxidised or reduced where in fact they are oxidized. Also as a consequence of this open firing is the fact that a single pot may have a very blotchy coloured surface ('fire-clouding') ranging, for example, from red to black on a single vessel.

Firing: There are three recommended choices for this category: oxidised (OX), unoxidised or incompletely oxidised (UN) or irregularly fired (IR). It is also important to record instances of over- and under-firing, as these can be significant indicators of skill. Oxidised means having been fired in an atmosphere 'in which the amount of oxygen is more than required to combust the fuel' (Rye 1981, 146; Gibson and Woods 1997, 216). Use Appendix 8 for assistance and Rye (1981, fig. 104) for a full explanation. The variation between interior, exterior and core firing are related to temperature, and as such may provide valuable technological indicators and will need to be recorded separately.

Rye (1981, 115-7) summarises the results of varying firing conditions on colour:

- Uniform cross-section (other than black) – fully oxidising conditions, no organic matter in vessel. Surface colour variations result from temperature differences;
- Core grey or black, surfaces and subsurfaces variously coloured, diffuse margins – incomplete oxidation, organic material present;
- Uniformly black – reducing or neutral atmosphere (*but see below*); may indicate deliberate restriction of air; absence of organics and a fine matrix may prevent black cores while presence of organics leads to grey or black throughout; note the effects of reducing gases from cooking in blackening surfaces of completely oxidised vessels.

Note that the term 'reduced', which has been used for many years to indicate an unoxidised condition of firing, is a complicated matter which is currently being researched (David Dawson, pers. comm.). Reduction is thought to take place above c.850^{O}C and needs to be identified using Mossbauer spectroscopy (Rye 1981, 118). This is significant because most prehistoric pottery is fired to less than this temperature. Unfortunately many archaeologists do not understand the difference between 'black' and 'reduced' and the two terms are often (wrongly) used interchangeably (Gibson and Woods 1997, 234-6). Furthermore, most prehistoric pottery is open fired and it is difficult to achieve reducing conditions in a bonfire where atmospheric conditions change frequently during the firing process. Pots may achieve a black or dark colour by being partially reduced, have isolated patches of reduction or, more likely, be smudged (Gibson and

Woods 1997, 251). The black core seen in many prehistoric sherds is a result of incomplete oxidation and terms such as ‘reduced core’ are erroneous. The term ‘reduced’ or ‘reduction’ should be avoided unless detailed analysis has proven the process to have occurred.

Date Range: It is best to fill this in when dated parallels for the vessel types have been determined.

Notes: Anything which may be useful in the identification of this material or anything unusual can be included here such as ‘only used for hand-built vessels’, or ‘used for both wheel-thrown and hand-built vessels’ or ‘only with burnished sherds’. Techniques of firing and aspects of manufacture, with forms, surface treatments and decorative motifs are also frequently included in the overall general description of ‘fabric’. This is clearly indicated in the archive level format which is presented below, although the information has to be collated from the subsequent analysis of forms, surface treatments and decorations.

Contexts, Phases and Site-Divisions: After all the pottery analysis is completed it is useful to have a record of the presence of this fabric by contexts, phases, or areas of the site, as appropriate. This is best done using a correlation table as part of the archive which may be selected for fiche/cd-rom publication.

Cross-referenced to: This is important for understanding regional production and distribution systems for all periods. It is the essence of a good recording system and is vital for any comparative work to be included in the text report. It includes extremely similar or identical fabrics checked macroscopically to be the same.

2.2 Form

The creation of form types is not easy. There tend to be two attitudes to this activity: ‘splitting’ and ‘lumping’. The former results in types and sub-types which can be as large in number as there are vessels (i.e. each vessel is a form type), while the latter tends to give very broad definitions which can encompass large variations in form. Each approach has to be viewed with caution and judged on the nature of the enquiry being made of the collection, the quantity and quality of the collection, and any work on similar collections.

Extreme splitting can waste time and provide no comparative information or patterns, while extreme lumping can lose important variations and subtleties within the collection. Before you begin, it will be very useful to examine published collections to see if you can understand the goal of the specialist’s type series or form divisions - why they did what they did and whether it was useful and informative. If so, then adopt the scheme or a modified version if it suits your material. Otherwise create your own type series of forms, cross-referenced to other published work.

The definition of form needs to be considered at two levels: overall vessel form and form elements.

2.2.1 Vessel Form

For later prehistoric material, a series of keywords has been determined which can be used to name a general form type. This list will be increased through use. The *PCRG* recommends using this variable when the data is to be computerised. It is sensible to sub-classify the vessel forms according to the range present.

bowl	jar	saucepan pot	cup	vessel
bowl, carinated	jar, storage	lid	beaker	dish/bowl
bowl, round-bodied	jar, ovoid	sieve	dish	cup/bowl
bowl, flanged	jar, bead rim	strainer	tazza	jar/bowl
bowl, conical	jar, everted rim		plate/platter	bowl, hemispherical

For earlier prehistoric material, the range of forms is more restricted. Round bottomed bowls predominate in the early and middle Neolithic. These may be carinated or plain and open, closed or neutral (Cleal 1992). The term Carinated Bowl (capitalized) is usually reserved for the sharply shouldered bowls of the primary Neolithic while carinated bowl (lower case) may apply to any shouldered vessel. In the later Neolithic and Bronze Age, amongst the Grooved Ware and Urn ceramics, tub, barrel and bucket forms predominate. Food Vessels of the early Bronze Age may broadly be categorized as Vase or Bowl types with formal and/or regional subdivisions. Often the class of pottery itself may describe the form, for example Collared or Cordoned Urns (Gibson and Woods 1997; Gibson 2002a).

2.2.2 Form elements

Frequently, and particularly with earlier prehistoric pottery, sherds are insufficiently large to define accurately the overall form of the vessel, but may nevertheless be diagnostic of date. The following is one recommended system for the computerised recording of forms; it can also be used for a manually-run system. This system and others similar to it have been used in the recording of large, later prehistoric collections. It is not the only system in use, however. Others may be equally simple to use.

The diagnostic shape of each vessel part with recognisable form (sometimes referred to as a *featured sherd*, i.e. a sherd with a feature - whether rim, base, handle, spout, decoration, etc) can be assigned an alpha-numeric code number (e.g. R35) which is distinctive to your assemblage. This field is often multiple-entry if a total or partial profile is present for a single vessel. For example, there may be an R23 rim type, a B4 base type, some decorated body sherds (D1), some angled sherds (A6), some plain body sherds (P1) and an H5 handle all from a single vessel: 'R23;B4;D1;A6;P1;H5' will be the entry in the form field. These codes may be used in a computerised system either using separate fields for each vessel part or a single multiple entry.

The codes can be cross-referenced to similar form codes from other projects. Where sufficiently well defined and suitable major form series already exist, these should be used rather than reinventing and recoding them.

Typical letter codes for form elements include:

- R = rim type
- B = base type
- H = handle attachment type (including lugs and bosses)
- A = angled body sherds, such as carination or shoulder
- S = spouts, including bunghole sherds
- P = plain body sherds
- D = decorated body sherds displaying no other features
- F = foot type
- N = neck

Not all projects will necessarily require all of these form elements to be defined. Reference to a visual type series of forms is an essential part of this exercise and should be included in the archive in the form of a pattern book. It is usually the recorder who is expected to prepare an accurate drawing of the form type at 1:1 scale. This form type series can be related to published work or a site specific pattern book, which should be published as either a type series or in key groups of contextually related sherds or vessels.

2.3 Quantification

There are many ways to record this variable but it must be consistent and explained in the methodology section of any report. The main aim is to be able to summarise the amount of material by fabric, form, etc. or any combination of these and to provide information about the mean sherd size (using number and weight) within a context or feature, again by fabric, etc.

2.3.1 Number of Sherds

Count number, count fresh breaks as one; old breaks within same stratigraphic unit are normally recorded as cross-joins (see below) or as single sherds.

2.3.2 Weight

Record in whole grammes. Sherds with all the same attributes from a context can be weighed together, but often, especially if a very full range of variables is being recorded, it will be necessary to weigh individual sherds.

2.3.3 %Rim, min/max

The percentage of rim present is usually best represented as within a minimum and maximum range. This information is recorded to the nearest whole percentage, but it is clearly linked to the determination of diameter (Diameter Rim, min/max described below). The percentage present is usually determined using a circumference rings board or diameter chart giving radial divisions of percentages.

The main purpose of determining the percentage of the diameter is to represent more accurately the quantity of material present for comparison within and between contexts, phases or sites. These measurements can sometimes be used in the determination of Estimated Vessel Equivalents (Orton 1980). As already discussed, however, the use of the 'EVE' system is often not appropriate when recording earlier prehistoric pottery. Other useful methods for percentage comparisons are by counting sherds or weighing sherds by fabric type, but this is not appropriate for studying form changes.

2.3.4 Extent

If the sherds being measured are rims or bases, it is possible to include the extent present. This variable is used to indicate how much information was available to determine which form the sherd came from; it is an also an indicator of the level of reliability in the decision-making process, and why it may only have been possible to give a very general form type. A simple way of coding this is as follows:

R	if only the rim and possibly a bit of the neck of a vessel is present
R+	if the rim and neck zone and possibly some of the vessel body form are present
B-	if only the base, and undiagnostic vessel body sherds are present
B+	if the base and diagnostic vessel body sherds present
T	if the total vessel profile is present

The numerical percentages of these within a site assemblage will be a useful measure of the quality of preservation.

2.4 Vessel dimensions

2.4.1 Diameter of Rim (min/max)

As for the percentage rim present, use a circumference rings board and measure the external rim diameter to the nearest ten millimetres (e.g. 160-170) in this field. If the rim is represented by a large proportion, such as over 25%, or was made in a standard mould-form, then it may be possible to be quite precise about the rim measurement and the same entry may be made for both minimum and maximum in this field. The hand-built nature of the majority of prehistoric pottery (particularly of the Neolithic and Bronze Age) means that rim circumferences can be very irregular.

The purpose of measuring rim diameters is to find out the size range of vessels in that particular form and fabric combination. It is important also to realise the significance of rim diameters as orifice measurements: the opening of a container provides information about the function of that vessel because it is the space through which materials that relate to its function must go. A small diameter opening is appropriate for the restricted flow of liquids or the wide diameter of an open bowl for serving. However, the calculation of the orifice is slightly more difficult than the calculation of the rim diameter, and consequently it is the latter which is traditionally measured.

2.4.2 Diameter of Base (min/max)

As for Diameter of Rim above; measurement is exterior of base. %Base, min/max is not thought to be necessary to record. This measurement is, of course, irrelevant for most early and middle Neolithic vessels and for some crucibles.

2.4.3 Thickness

Vessel wall thickness (VTH) is one of the variables used to assess vessel function, in association with fabric, form, orifice and size of vessel (Braun 1983).

One technique of recording VTH is to code measurements into 2mm divisions which allows general trends to be calculated and presented via simple bar graphs showing differences or by cumulative percentage frequency curves for comparison of vessel types or fabric types or for examining spatial or chronological variation (Morris 2000, 2001).

It is important to note that wall thickness can vary considerably within a single vessel, particularly in Neolithic bowls and early Bronze Age urn types. But where consistent wall thicknesses can be demonstrated or reasonably inferred, comparison of VTH codes can indicate variation in types of vessels being made or to suggest functions of vessels in different fabrics. They can be used when only body sherds exist; they can show that different types of vessels were found in different locations on a site, or at different times during a site's occupation; they can demonstrate that different types of fabrics require different wall thicknesses for performing the same function, or the same fabric requires different wall thicknesses for different vessel functions.

2.4.4 Height (min/max)

This is used when a total profile is present and is essential for determining vessel capacity and function as part of understanding the range of an assemblage.

2.4.5 Girth (min/max)

This may be used when the girth is present, which is usually when there is a total or nearly complete vessel, and as with height, is essential for determining vessel size and function as part of an assemblage.

2.5 Surface treatment and its position

The range of surface treatments known to exist for prehistoric pottery found in Britain include smoothed, wiped, burnished, slipped, knife-trimmed, finger smeared, the application of crushed iron-rich matter, dry coating, painted and scraped. New treatments will undoubtedly be identified in the future. The kind of treatment and its location on the vessel are both important. The latter is useful when investigating the amount of labour input into production, which can be used to explore site status (Feinman *et al.* 1981) and vessel function (Lambrick 1984).

2.6 Decoration and its position

'Decoration' means 'decorative technique', or the technique used to create a pattern; patterns are so varied from area to area that it is best to leave the range open as project specific. It will be necessary to accompany this list of patterns with illustrations either within key groups or for publication in fiche/cd-rom.

applied	wiped	impressed	scored	barbotine	slipped
squeezed	incised	infilled	brushed	tooled	slashed
moulded	burnished	combed	scratched	embossed	painted
perforated	stabbed	pinched	stamped	excised (carved out)	rusticated
finger smeared	roughcast	finger impressed	relief	finger-nail impressed	furrowed
rouletted					

Within some of these categories, particularly the impressed category, it may be necessary to refine further the description of the decoration to include the implement/material used to make the impression: for example, twisted or whipped cord. This is particularly so in the impressed ceramics of the middle Neolithic and early Bronze Age where a great variety of impressions are encountered. Attention should also be paid to detecting the traces of inlay within some impressions.

The recognition and definition of design motifs and patterns varies regionally; therefore, this aspect will not be developed in this document (see Cunliffe 1991; Elsdon 1989).

2.7 Manufacturing technique

Various techniques, and how to recognise them, are described in detail by Rye (1981, 66-83) and in Gibson and Woods (1997). This is an important aspect of production systems and needs to be given greater significance in all publications. It is particularly important to record this data for projects which

include periods of major social and economic transition such as the later Iron Age to early Roman period. Recognised techniques include:

- applied or attached
- coil (or strap or ring)-built
- luted
- mortised
- moulded
- pinched
- pulled
- slab-built
- wheel-finished
- wheel-thrown

2.8 Residues and their positions

This variable includes not only evidence of residues in relief such as sooting, limescale and food deposits but also recessed evidence such as pitted interior surface (due to contact with acidic foodstuffs) or interior wear marks. Hally (1983; 1986) provides details. Position is worth recording because it could tell about how the pot was used (Lambrick 1984). The attributes include:

- abraded (interior surface; exterior surface)
- limescale (or similar off-white residues, i.e. milk; beer)
- pitted (on interior only)
- residue (includes slags and pigments, as well as food)
- sooted

It is important to recognise that *pitting* is due to contact with acidic foodstuffs, and will consequently only occur on vessel interiors. It is also to be borne in mind that not all residues are visible. Trapped organic residues, particularly lipid residues, may be within the fabric of the pot and are therefore invisible. These residues will only be detectable chemically.

2.9 Perforations and their positions

This field is for the recording of holes made in vessel walls. Perforation types include single, paired (for repairs), numerous and not necessarily paired (strainer), closely spaced or numerous closely spaced (sieve). Recording whether the perforation was created pre- or post-firing is important when determining the difference between intended and actual vessel function. Stilborg (2006) discusses perforations.

2.10 Firing conditions

The firing conditions which are inserted in this field are similar to those discussed for the Pottery Fabric Record (section 2.1) and the same degrees of caution must be exercised in interpreting the pots.

- oxidised
- unoxidised, incompletely oxidised, or reduced
- irregularly fired
- overfired (sintered)
- underfired

- spalled
- adjusted firing: unoxodised surface over oxidised band or core

2.11 Condition of sherds

A measurement of roundness could be adopted to determine a standard of recording for this variable. Otherwise, simply ‘fresh’, ‘average’, ‘worn’ and ‘very worn’ have proven to be effective categories. A more detailed system might include fresh, slight abrasion, light abrasion, heavy abrasion, flaked, post-depositional pitting, and others.

2.12 Re-use

The re-use of pottery as spindlewhorls, or as counters in the Roman period, has long been recognised as an aspect of pottery re-use. In addition, flagons and amphorae are known to have been cut down in size and re-used. In the early prehistoric period re-use is most often limited to the recycling of ceramic material as grog (Cleal 1995; Gibson 2002a).

2.13 Cross-context sherd joins

The presence of sherds which join from different contexts should be investigated and recorded to assist in understanding depositional processes and chronological relationships.

2.14 Illustration Number

This number will be inserted when available. Please include the museum catalogue number here if appropriate. Distinct numbers may be needed if a separate set of sketches is made to help identify particular records.

2.15 Comments

Most specialists feel it is important to take notes about the subtle variations which can be observed amongst all prehistoric pottery. Therefore, if a computerised system is being used, it is recommended that a free-text field be allowed to accommodate this aspect.

3 REPORTING, ILLUSTRATION AND CURATION

3.1 What to record and quantify

The previous section described the range of variables which could be identified from the material and gave an indication of the possible attributes. Not all variables are found amongst all collections of prehistoric pottery; selection of those appropriate to the material and to the questions to be answered is essential: for example, dating of phases; changes through time and space; trade and exchange; site formation processes. If the pottery under analysis is some of the first of that period in an area, then there will be a great need for full analysis and recording, particularly if the site is well-stratified or spatially distinctive. Therefore, it is necessary to determine what is important and what is possible using the criteria for assessing site assemblages defined in Part 1 in order to select the variables for recording.

3.2 What to write

The form of pot reports varies considerably according to the level of analysis appropriate to the assemblage; the period or periods of study; the region; and client, curatorial and other professional requirements. It would not be appropriate for the *PCRG* to be prescriptive in attempting to dictate reporting form, but there are a number of basic requirements which any competent report should contain:

- The nature of the assemblage, including total number and weight of sherds;
- The aims of the report;
- The methods of analysis employed (e.g. these guidelines);
- Description of fabric types;
- Description of form types;
- Description of surface treatments and decorations;
- Discussion of evidence of manufacture, function, use and disposal;
- A detailed discussion of the assemblage in its own terms;
- A general discussion and assessment of the assemblage in its regional context;
- References.

Many examples of exemplary reports from various regions and chronological periods are given in the bibliography.

The Pottery Fabric Records, the Pottery Data Record, the pattern books and the project specific codes will form part of the archive.

3.3 Choice of pottery to illustrate

Selection of examples for published illustration will depend on the post-excavation research design. Indicate what is vital to illustrate the text, and also what would enhance the text. Given the smallness and variability of some earlier prehistoric ceramic assemblages, it may be that in some cases 100% illustration is appropriate. For later prehistoric assemblages it is recommended that an illustrated type series be published. Usually it is only possible to illustrate groups of pottery representing a phase or feature; these groups are known as *key groups.*

3.4 Catalogue or listing of illustrated pottery

Illustrated pottery must be accompanied in the text by a catalogue or list which includes a unique number (the Pottery Record Number or PRN), the form, fabric, other variables and context or feature number for each illustrated vessel or sherd. This may be done by coded information with each sherd or vessel illustrated or in the caption if a separate listing is not possible. If both hand-built and wheel-thrown vessels are present in an assemblage, it may be very helpful for the reader to indicate which vessels are which in this list. Alternatively, this can be shown on the illustration as can the amount of vessel present. Many researchers find it useful to bag illustrated material separately within the assemblage when preparing the collection for archival storage.

Guidelines for the production of prehistoric pottery publication drawings have been produced (Green 1987); various aspects of pottery illustration and its relation to the needs of specialists are discussed in Hurman and Steiner (eds) (1997).

3.5 Curation

Try to store the pottery in bags by fabric type and within a context. Once analysis has been carried out, it should be possible to locate specific sherds, and accurate cross-referencing between sherds and records is crucial. Some museums prefer or require that illustrated material be stored separately from the rest of the pottery from a context. Whatever the curatorial policy, the illustrated sherds should be cross-referenced and easily identifiable.

Sherds that may be intended for biomolecular studies such as lipid analysis, should be stored in a plastic/polythene free environment as plasticisers may contaminate the sherd. Ideally the sherd should be insulated in clean aluminium foil.

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APPENDIX 1: POTTERY FABRIC CODING SYSTEM

This is just one example of the many possible pottery fabric coding systems which could be used for prehistoric pottery. The letter codes denote the type of inclusion, whether temper or natural inclusion.

Code	Description
FL	Flint
GR	Grog
IO	Iron oxides
LI	Limestones such as oolitic limestone
CH	Chalk
MI	Mica, including micaceous clay matrices; this may have to include fine sand grains which cannot be identified as such macroscopically.
SH	Shell; this is for fabrics where shell is clearly dominant; it is unlikely that you will be able to distinguish fresh shell from fossil shell without specialist assistance.
CP	Natural clay pellets (not grog)
QU	Quartz or quartz sand
QT	Quartzite
RO	Rock fragments, including metamorphic, igneous and sedimentary; if petrologically identified, specific codes may be used (eg ‘GN’, ‘GD’).
GB	Gabbro
GN	Granite
GD	Granodiorite
BA	Basalt
SS	Sandstone
VE	Organic matter (vegetable matter; charcoal and carbonaceous matter can be included here).
IV	Indeterminate voids; only use when impossible to determine shape of vesicle or by consultation with specialists.

Combinations of codes may be employed for fabrics incorporating several main inclusions.

APPENDIX 2: KEY TO VISUAL IDENTIFICATION OF PRINCIPAL INCLUSIONS

(after Peacock 1977)

Preliminary

1. No inclusions visible: voids……Go to A
2. Inclusions react with dilute hydrochloric acid……..Go to B
3. Inclusions homogeneous; do not react with acid……..Go to C
   (grains appear to be composed of one type of mineral)
4. Inclusions homogeneous; do not react with acid……Go to D
   (grains clearly composed of several types and colours of mineral)

A (Voids)

1. Voids plate-like, sometimes curved and with striations …….. Shell
2. Voids form perfect ovals or spheres, c. 1 mm across…….. Oolite or Limestone
3. Voids form rhombs …….. Calcite
4. Voids irregular …….. Limestone
5. Voids elongate with striations down length …….. Grass or Straw

B (React with Acid)

1. Plate-like, curved, laminated or with structure at right angles to surface…….. Shell
2. Inclusions for perfect ovals or spheres with concentric structure…….. Oolite
3. Inclusions form ovals or spheres non-concentric structure..……Well-rounded limestone
4. White or clear rhombs …….. Calcite
5. Irregular lumps, angular or rounded …….. Limestone

C (No Reaction with Acid): Homogeneous

1. Light-coloured…….. Go to C*
2. Dark-coloured…….. Go to CC**

C (Light-Coloured)*

1. Glistening flakes …….. White mica
2. Clear glassy grains harder than metal …….. Quartz
3. White glassy grains harder than metal …….. Quartzite
4. Clusters of white glassy grains not well-cemented together ……..Quartz sandstone
5. Dull white or light grains…….. Go to (a)/(b)

   (a) easily scratched with metal

   1. rhombs …….. Dolomite
   2. with curved structure …….. Calcined bone

   (b) not easily scratched with metal

   1. rectangular or subrectangular crystals, cleave well …….. Felspar

2. no visible crystal form, conchoidal fracture …….. Flint

*C** (Dark-Coloured)*

1. Glistening flakes …….. Dark mica

2. Red earthy grains …….. Go to (a)/(b)

(a) well-rounded

1. slightly magnetic, sometimes bright ochreous colour …….. Red iron ore

2. dull brown, clay-like …….. Clay pellets or mudstone

3. dull brown, clay-like but with laminations …….. Metasediment

4. reddish-orange, clay-like, rounded, soft …….. Grog or clay pellets

(b) angular

1. slightly magnetic, sometimes bright ochreous …….. Red iron ore/oxides

2. dull red-brown, clay-like …….. Grog

3. Black grains…….. Go to (a)/(b)

(a) shiny grains

1. 'metallic'; no crystal from, often well-rounded …….. Black iron ore

2. elongate rods, glassy, often striations down length…….. Prob. ferro-magnesian minerals

(b) dull grains

1. soft, earthy, angular …….. Grog

2. harder, flat grains sometimes laminated…….. Matasediment, slate, shale

3. not scratched with needle, no crystal structure, conchoidal fracture, angular…….. Flint

4. scratched by metal, hackly fracture, minute crystals…….. Basic igneous

5. soft, rectangular, laminated structure ……Organic and carbonaceous

4. Hard red grains …….. Go to (a)-(d)

(a) transparent or translucent ……..Quartz or quartzite

(b) opaque rectangular or subrectangular crystals, cleave well …….. Felspar

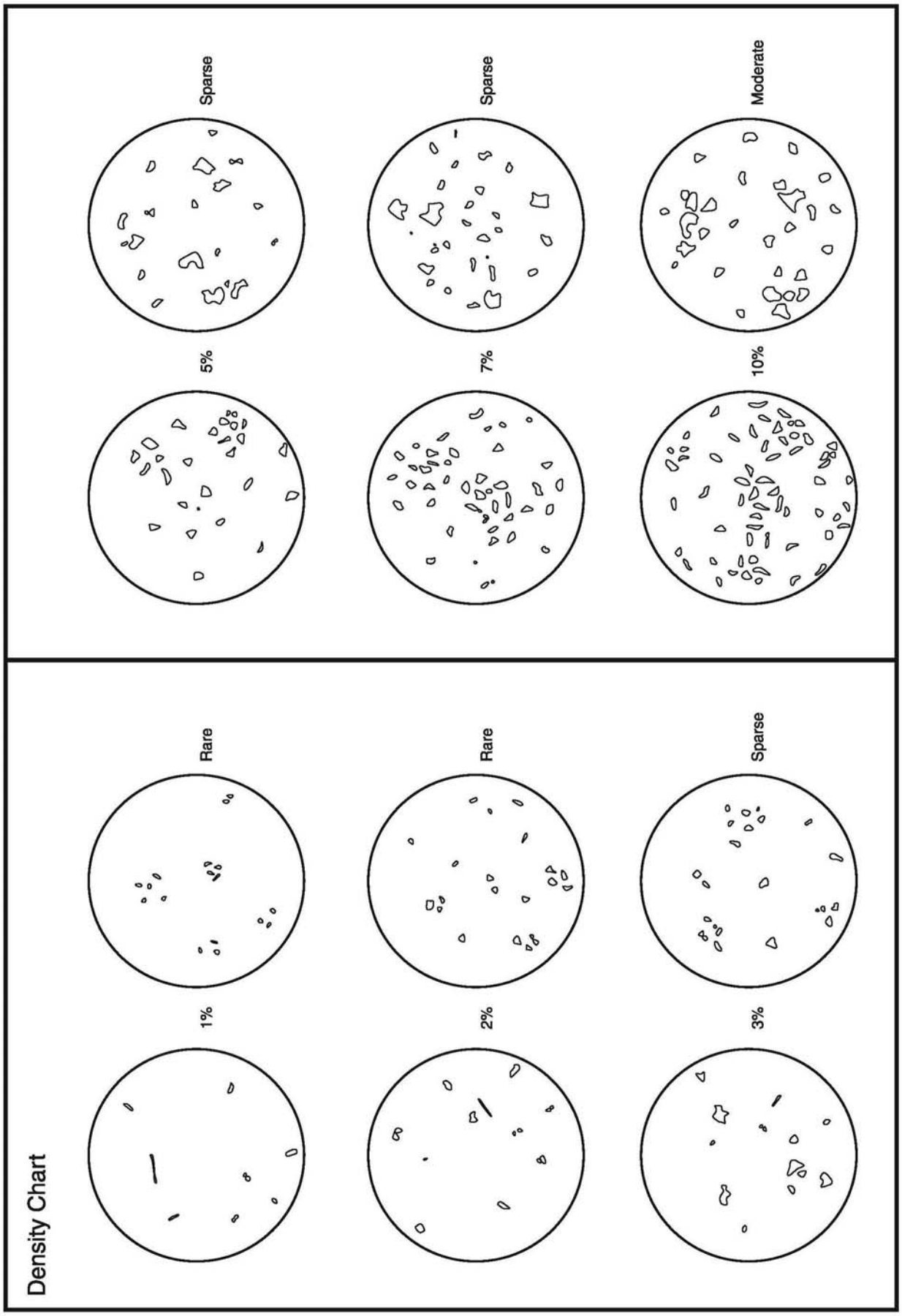
(c) opaque, conchoidal fracture …….. Flint

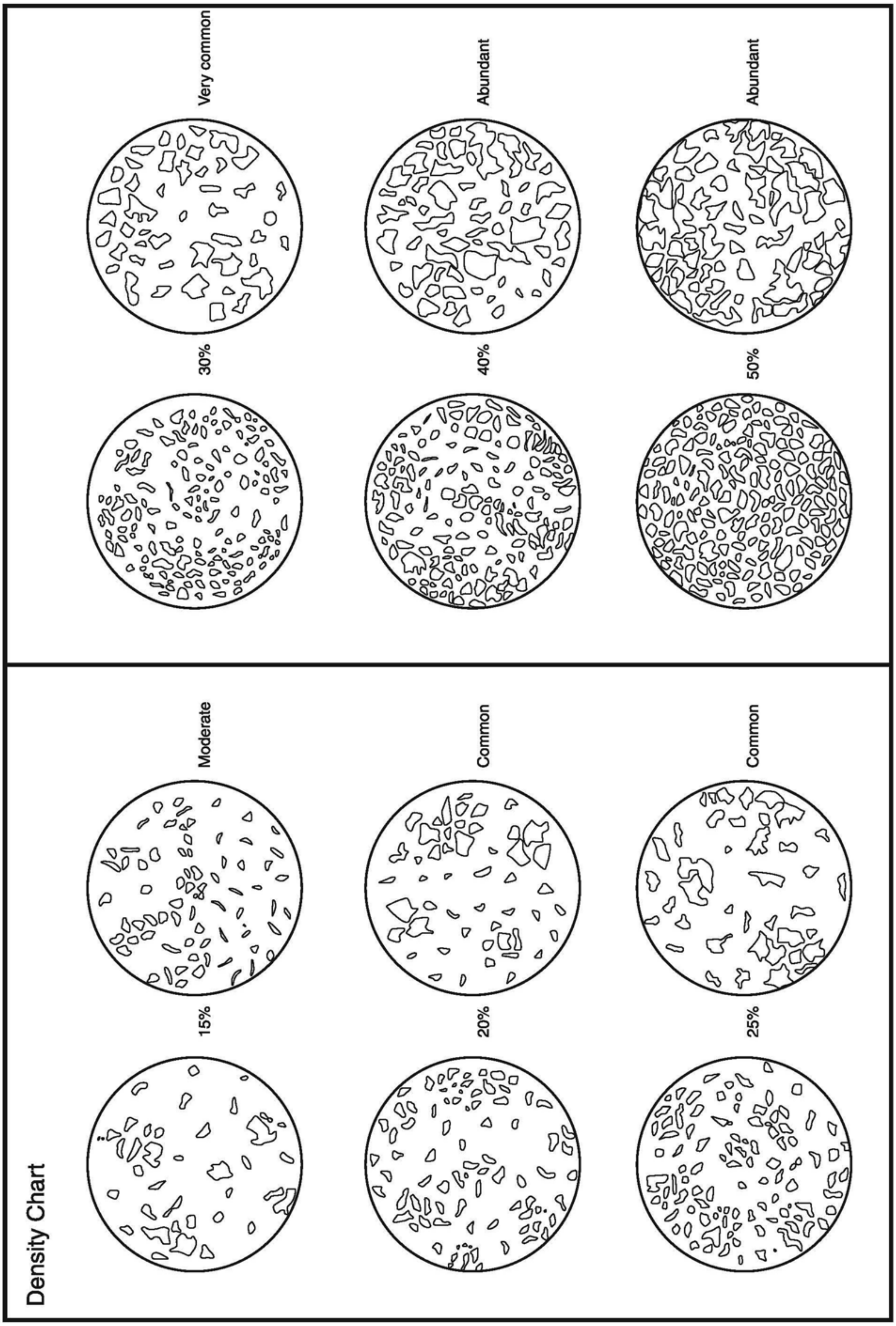
(d) scratched by metal, hackly fracture, minute crystals…….. Basic igneous

D (No Reactions with Acid): Heterogeneous Grains

…… Rock fragments difficult to identify; thin sectioning advised

APPENDIX 3: INCLUSION DENSITY CHARTS

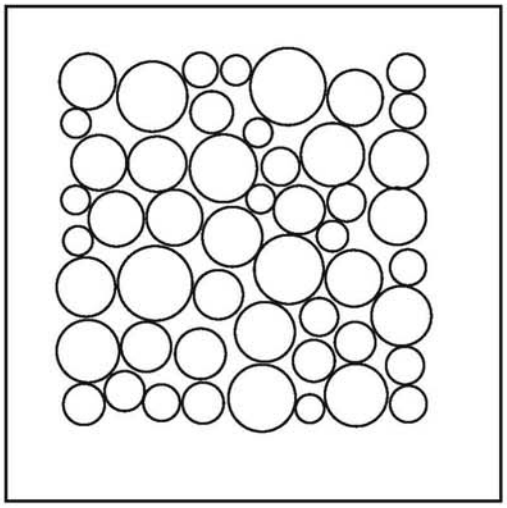




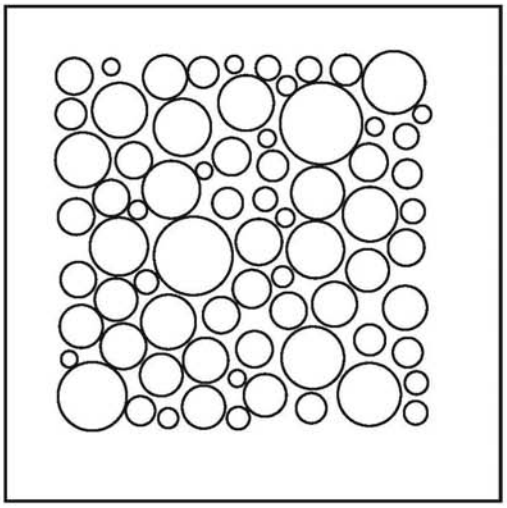
Density Chart
15%
Moderate
20%
Common
25%
Common
30%
Very common
40%
Abundant
50%
Abundant

APPENDIX 4: DIAGRAMS OF SORTING OF INCLUSIONS

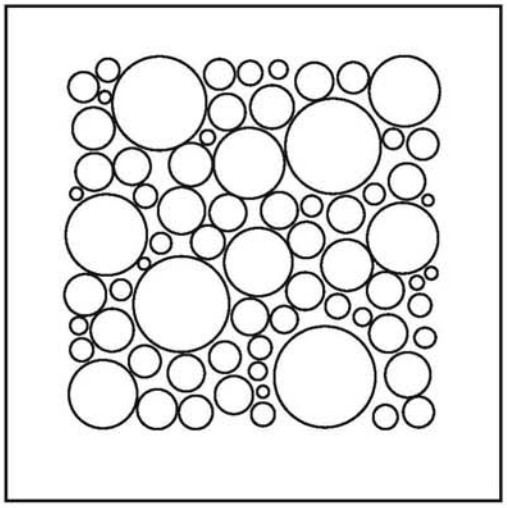
Sorted Sediments



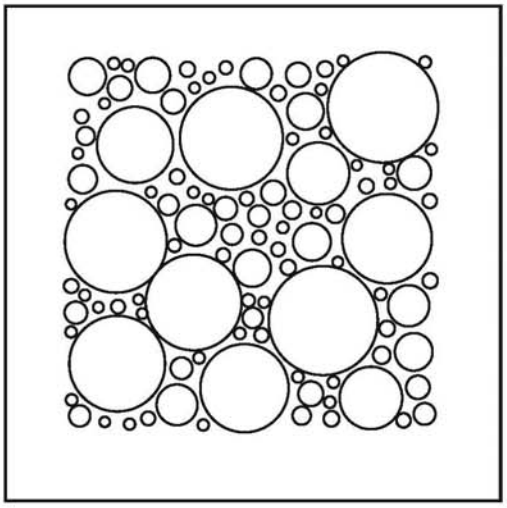
Very well-sorted



Well sorted



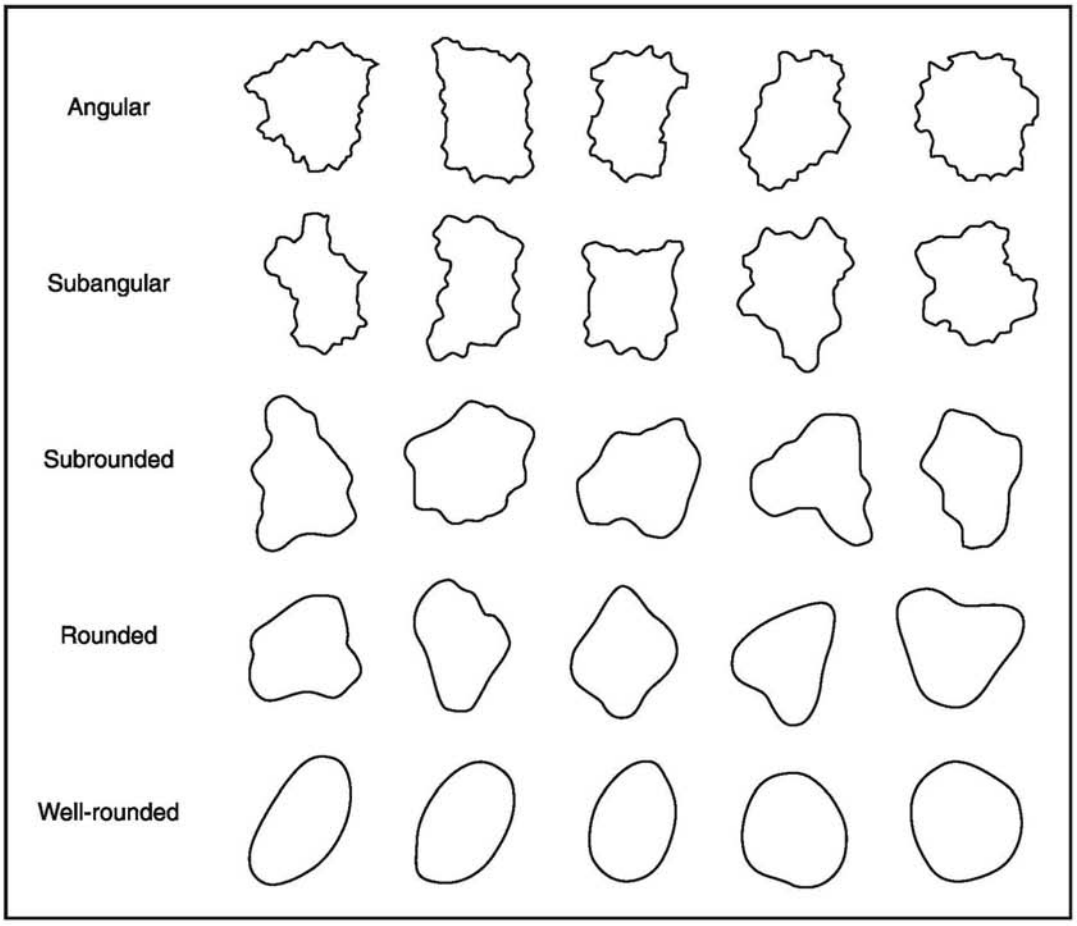
Moderately-sorted



Poorly-sorted

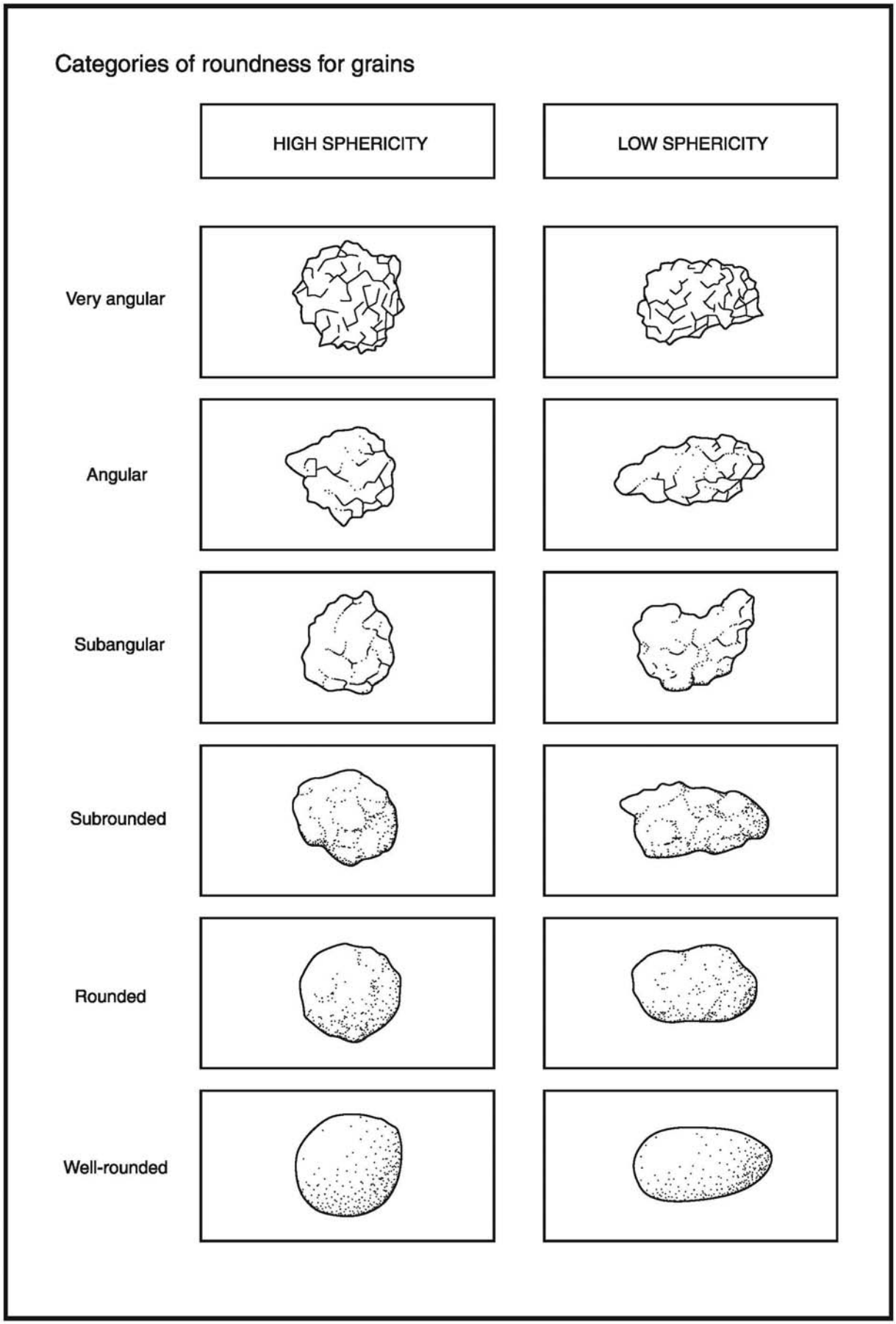
APPENDIX 5: INCLUSION ROUNDNESS CLASSES

Sorted Sediments



CLASS	DEFINITION
Angular	Strongly developed faces with sharp corners. Sharply defined, large reentrants with numerous small reentrants.
Subangular	Strongly developed flat faces with incipient rounding of corners. Small reentrants subdued and large reentrants preserved.
Subrounded	Poorly developed flat faces with corners well rounded. Few small and gently rounded reentrants and large reentrants weakly defined
Rounded	Flat faces nearly absent with corners all gently rounded. Small reentrants absent and large only suggested.
Well-rounded	No flat faces, corners, or reentrants discernible, and a uniform convex grain outline

APPENDIX 6: CATEORIES OF ROUNDNESS FOR GRAINS

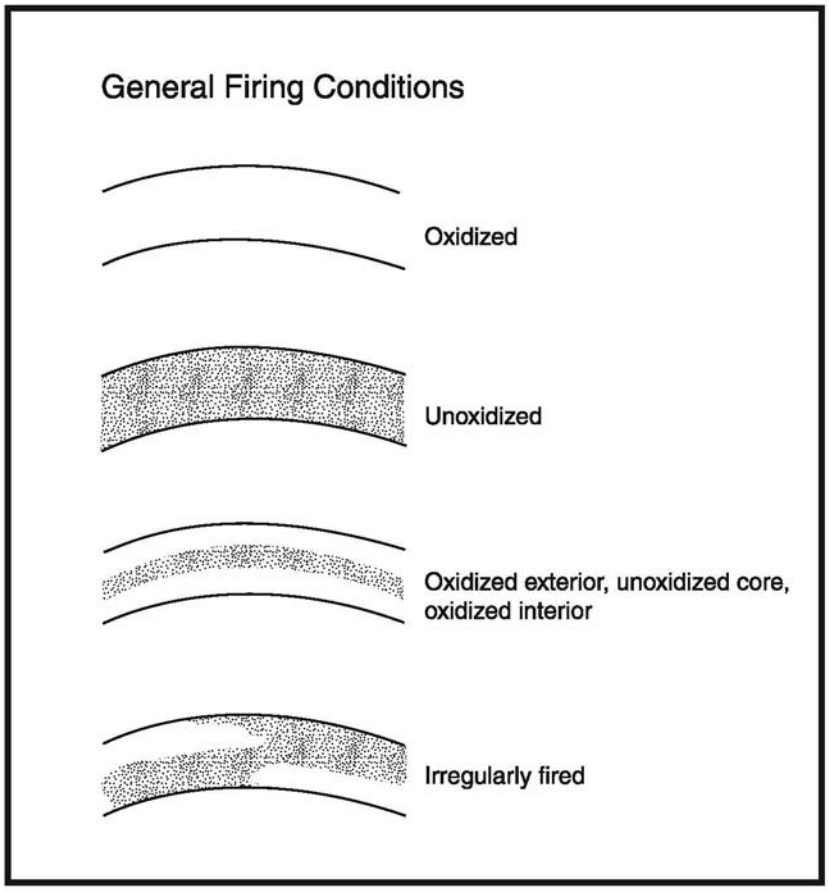


APPENDIX 7: GRAIN-SIZE CLASSIFICATIONS

The following table (after Adams *et al* 1984, table 1) gives the size in millimetres of the boundaries between broad descriptive terms for different classes of sediment.

Size in mm. of class boundary	***Class term***
	Boulders
256	
	Cobbles
64	
	Pebbles
4	
	Granules
2	
	Very coarse sand
1	
	Coarse sand
0.5	
	Medium sand
0.25	
	Fine sand
0.125	
	Very fine sand
< 0.0625	
	Coarse silt to clay

APPENDIX 8: DIAGRAM OF GENERAL FIRING CONDITIONS



APPENDIX 9: FURTHER READING

This list cannot pretend to be comprehensive. Since the previous revision of these Guidelines was issued in 1997, many hundreds of publications have appeared concerned primarily or partly with prehistoric ceramics: excavation reports; regional syntheses; methodological and interpretative advances; to say nothing of work of broader scope touching on issues germane to the study of pottery (for instance studies of material culture, style, symbolism, technological aspects of human agency and so on).

As a result, the material presented here is intended to provide a way in to the study of particular topics, periods or regions. It is drawn from the collective knowledge and specialisms of those members of the PCRG who chose to contribute to it, and as such reflects their varied biases, predilections and interests. There is no pretence at a 'party line' in terms of a particular philosophy of science or interpretative position; no one specialist is likely to find all of the material listed here useful.

PART 1: THEMATIC

Pottery Analysis and Interpretation: General Introductions and Overviews

Anderson, A., 1984, *Interpreting Pottery*. London: Batsford.

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