Ceramic Petrography

The Interpretation of Archaeological Pottery & Related Artefacts in Thin Section

Patrick Sean Quinn
Thin section photomicrographs of archaeological ceramic samples. Grog temper in Late Prehistoric pottery from southern California (left) and secondary calcite deposition within voids in Anglo Saxon pottery from England (right). Crossed polars. Image width = 3.8 mm.
## Contents

1 Introduction to Archaeological Ceramic Analysis & Thin Section Petrography
   1.1 Thin Section Ceramic Petrography 4
   1.2 A Brief History of Ceramic Petrography 10
   1.3 Publications & Academic Forums 16

2 Sampling, Thin Section Preparation & Analysis
   2.1 Sampling Archaeological Ceramics 21
   2.2 Thin Section Preparation 23
   2.3 Analytical Equipment 33
   2.4 Other Resources 35

3 Composition of Archaeological Ceramics in Thin Section
   3.1 The Clay Matrix 39
   3.2 Particulate Inclusions 44
   3.3 Voids 61

4 Grouping & Characterization of Archaeological Ceramics in Thin Section
   4.1 Visual Classification & Description 71
      4.1.1 Grouping 73
      4.1.2 Description 79
      4.1.3 A Modification of the Whitbread Descriptive System 80
      4.1.3.1 Inclusions 83
      4.1.3.2 Clay Matrix 93
      4.1.3.3 Voids 97
      4.1.3.4 Comments Section/Fabric Summary 100
   4.2 Quantitative Characterization & Statistical Grouping 102
      4.2.1 Textural Analysis 103
      4.2.2 Modal Analysis 105
      4.2.3 Data Collection 106
      4.2.4 Statistical Classification 111

5 Interpreting Ceramic Raw Materials & Provenance
   5.1 The Underlying Principle 117
   5.2 Interpreting Ceramic Raw Materials 119
   5.3 Resolution & Accuracy of Provenance Determination 122
   5.4 Objectives & Sampling 129
   5.5 Geological Literature 131
   5.6 Raw Material Prospecting & Analysis 131
   5.7 Quantitative Data 137
   5.8 Micropalaeontology 140
   5.9 Interpreting Provenance Data 142
6 Reconstructing Ceramic Technology
   6.1 Raw Material Selection 153
   6.2 Raw Material Processing & Paste Preparation 154
   6.2.1 Crushing, Cleaning, Sieving & Levigation 154
   6.2.2 Temper & Clay Mixing 156
   6.2.3 Ageing & Working 171
   6.3 Forming Methods 174
   6.4 Finishing 181
   6.5 Drying 185
   6.6 Firing 188
   6.6.1 Firing Temperature 190
   6.6.2 Atmosphere of Firing 198
   6.6.3 Firing Regime 200
   6.7 Ceramic Use & Function 203
   6.8 Post-Depositional Alteration of Archaeological Ceramics 204

7 Petrography of Ceramic Building Materials, Metallurgical Ceramics & Plaster
   7.1 Ceramic Building Materials 213
   7.2 Earthen Construction Materials 217
   7.3 Refractory Ceramics 219
   7.4 Other Ceramic Objects 221
   7.5 Petrography of Cementitious Materials 224
   7.6 Stoneware, Fritware & Porcelain 231

Appendix Petrographic Fabric Descriptions
   A.1 Unimodal Fabric Description 237
   A.2 Bimodal Fabric Description 239
   A.3 Fabric Summary 242