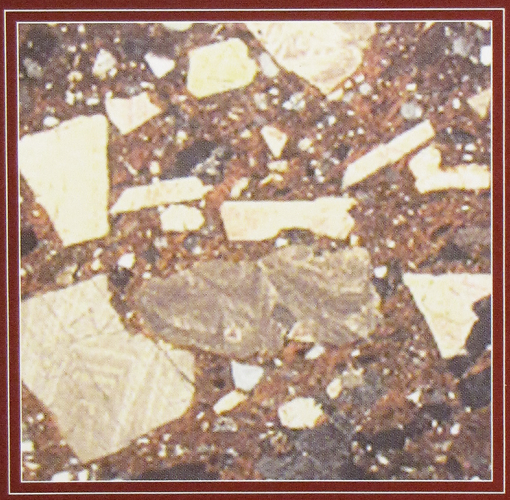
Thin-Section Petrography of Ceramic Materials

INSTAP ARCHAEOLOGICAL EXCAVATION MANUAL 2

Sarah E. Peterson



with contributions by
Philip P. Betancourt

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Introduction

Thin-section petrography is a useful methodology for the study and classification of clay fabrics. Thin sections can be used to examine a wide variety of materials, including rocks, minerals, slags, concrete, mudbrick, and plaster, as well as fired clays. The method can provide evidence for a number of important aspects of ceramic studies including the determination of provenance and the reconstruction of technology.

A thin section is created by sawing off a small fragment of the material to be studied, attaching the resulting flat surface to a glass microscope slide, and grinding the exposed surface of the fragment down to a standard thickness (ca. 25–30 micrometers) (Fig. 1). The thin section is then examined using a polarizing microscope (Fig. 2). At the standard thickness, the mineral inclusions present in the fabric become transparent and can be identified based on characteristic optical properties (Bambauer, Taborszky, and Trochim 1979; Deer, Howie, and Zussman 1996; Nesse 2004). The fabric can then be classified through the identification and examination of its plastic and aplastic components, microstructure, and texture.

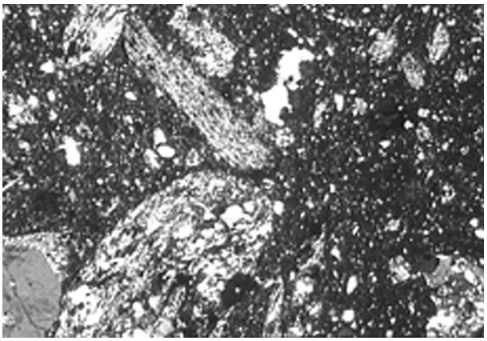

Figure 1. *Photomicrograph of a thin section of a coarse vessel from Mochlos in cross-polarized light showing large, weathered phyllite inclusions (after Day and Relaki 2003, pl. 1A, sample no. 95/50). Horizontal dimension = 4 mm.*



Figure 2. *Eleni Nodarou using a petrographic microscope to study thin sections of pottery at the Institute for Aegean Prehistory Study Center for East Crete, Pacheia Ammos, Crete, Greece. Photo by Chronis Papanikolopoulos.*