



## Review

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INSCRIBED IN CLAY:  
PROVENANCE STUDY OF THE AMARNA LETTERS  
AND OTHER ANCIENT NEAR EASTERN TEXTS

Yuval Goren, Israel Finkelstein, and Nadav Na'aman  
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Reviewed by Mary F. Ownby  
Department of Archaeology, University of Cambridge

### ABSTRACT

*This review discusses the important results of the petrographic analysis of the Amarna tablets presented by Yuval Goren, Israel Finkelstein, and Nadav Na'aman. Particular attention is given to summarizing some of their key findings, which highlight the potential for scientific analysis of clay objects to provide relevant and otherwise unattainable information on the specifics of human history. This book is a key resource for any individual studying the political relationships between Egypt and the Near East, the historical events of the Late Bronze Age, or the geopolitical layout of the empires and city-states in this region, and offers a promising new approach to ceramic petrography in general.*

With *Inscribed in Clay: Provenance Study of the Amarna Letters and other Ancient Near Eastern Texts*, Y. Goren, I. Finkelstein, and N. Na'aman present a compelling new combination of archaeological science, history, and textual analysis. At the core of their work is an innovative application of ceramic petrography and chemical analysis to the corpus of cuneiform tablets known as the Amarna letters. Numbering over 300, these tablets comprise the known correspondence of kings and Egyptian vassals in the Near East with pharaohs Amenhotep III and Amenhotep IV/Akhenaten, and were found at the Egyptian site of Amarna (Akhenaten's capital). While the letters have been scrutinized by historians and philologists since their discovery at Akhenaten's abandoned capital of Akhetaten (modern Amarna), this represents the first scientific approach to their study, and Goren et al. succeed in clarifying some complexities of the political situation in the Near East during the Late Bronze Age (LBA) from 1450 to 1150 BCE.<sup>1</sup>

The uniqueness of this work lies in its application of thin-section petrography (typically utilized for establishing the provenance of ceramics) to clay tablets, which permits the identification of the clays and inclusions used to produce them. Utilizing geological maps, areas with outcrops that could supply these materials can be located and a provenance for a tablet proposed. The textual information on the tablets can be employed to suggest areas or sites where the tablet may have originated, while the

petrographically determined provenance can assist in contextualizing the written information. As *Inscribed in Clay* demonstrates, both types of analysis shed significant light on the geopolitical situation of the time.

The 384 pages of the book are divided into sixteen chapters, an appendix, a supplement, references, and an index. The book begins with an introduction to the background of the study (Chapter 1) and a discussion of the methodology (Chapter 2). The results of the analysis of the tablets are organized as follows: messages sent from empires in the Near East including Egypt, Hatti, Babylonia, Mitanni, Arzawa, and Alashiya (Chapter 3), literary texts and student exercises (Chapter 4), and analysis by geographic region and provenance (Chapters 5 through 15).

Within the chapters, the letters are divided into sections based on current opinion about the location from which they were sent. Each section is introduced by a brief summary of previous historical and linguistic analyses of the letters. Next, the resources employed in interpreting the petrographic results are discussed, including the relevant geological information and ceramic comparanda for that area. For the individual letters, details provided include author and recipient, petrographic description, geological interpretation, references to any available previous petrographic studies of similar material, and a conclusion/discussion based on the above data and any relevant textual information. Conclusions are also provided for each section,

summarizing the new interpretations possible from the petrographic data and any results from chemical analyses. The final chapter discusses the contribution of this study to understanding the technology of cuneiform tablets and the geopolitical layout of the Near East.

One of the most useful parts of this book is the supplement, which consists of a gazetteer of Late Bronze II sites in Canaan, listing location, site grid reference (Israeli system), size (based on five categories), bibliography, and description for each site. In combination with the exhaustive references, this is an excellent source of information on the archaeology of the Near East. The nine figures in the text include several informative maps of the areas discussed. Thirteen plates illustrate the thin sections and provide an excellent resource for comparative petrography, while the appendix gives the results of the chemical analyses. Finally, the index of petrographic fabrics is useful for anyone studying pottery from this region.

A challenge for the study of the Amarna tablets was acquiring sufficient material for thin section analysis, as most of the tablets are complete and covered in writing. However, the authors developed a unique sampling method that allowed them to examine such delicate materials. Although this methodology produced small, thin sections, it still provided enough of a sample to identify clay type, mineralogy, and any diagnostic features. This outcome should encourage other ceramic petrographers to utilize small samples when the objects of interest are fragile or unique. Additionally, the small "crumbs" that were loosened from the tablet during sampling were taken for inductively coupled plasma spectroscopy (ICP). The combination of petrographic and chemical data successfully identified those tablets produced of materials deriving from a common source. The success of this methodology should confirm that both types of data are invaluable in provenance studies. The authors also consider the process for establishing possible locations of manufacture through the use of geological maps and comparative ceramic material, though they acknowledge that ceramic vessels can be made of a wide range of fabrics (defined as clay plus inclusions and the potter's processing and firing), in contrast to the specially selected, light-colored, low-fired fabrics of the tablets.

The petrographic analysis provides fascinating insight into regional differences in tablet production. In Egypt, tablets were manufactured predominantly of Esna marl, a material not typically utilized to produce pottery,<sup>2</sup> chosen perhaps for a lightness of color that facilitated the reading of cuneiform script. Elsewhere, however, the materials employed for making tablets were similar to those used for pottery. The results of the analysis of the tablets sent from Hatti confirms their origin from an area in Anatolia, probably near the site of Boğazköy, while the Babylonian texts found at Amarna were manufactured from Euphrates sediments. Tablets from Mitanni were produced from two clay types that both derived from the Khabur River basin in northern Syria, and may suggest the important LBA site

of Tell Fakhariyeh is to be associated with the Mitannian capital of Waššukanni. The analysis of tablets sent from Alashiya<sup>3</sup> indicates they were made on Cyprus at either Kalavassos Ayios Dhimitrios or Alassa Paliotaverna/Pano Mandilaris. Both sites are located on the southern side of Cyprus, which suggests this region was the political nexus of Alashiya during the fourteenth and thirteenth centuries BCE. Thus, through petrographic analysis, Goren et al. confirm the locations of several large and well-known empires of the Late Bronze Age.

Chapters 4–6 discuss the analysis of a collection of scholarly texts, letters from north Syrian kingdoms, and tablets from Syrian kingdoms in the middle Orontes. Petrographic and chemical results from the thirty-two scholarly texts indicates that although some are stories of Near Eastern origin, most were written in Egypt, probably to train scribes in cuneiform. The identification of three scholarly texts that could be petrographically assigned to Mesopotamia proves original copies of the tales were sent to Egypt. Tablets sent from Ugarit were virtually identical to LBA ceramics from Ras Shamra, while the tablets sent by Akizzi of Qatna are petrographically in accord with the geological surroundings of Tell el-Mishrife, the site archaeologically identified as Qatna. A letter sent from Qidshu by Etakkama contains inclusions that are compatible with the outcrops near the site of Tell Nebi Mend, supporting its designation as Qidshu. Goren et al. thus also confirm the locations of several major sites crucial to international relations of the Late Bronze Age.

The analysis of tablets sent from the Kingdom of Amurru (Chapter 7) suggests that this kingdom expanded its territory first by capturing the city of Ardata (Tell Arde), east of Tripoli, then the city of Irqata (Tell 'Arqa). The tablets of Abdi-Ashirta came predominantly from Ardata, while his successor Aziru sent letters from Irqata. However, only a few letters from the latter king were produced near Sumur (Tell Kazel), while none were manufactured at Tunip (Tell 'Asharneh), showing he did not spend time at these other cities in Amurru. Such a detailed reconstruction of this early imperial expansion illustrates the impressive ability of petrographic methods to clarify history.

A discussion of letters deriving from city-states in the Lebanese Beqa' (the river valley between Mount Lebanon and Mount Anti-Lebanon) and littoral (coastal region) is offered in Chapters 8 and 9. The tablets from the Beqa' proved to contain materials that are widely distributed but still in keeping with the geology of the region. The homogeneity of the tablets may suggest they were sent from a single site, possibly the Egyptian administrative center of Kumidi (Kamid el-Loz), rather than from the headquarters of each individual ruler. This would indicate the importance of these centers in maintaining contacts between Egypt and the city-states of the Near East. Petrographic results from the large corpus of letters sent from Byblos confirm their similarity, while the tablets from Beirut are also demonstrated to be homogenous. Analysis of two letters from a ruler named Zimreddi show him to have resided at Sidon. Similarly, the letter from [Ba'lu]-danu has petrographic features that the

authors link to tablets sent from Tyre, thus placing this individual as a king of Tyre. Once again, petrographic analysis in conjunction with textual and historical information allows a more complete understanding of the geopolitical layout of this region in the Late Bronze Age.

The Amarna tablets sent from inland Syria are discussed in Chapter 10. The similarity in materials of a letter sent from a king named Hiziru and another from the city of Zuhra suggests Hiziru ruled from Zuhra, which mineralogical characteristics in turn place on the Gilead plateau. The petrographic results also support the hypothesis put forth by Na'aman that Biryawaza ruled from the city of Damascus. However, the results of six letters made of different materials sent by Biryawaza suggest he travelled to a city on the edge of the Bashan plateau from which the tablets were sent to Egypt. Details of this expedition are found in Amarna letter EA 197, which Goren et al. have remarkably been able to confirm. While these results corroborate historical information, they are also important because no previous petrographic work has been conducted on materials directly from this region and the data offer an initial description of the available raw ceramic materials.

Chapter 12 concerns those tablets sent from the Galilee, the coastal plain of Acco, and the northern valleys of Israel. The authors' analysis of a letter sent from the city of Achshaph firmly establishes the site of Tell Keisan as this city. Intriguingly, a letter sent from the ruler of Shamhuna is shown to actually have been made at the Egyptian administrative center of Beth-Shean rather than from the ruler's capital. The same scenario is proposed for tablets sent by Surata and his son Shatatna, rulers of Acco. A similar father-son succession, Bayadi and Baduzana of the city-state of Anaharath, is attested in the Amarna letters, and based on the petrographic results, their capital was likely located at the site of Tel Rekish in the eastern Lower Galilee. The petrographic approach of Goren et al. thus further assists in connecting rulers to areas governed and confirming lines of succession.

The authors' analysis of several tablets in which the capital of the ruler is unknown yields quite important results. The ruler Ba'lu-UR.SAG appears to have had his capital at the site of Rehob (Tel Rehov, Tell es-Sarem). Ba'lu-mehir's capital was likely the site of Tel Yokneam (Tell Qeimun), from which his successor, Wiktasu, also corresponded with the pharaoh. The ruler Tagi is believed to have had his capital at Ginti-Kirmil, which Goren et al. identify with the site of Jatt. Finally, two letters from Mut-Ba'lu were petrographically dissimilar, indicating that one was sent from his capital at Pehel (Pihilu, Pella) and the other from Beth-shean. The identification of the capitals of these city-states significantly revises the geopolitical map of the area.

Chapter 13 discusses the tablets from the region of the central hill country, while Chapter 14 concerns letters from the Shephela and southern coastal plain. The tablets sent from Lab'ayu to the king of Egypt were produced of materials available in the vicinity of the site of Shechem. The analysis of letters sent by Abdi-Heba indicates these were probably sent from

Jerusalem. Meanwhile, analysis of the correspondence from Milkilu, Yapahu, and Ba'lu-danu confirms that most of these kings' letters derived from the city of Gezer (with the exception of four sent by Yapahu from the Egyptian center at Gaza). Letters sent by Shuwardatu, ruler of Gath, confirm his capital's location at Tel Safit (Tell es-Safi) rather than Tel Haror; furthermore, their similarity to tablets sent by Abdi-Ashtarti suggest the latter was Shuwardatu's successor. The city of Lachish (Tell ed-Duweir) appears to have been ruled by Shipti-Ba'lu, his tablets being composed of materials local to this site. The letter by Zimreddi was sent from the Egyptian center at Gaza, and thus does not assist in confirming if he was also a ruler of Lachish. The petrographic analysis of tablets sent by Yahzib-Adda suggests his capital was at Beth-shemesh, although doubt still remains. The site of Ashdod appears to be the location from which the rulers Yahtiru and Si-x-x-ni sent letters to Egypt. Along the Israeli coast, the site of Ashkelon is likely to have been the home of rulers Yidia and Shubandu. The analysis by Goren et al. of tablets dispatched by Pu-Ba'lu, ruler of Yurza, suggests his capital should be associated with the site of Tell Jemmeh.

Chapter 15 considers letters sent from unidentified cities in Canaan. Most of these letters appear to derive from areas in Israel or the Egyptian administrative center at Gaza. Others, while petrographically distinct, prove more difficult to assign to a specific location. However, the results presented by Goren et al. indicate the significant role Gaza played in dispatching correspondence from rulers in Canaan to the king of Egypt.

The final chapter presents the overall conclusions of the study. Foremost is the confirmation of petrography as a key method for the investigation of cuneiform tablets. However, the authors caution, interpretation of results must proceed carefully: textual analysis can greatly assist in locating the site of production, and utilizing both petrographic and textual information provides the most reliable conclusions.

While provenance is an important part of Goren et al.'s work, their analysis also provides information on the technological aspects of tablet production. The characteristics of the inclusions in the tablets indicates the use of refined clays for the manufacture of Mitannian and Babylonian tablets, while Canaanite tablets appear to have been manufactured of materials similar to those used for making pottery. A similar division is noted by Goren et al. for the firing temperature of the tablets, with Canaanite and Egyptian tablets unfired or briefly fired and those from the Near Eastern empires usually fired at 700–800°C. Firing the tablets would have prevented any alterations to the text and ensured the document's long-term survival in an archive. These technological differences are most likely related to the long tradition of cuneiform tablet manufacture by the empires in place at a time when Canaanite city-states were only just beginning to produce tablets.

The authors also discuss the impact of their results on the understanding of Late Bronze Age city-states in Canaan. While some disputes were resolved in the analysis, others were not, and

some additional questions were formulated. Goren et al. put the number of city-states in western Canaan at twenty, but confirmation is difficult due to the pervasive lack of archaeological evidence from the LB II period. The results do, however, highlight the importance of the Egyptian administrative centers (particularly Gaza) in the Levant for dispatching correspondence to Egypt. Rulers traveled to such centers to send messages to the king of Egypt, written either by their own scribes or Egyptian ones. This system appears to have been integral to Egypt's efforts to maintain control over areas of Canaan.

The results of the analyses by Goren et al. have been summarized herein to illustrate their importance in not only confirming and revising previously held historical opinions, but also answering even simpler questions such as where an individual letter was sent (e.g., letter EA 50 sent from the daughter of [?] to the queen of Egypt, now established to have been sent from Byblos). Particularly for areas of northern Syria and Israel, the geopolitical map of city-states has been refined, allowing more detailed questions to be posed regarding economic and political interactions. Additionally, the historical information within the letters can more clearly be understood and thus utilized to develop a richer narrative of the regional events of the time. The unique interplay between scientific data, textual analysis, archaeological information, and historic background forms a model for future studies and confirms that all four lines of evidence—while independent—are complementary, and together provide a coherent explanation of events. *Inscribed in Clay* is invaluable not only to

any individual studying the political history of the Eastern Mediterranean in the Late Bronze Age, but to archaeological scientists working with clay artifacts from the region. No discussion of the geopolitical events of this period should be made without reference to the important conclusions presented by Goren, Finkelstein, and Na'aman.

#### NOTES

1. A preliminary publication of the work was published as Yuval Goren, Israel Finkelstein, and Nadav Na'aman, "Petrographic Investigation of the Amarna Tablets," *Near Eastern Archaeology* 65 (2003): 196–205.
2. Further study of the Egyptian marl clay pottery, particularly through petrographic analysis, may reveal whether Esna marls were utilized for the manufacture of some ceramics (see Nordström and Bourriau for a discussion of Egyptian clay sources); Hans-Åke Nordström and Janine Bourriau, "Fascicle 2, Ceramic Technology: Clays and Fabrics," in Dorothea Arnold and Janine Bourriau (eds.), *An Introduction to Ancient Egyptian Pottery* (Deutsches Archäologisches Institut Abteilung Kairo 17, Mainz am Rhein: Verlag Philipp von Zabern, 1993): 145–190.
3. Also published as Yuval Goren, Shlomo Bunimovitz, Israel Finkelstein, and Nadav Na'aman, "The Location of Alashiya: New Evidence from Petrographic Investigation of Alashiyan Tablets from el-Amarna and Ugarit," *American Journal of Archaeology* 107 (2003): 233–255.