

DATA PAPER

Chemical Composition by Neutron Activation Analysis (INAA) of Neo-Assyrian Palace Ware from Iraq, Syria and Israel

Alice M W Hunt¹ and Johannes H Sterba¹

¹ UCL Institute of Archaeology, 31-34 Gordon Square, London WC1H 0PY, United Kingdom

² Atominstytut, Technische Universität Wien, Austria

Neo-Assyrian Palace Ware is an 8th-7th century B.C.E. fine-ware which originated in Northern Mesopotamia and spread throughout the greater Levant. The mechanism by which Palace Ware moved across the Neo-Assyrian imperial landscape (trade or local imitation/emulation) is of great archaeological interest. This dataset provides chemical compositional data, generated using instrumental neutron activation analysis (INAA), for Palace Ware vessels from Nimrud and Nineveh, in the Assyrian imperial core (Iraq), Dūr-Katlimmu, in one of the annexed provinces (Syria), and Tell Jemmeh, located outside the Neo-Assyrian provincial system (Israel).

Keywords: INAA, Palace Ware, Neo-Assyrian ceramics, Mesopotamia, pottery

Funding statement

The generation of this dataset was made possible by grants from the UCL Graduate School, Smithsonian Institution Fellowship Program and the United States Department of State Bureau of Education and Cultural Affairs to support the doctoral research of Alice Hunt.

Context

Neo-Assyrian Palace Ware was first identified as a distinct cultural phenomenon in the 1850s¹ but was not referred to as 'Palace Ware' until the 1950s when Rawson applied the term to a corpus of vessels excavated by Mallowan from the North-West Palace at Nimrud.² Palace Ware has been associated with Neo-Assyrian imperial power, administration and prestige since the early 20th century³ because it is excavated primarily from royal and administrative contexts and appears to be a skeuomorph of metal forms also recovered from these contexts.^{4,5}

Palace Ware is distinguished within the greater Neo-Assyrian ceramic corpus by its extremely fine paste and delicate, thin walls.⁶ Palace Ware is a relatively short-lived phenomenon: first appearing in the late 9th century B.C.E. and discontinued in the late 7th century B.C.E., after the fall of Assyria to Babylon. Despite its short duration, Palace Ware is distributed across and beyond the boundaries of the Neo-Assyrian imperial landscape. The short duration of Palace Ware consumption combined with its association with Neo-Assyrian power and administration has enabled archaeologists, rightly or wrongly, to use Palace Ware as an 'index artefact' of Assyrian imperial contact and/or occupation.⁷

Of interest to archaeologists and Assyriologists is the provenance of Palace Ware because of its important

implications for our understanding of social, political and administrative organisation of the Neo-Assyrian empire and the relationship between the core and annexed provinces. This dataset provides chemical compositional data for Palace Ware vessels from Nimrud, Nineveh, Dūr-Katlimmu and Tell Jemmeh which indicates that Palace Ware was manufactured locally.

Material analysed in this study is part of a larger corpus of Palace Ware vessels studied as part of the doctoral research of Alice Hunt. The sample population from the Neo-Assyrian imperial core includes material from two sites: Nimrud and Nineveh. Palace Ware samples from Nimrud are courtesy of the Trustees of the British Museum and come from Mallowan's excavation of the North-West Palace and Nabu Temple. Samples from Nimrud are designated by lab numbers beginning with 'N'. Palace Ware samples from Nineveh were provided by the UC Berkeley excavation of Kouyunjik and come from 8th-7th century B.C.E. strata adjacent to an unpublished ceramic workshop. Samples from Nineveh are designated by lab numbers beginning with 'NV'.

The sample population from the annexed provinces comes from Dūr-Katlimmu. Palace Ware from Dūr-Katlimmu is courtesy of the Tall Schech Hamad Projekt and comes from the Red House. Samples from Dūr-Katlimmu are designated by lab numbers beginning with 'SH'.

The sample population from outside the Neo-Assyrian provincial system comes from Tell Jemneh. Palace Ware samples from Tell Jemneh are courtesy of the Petrie Palestinian Collection at UCL Institute of Archaeology and van Beek's excavation of the site housed in the Smithsonian Institution National Museum of Natural History. Samples from Tell Jemneh from the Petrie collection are designated with lab numbers beginning with 'J' and those from the Smithsonian collection are designated with lab numbers beginning with 'JS'.

Spatial Coverage

- NIMRUD (ancient Kalhu), Mosul, Iraq: 36° 5' 57" N / 43° 19' 39" E
- NINEVEH, Mosul, Iraq: 36° 21' 34" N / 43° 09' 10" E
- DÜR-KATLIMMU, Lower Khabur, Syria: 35° 38' 36" N / 40° 44' 25" E
- TELL JEMMEH, Negev, Israel: 31° 32' 15" N / 34° 26' 41" E

Temporal Coverage

ca. 850 BCE - ca. 600 BCE

Methods

Steps

After a preliminary microscopic investigation to check the samples for foreign matter attached to the surface, the surface of the samples was scraped clean using the sharp edge of a pure silicon blade. For INAA, established procedures at the Atominstitut⁸ were followed: cleaned samples were crushed in an agate mortar and then dried at 80°C overnight. For each sample, approximately 100 mg were weighed into SuprasilTM quartz glass vials, sealed and then irradiated for approximately 40 h together with internationally certified standard reference materials in the central irradiation tube of the TRIGA Mk II research reactor of the Atominstitut at a neutron flux density of $1 \times 10^{13} \text{cm}^{-2} \text{s}^{-1}$. After irradiation, the vials' surface was decontaminated and they were packed into PE vials fitting the sample changer of the γ -spectroscopy system at the Atominstitut, consisting of a 151 cm³ HPGe-detector (1.8 keV resolution at the 1332 keV ⁶⁰Co peak; 50.1% relative efficiency), connected to a PC-based multichannel analyser with a preloaded filter and a Loss-Free Counting system. All samples were measured twice, once after a decay time of 5 days for 1800 s to obtain the activities of the short- and medium-lived radionuclides ⁷⁶As, ⁴²K, ¹⁴⁰La, ²⁴Na, ²³⁹Np (U), ¹⁵³Sm and ¹⁸⁷W. The second measurement after an additional cooling time of 3 weeks at a measurement time of 10000 s was performed to detect the activities of the long-lived radionuclides ¹³¹Ba, ¹⁴¹Ce, ⁵⁸Co (Ni), ⁶⁰Co, ⁵¹Cr, ¹³⁴Cs, ¹⁵²Eu, ⁵⁹Fe, ¹⁸¹Hf, ¹⁷⁷Lu, ¹⁴⁷Nd, ²³³Pa (Th), ⁸⁶Rb, ¹²⁴Sb, ⁴⁶Sc, ⁸⁵Sr ¹⁸²Ta, ¹⁶⁰Tb, ¹⁶⁹Yb, ⁶⁵Zn and ⁹⁵Zr.

Sampling Strategy

Samples for INAA analysis were chosen based on their conformity to typological and definitional criteria for Palace Ware detailed by Hunt⁶ and the absence of macroscopic surface corrosion and/or accretion.

Quality Control

For the quantitative analysis, 4 internationally certified standard reference materials were irradiated and measured together with the samples. Specifically, the CANMET reference soil SO1, NIST SRM 1633b Coal Fly Ash, BCR No. 142 light sandy soil and the MC rhyolithe GBW 07113 were used. Furthermore, each measurement run also included a sample of the Bonn standard⁹ as an in-house reference material.

Constraints

N/A

Dataset Description

Object Name

Palace Ware INAA

Data Type

Primary data

Format Names and Versions

.csv, .pdf

Creation Dates

The dataset was created between March 2007 and March 2011.

Dataset Creators

- Alice Hunt, Principal Investigator
- Johannes H. Sterba, Radiation Physicist

Repository Location

Archaeological Data Service, collection 1316:
DOI: <http://dx.doi.org/10.5284/1018292>

Publication Date

16/04/2013

Language

English

License

CC-BY

Reuse Potential

This dataset comprises chemical compositional data for Neo-Assyrian Palace Ware vessels and, therefore, is a valuable reference for archaeologists and archaeological scientists conducting provenance studies of ceramics from the Neo-Assyrian period and Northern Mesopotamia. Given the difficulty of sampling material from Nimrud and Nineveh this dataset provides a unique resource for provenance studies of Assyrian ceramics.

Acknowledgements

This dataset was created as part of the doctoral research of Alice Hunt and she would like to thank the following for providing her access to material for INAA analysis: The Trustees of the British Museum and John Curtis; David Stronach, Eleanor Wilkinson and Stephen Lumsden (UCL Berkeley Excavation); Hartmut Kühne and Janoscha Kreppner (Tall Schech Hamad Projekt); Rachael Sparks (Petrie Palestinian Collection; and Melinda Zeder (Smithsonian Institution, National Museum of Natural History).

References

1. **Layard, A H** 1849 *Nineveh and its remains: with an account of a visit to the Chaldaean Christians of Kurdistan, and the Yezidis, or devil-worshippers, and an enquiry into the manners and arts of the ancient Assyrians*. London: John Murray.
2. **Rawson, P S** 1954 Palace ware from Nimrud: technical observations. *Iraq* 16: 168–172.
3. **Courtois, L C** and **Doray, A M** 1983 Technologie et céramiques Levantines au temps de la domination Assyrienne Comptes Rendus du 108e Congrès National des Sociétés Savantes, Grenoble: Ministère de L'éducation Nationale Comité des travaux historiques et scientifiques. Paris: CTHS;
4. **Oates, J** 1959 Late Assyrian pottery from Fort Shalmaneser (8th-7th century). *Iraq* 21: 130–146.
5. **Petrie, W M F** 1928 *Gerar*. London: British School of Archaeology in Egypt.
6. **Hunt, A M W** 2012 And I Called Them Assyrians: An Archaeological and Archaeometric Analysis of Neo-Assyrian Palace Ware. London: University College London, (Unpublished PhD thesis).
7. **Parker, B** 2001 *The Mechanics of Empire: The Northern Frontier of Assyria as a Case Study in Imperial Dynamics*. Helsinki: Vammalan Kirjapaino Oy.
8. **Steinhauser, G, Sterba, J H, Bichler, M** and **Huber, H** 2006 Neutron Activation Analysis of Mediterranean volcanic rocks - An analytical database for archaeological stratigraphy. *Applied Geochemistry* 21: 1362–1375, DOI: <http://dx.doi.org/10.1016/j.apgeochem.2006.03.012>
9. **Mommsen, H** and **Sjöberg, B L** 2007 The Importance of the 'Best Relative Fit Factor' when evaluating elemental concentration data of pottery demonstrated with Mycenaean sherds from Sinda, Cyprus. *Archaeometry* 49: 359–371, DOI: <http://dx.doi.org/10.1111/j.1475-4754.2007.00306.x>

How to cite this article: Hunt, A.M.W. and Sterba, J H 2013 Chemical Composition by Neutron Activation Analysis (INAA) of Neo-Assyrian Palace Ware from Iraq, Syria and Israel. *Journal of Open Archaeology Data* 2:e10, DOI: <http://dx.doi.org/10.5334/joad.aa>

Published: 21 May 2013

Copyright: © 2013 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 3.0 Unported License (CC-BY 3.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/3.0/>.

