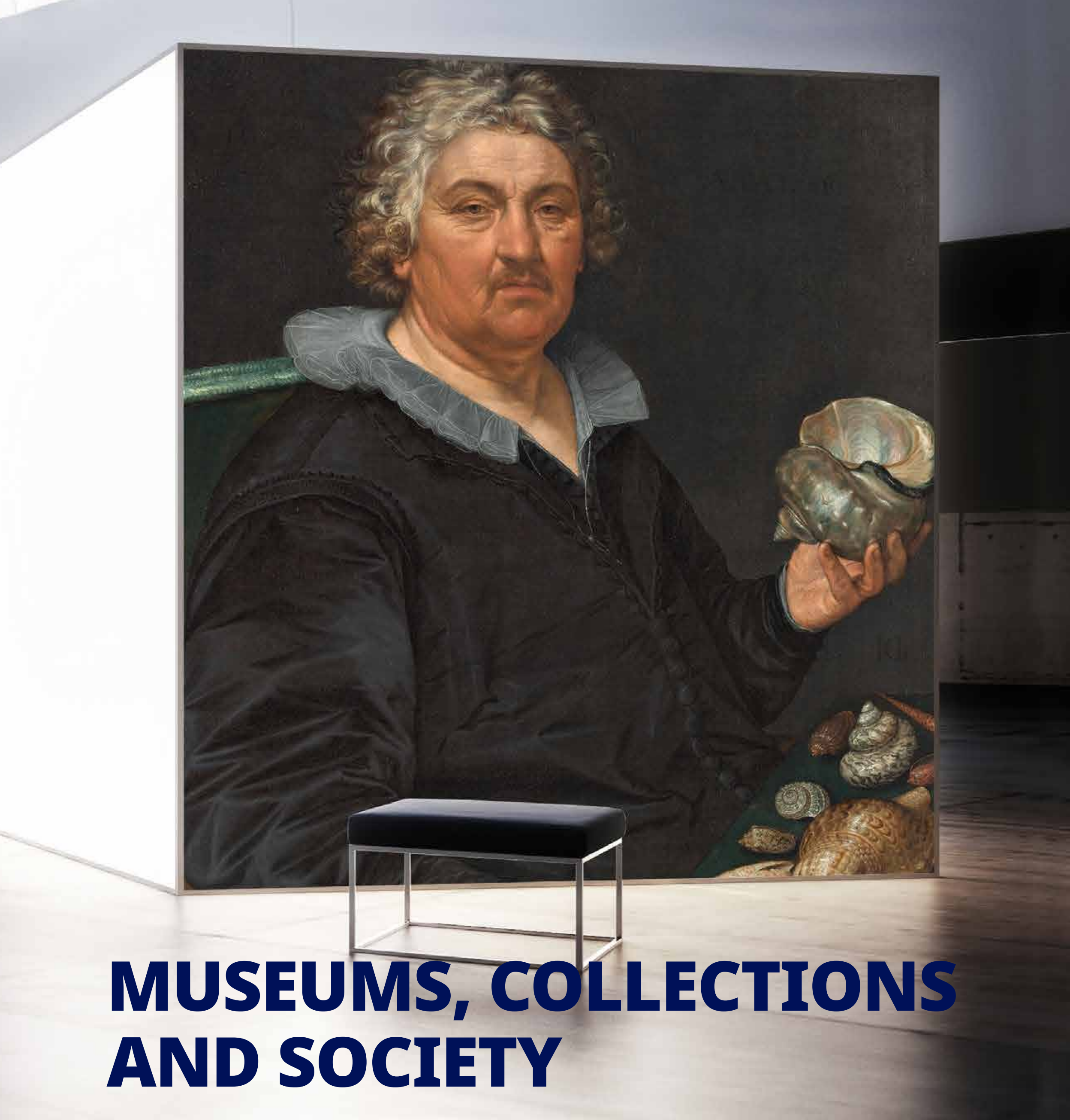
The world on a string

Aerde, M. van; Langbroek, M.; O'Farrell, H.; Keurs, P. ter



MUSEUMS, COLLECTIONS AND SOCIETY

YEARBOOK 2023

Holly O'Farrell and Pieter ter Keurs (eds)

Universiteit Leiden
The Netherlands

MUSEUMS, COLLECTIONS AND SOCIETY

YEARBOOK 2023

Holly O'Farrell and Pieter ter Keurs (eds)

Research Group
Museums, Collections and Society (MCS),
Leiden University

Design, lay-out and print:
Sidestone Press, Leiden
www.sidestone.com

Photograph cover: Hendrick Goltzius, *Jan Govertsz. van der Aar,* ca. 1603. Oil on canvas, 107 × 82 cm. Museum Boijmans-van Beuningen, Rotterdam.

Universiteit Leiden
The Netherlands

Contents

The World on a String

Marike van Aerde & Mette Langbroek

This interdisciplinary MCS research project is a collaboration between:
Dr. Marike van Aerde & Mette Langbroek & Dr. Dennis Braekmans
Faculty of Archaeology, Leiden University
Dr. Lara Weiss & Dr. Daniel Soliman
Rijksmuseum van Oudheden, Department of Egypt and Nubia, Leiden

Introduction and methodology

By inventorying and analysing glass beads from the Egypt collection of the Rijksmuseum van Oudheden in Leiden, this project looks at how even the smallest archaeological objects can help us chart the global networks that connected large parts of the ancient world, up until 1000 CE. Glass beads remain a notoriously understudied category of archaeological material. Side-lined and traditionally often described as 'trinkets for women', beads were sometimes deemed too insignificant to depict in official archaeological reports. Until quite recently, apart from typological studies that approached glass beads as a complementary method for site-dating, bead research remained a relatively unknown field of expertise. But when we consider the wide-ranging archaeological potential of beads, they are actually highly suitable for a variety of research purposes: beads are durable, portable, ubiquitous, and highly variable objects that have been found in archaeological contexts spanning all across the globe. As such, they can be important datasets for an equally wide variety of studies of past cultures.

Interestingly, one of the reasons why beads have at times been neglected is exactly because they are so ubiquitous: in past scholarship, archaeologists have tended to pay more prominent attention to material culture that was considered elite or belonged to high-status contexts. Only since recently, research of commonplace beads, made and bought and used by everyday people in everyday contexts, is expanding on multiple levels.[1] Already in early Antiquity, beads were exchanged over remarkably long distances, and also in remarkable quantities.[2] Beads were globetrotters, and they often crossed far greater distances than most people ever did in ancient times. Today, the scientific study of glass beads can therefore enable us to reconstruct the variability of long-distance networks, which were already in place centuries before (and also after) the Roman networks that often still remain the primary focus of many studies.

Egypt, especially, already functioned as both hub and nodal point in the network of bead exchange and production, long before the first millennium CE. Some of the oldest evidence of glass bead manufacture in Egypt dates to the first two millennia BCE.[3] Notably, in Egyptian contexts (everyday as well as elite contexts), beads and beaded jewellery were worn by men and women alike.[4] The same is true for beads and jewellery from the ancient Indian Subcontinent: the definition of beads as women's objects does not hold when we widen the scope and study these tiny globetrotters as data points within a transregional ancient web of connections. Egypt offers a remarkable focus for this, as we can and should approach it as long-term transit hub of beads from all across the world as well as home to large-scale and equally long-term bead production centres.[5] Bead datasets from Egyptian sites provide information about manufacture processes and ranges of transport, as well as the quantity of bead import from as far away as southern India and Sri Lanka.

The Rijksmuseum van Oudheden in Leiden holds an extensive and diverse collection of beads from Egypt, which provided us with an excellent case study to assess the variety of different types of beads that came from and/or were transported via Egypt. A close study of these different properties and provenances, in turn, helps

---

1 For example, Carine Pion and Benjamin Gratuze, "Indo-Pacific Glass Beads from the Indian Subcontinent in Early Merovingian Graves (5th-6th Century AD)," Archaeological Research in Asia 6 (2016): 51-64; M.B. Langbroek et al., "Bead Carnival: Chemical Analyses of Merovingian Beads from the Cemetery of Lent-Lentseveld," *Zeitschrift für Archäologie des Mittelalters* 52 (2023); M. van Aerde and S.A. Botan, "Trade Dynamics in East Africa: The Continuation of Ancient Port Settlements in the First Millennium AD," *Talanta: Proceedings of the Dutch Archaeological and Historical Society* 54 (2023): 97-116.

2 Peter Jr. Frances, *Asia's Maritime Bead Trade* (Honolulu: University of Hawaii Press, 2002).

3 Schweizer, F. 2002 "Glas des 2. Jts. v. Chr. im Ostmittelmeerraum: Billige Imitation oder exklusiver Werkstoff?" In R. Aslan, S. Blum, G. Kastl, F. Schweizer and D. Thumm (eds), Mauerschau. Festschrift für Manfred Korfmann: 517-540. Remshalden-Grunbach: Greiner.

4 M. Cifarelli, "Adornment, Identity, and Authenticity: Ancient Jewelry in and Out of Context," *American Journal of Archaeology Online Museum Review* 114, January 2010, pp. 1-9.

5 Cf. M. Spaer, "Gold-Glass Beads: A Review of the Evidence," *Beads, Journal of the Society of Bead Researchers* 5 (1993): 9-25; C. Pion, *Les perles mérovingiennes: Typo-Chronologie, Fabrication et Fonctions* (PhD diss., University of Brussels, 2014); Joanna Then-Obluska and Laure Dussubieux, "Glass Bead Trade in the Early Roman and Mamluk Quseir Ports – A View from the Oriental Institute Museum Assemblage," *Archaeological Research in Asia* 6 (2016): 81-103.

us to reconstruct the flow of the networks through which these objects moved, on a larger scale. This necessitates the interdisciplinary and collaborative approach that we pursued for this project.

Marike van Aerde's research project *Routes of Exchange, Roots of Connectivity* attempts to map and interpret the ancient trade networks that connected East Africa and the Indian Subcontinent, on the basis of archaeological materials including (but not limited to) pottery, organic remains of food ware, and glass beads from transregional sites. The Red Sea ports of Egypt were main nodes in these networks, and southern India was a main producer and exporter of glass beads from as early as 300 BCE.[6] Mette Langbroek's doctoral research specialises in the documentation and study of individual bead types from Merovingian graves, from which a remarkable variety of beads have be identified with origins ranging from Mesopotamian to the eastern end of the Indian Ocean region.[7] Both perspectives offer a comparative basis for the Egyptian bead dataset from the Rijksmuseum van Oudheden collection, as documented and curated by Lara Weiss and Daniel Soliman. Dennis Braekmans contributes the technical expertise, by conducting the XRF analysis of the bead samples. The combination of specialties and methodologies brought along by this group of researchers inherently moves the discussion and interpretation towards a wider scope than a basic excavation or collection report would be able to achieve.

In this short paper, we describe a notable case study from the dataset that highlights the various layers of interest of the beads themselves and of the consideration of Egypt's role in their creation and/or distribution. Our methodology, applied to every case study within the dataset, consists of several consecutive steps. After taking stock of the glass bead collection from the Egypt department of the Rijksmuseum van Oudheden, a careful selection was made of beads to be used for analyses, narrowed down to approximately 100 individual beads. The relevant beads were subsequently analyzed by means of digital microscopy to determine material properties, specific recognizable manufacture techniques and, where possible, visible criteria that might indicate or facilitate provenance determination. All beads were digitally recorded and photographed with a high resolution digital microscope camera for this purpose. Based on these initial analyses, a sub-selection was made of the beads whose provenance remained uncertain or where notable points of interest required further scrutiny. For these, analysis by portable XRF provides the next step,

---

6 Recent work on Egyptian ports and the inclusion of bead datasets: M. van Aerde and D. Zampierin, "A Lot of Pepper and a Little Garum: An Archaeological Comparison of the Roman Presence at Berenike and Arikamedu," *Journal of Ancient West & East (AWE)* 19 (2020): 145-166; Van Aerde and Botan, "Trade Dynamics".

7 M.B. Langbroek et al., "Bead Carnival"; M.B. Langbroek et al., "Early Medieval Bead-Boogie: LA-ICP-MS Analyses of Complete Glass Bead Sets from the Merovingian Cemeteries Lent-Lentseveld, Elst-'t Woud and Wijchen-Centrum," *Zeitschrift für Archäologie des Mittelalters* 53, Accepted 2024 (forthcoming).

Fig. 3.1: PhD candidate Mette Langbroek at work at the Rijksmuseum van Oudheden, Leiden.

with the device brought into the museum collection to allow for the non-invasive chemical analysis of the selected individual beads. As final step, the results of the inventory, microscopy and XRF analyses are then discussed and interpreted within the wider context of ancient exchange patterns. The research interest here is twofold: to gain closer insight into the remarkable variability and diversity found within bead datasets from Egypt, on the one hand, and gaining a better understanding of how the scientific study of small, everyday objects such as beads can make a valuable contribution to the reconstruction of transregional networks in Antiquity, on the other hand. Throughout these different stages of the research, the variety of results clearly highlights Egypt's role as nodal point for beads from the 3rd century BCE up until the Islamic period in the 1st millennium CE, and even beyond.

Case studies

The extensive collection of the Egypt & Nubia Department of the Rijksmuseum van Oudheden in Leiden contains purchases from the late nineteenth and early twentieth centuries, pertaining to objects of which specific findspots and provenance details remain unknown due to a lack of documentation. For such objects, modern scientific methods such as microscopy and XRF offer a valuable solution: innovations in technology allow us to determine the chemical composition of objects regardless of the state of documentation. Chemically, glass is composed of three main components: the former (which is melted to create the overall surface texture), the flux (which lowers the melting point) and the stabilizer (which strengthens and waterproofs the glass). The former makes up the largest percentage of the chemical mixture, and in the case of glass this is usually silicon dioxide, colloquially known as sand. Sodium carbonate and potassium carbonate are regular fluxes, while calcium carbonate generally functions as stabilizer. In addition to these core components, the use of different pigments for coloured glass also reveals specific chemical traces, which can be compared to samples from different sites and datasets. In this way, the study of the chemical components of ancient glass (beads, jugs, even broken sherds from lost artefacts) can reveal all kinds of detailed information about the object's original state and even context. Comparisons with the published and confirmed results of the chemical analyses of other samples and datasets, especially, help us trace the movements and of these objects in the past, even when their excavation or museum records are lost or incomplete.

Many of the Egyptian beads and bead strings at the Rijksmuseum van Oudheden do not have extensive documentation, dating back to their original acquisitions from the nineteenth or early twentieth centuries; most of the records list basic dimensions and identifiable material types only. For this reason, such objects from museum collections are not often included in wider or contextual archaeological studies, and as a result the diversity of the materials available in the collection remains unexplored. However, by bringing modern scientific tools and methods into the museum collections, with the collaboration between archaeologists and curators, this can change. As the following case studies make evident, in this way innovative insights can still be gained even from minimally recorded museum objects.

The official collection record for string F 1934/10.183 is very brief: 'Egypt' is listed as its findspot, identifiable materials are noted as stone, mountain crystal, carnelian, and gold glass, and it was acquired by the Rijksmuseum van Oudheden in 1934, through a legacy donation.[8] No other information is on record. But when analysing the individual beads through microscopy, a number of remarkable points emerge. Several of the beads are not made of glass, but are semiprecious gems, amethyst and carnelian. The specific cut and perforation of these beads is a recognisable technique known from the first centuries CE, during which time Egypt was a Roman province (Fig. 2 and 3). The Indian Subcontinent was the most frequent exporter of both amethyst and carnelian stone and beads during this period; the beads may have been cut from imported stones in Egypt (amethyst workshops are known in Egypt especially from the latter half of the 1st millennium CE), or they were imported

8 Inventory nr: F 1934/10.183, *Legaat 1934 (October)*.

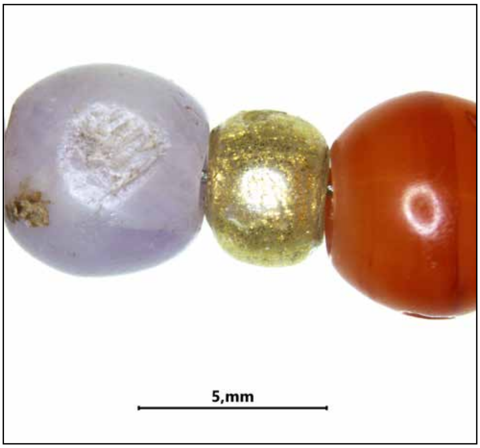


Fig. 3.2: Amethyst, gold leaf and carnelian beads. (F 1934/10.183) Langbroek & Van Aerde 2022

Fig. 3.3: (F 1934/10.183) Langbroek & Van Aerde 2022. Translucent perforated amethyst bead.

in ready-cut form. Especially carnelian was a well-known Indian import in Egypt, already long before Roman times, as early as Bronze Age sites and burials.[9]

Also notable on this string are the segmented metalfoil beads (Fig. 4). This type of gold foil bead is known from Egyptian workshops, approximately from the Ptolemaic era onwards, with manufacture centers especially in Alexandria and on Elephantine

9 C. Andrews, *Ancient Egyptian Jewelry* (New York: Abrams, 1991).

Fig 3.4: Segmented metalfoil beads (F 1934/10.183) Langbroek & Van Aerde 2022.

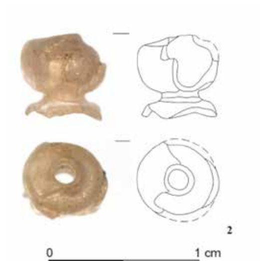


Fig. 3.5: Fragment of segmented metalfoil bead, Korea. After Szmoniewski 2020, 120, Fig. 2.

island.[10] These segmented metalfoil beads were popular across Roman and early Byzantine Europe, but they have also been found in remarkable quantities in early medieval Korea and Japan. Over 200 metalfoil beads and segmented tubes were excavated in royal tombs of Silla and Baekje in Korea, of directly comparable type as the beads from our RMO string from Egypt.[11] Chemical analyses have been conducted of these beads, with their main composition based on soda glass, low quantities of MgO and K2 O, natron as raw component, and with the gold foil between 19.9 – 22.6K (see Fig. 5).[12] As the final step in our analysis, a comparison between the chemical

---

10 Rodziewicz, M. 1984. « Alexandrie III: Les habitations romaines tardives d'Alexandrie à la lumière des fouilles polonaises à Kôm el-Dikka." Warsaw, pp. 146-159; Spaer, "Gold-Glass Beads", 10; R. Kucharczyk, "Glass from Area F on Kom el-Dikka (Alexandria). Excavations 2008," *Polish Archaeology in the Mediterranean* 20, Research 2008 (2011): 56-69, 64; B. Szmoniewski, "Roman and Early Byzantine Finds from the Japanese Archipelago – A Critical Survey," *Sprawozdania Archeologiczne* 72, no. 2 (2020): 117-141.

11 Francis, P. (1985). "A Survey of Beads in Korea." Occasional Papers of the Center for Bead Research 1, Lake Placid, NY., 14; Szmoniewski, "Roman and Early Byzantine," 120-122.

12 N.Y. Kim and G.H. Kim, "Asan myeong-amli Bakkjimeule yujeog chulto yuliguseul-ui hwahag-jeog teugseong," *Journal of Conservation Science* 28, no. 3 (2012): 205-216; fig. 7, Tables 2 and 3.

composition of the RMO string, with recorded Egyptian provenance, and this "evidence of the material origin of the beads of this specific string, it also solidifies interpretations of (truly global) bead traffic in the mid to late 1st millennium CE on a scientific basis. In a nutshell, we really do seem to have the world on a string here: semiprecious stones from India, exported to Egypt where they were cut into bead types widely known across the Mediterranean and early medieval Europe, side by side with segmented metalfoil beads that are comparable to parallels from a truly remarkable wide (geographical and cultural) range, from Merovingian graves to medieval Japan.

Another string from the RMO collection offers a similar, remarkable wide range. String F1940/12.90 consists almost entirely of tiny blue green glass beads, alongside two larger beads of faience and carnelian, and apart from its acquisition in 1940 and findspot Egypt, no details are preserved in the collection record.[13] But these tiny beads were globetrotters in the true sense of the word. These drawn, cold-cut beads, no larger than 1,5 mm in diameter, are known as the 'Indo-Pacific' bead type, and were manufactured in great quantities in South India and Sri Lanka (Fig. 6 and 7). Prominent Sri Lankan ports such as Anuradhapura and Mantai not only functioned as transit nodes for export of these beads, they were also central hubs for bead production in their areas from as early as the third century BCE.[14] Large quantities of these beads are found at sites across the Indian Ocean region and beyond; they are known from ancient, Ptolemaic and early Islamic Egypt, throughout Roman times and across early Byzantine Europe, as well as from East-African coastal sites as far south as Mozambique.[15] The production of and demand for Indo-Pacific beads continued throughout the 1st millennium CE, and we there is ample evidence of continued imports of these small-sized Indo-Pacific beads from the Indian Subcontinent, for usage in Merovingian and early Islamic context. In later times, interestingly, the size of the beads appears to increase, while their manufacture technique remains similar and also the demand for them seems to remain.[16]

---

13 Inventory nr: F1940/12.90, *Aankoop 1940*.

14 Francis, P. (1990) "Glass Beads in Asia Part Two. Indo-Pacific Beads." *Asian Perspectives*, vol. 29, no. 1, pp. 1-23; Van Aerde & Botan, "Trade Dynamics," 97-116.

15 David Peacock and Lucy Blue, "Overview: The Trade and Economy of Myos Hormos and Quseir al-Qadim," in *Myos Hormos – Quseir al-Qadim, Roman and Islamic Ports on the Red Sea, Volume 2; Finds from the Excavations 1999-2003*, eds. D. Peacock and L. Blue (Oxford: BAR Publishing, 2011), 345-352, 57-72; Then-Obluska & Dussubieux, "Glass Bead Trade," 81-103; Wood, M., L. Dussubieux & P. Robertshaw 2012. "Glass Finds from Chibuene, a 6th to 17th Century AD Port in Southern Mozambique." *South African Archaeological Bulletin* 67: 59-74

16 Pion, C. and B. Gratuze, "Indo-Pacific glass beads from the Indian subcontinent in Early Merovingian graves (5th-6th century AD)." *Archaeological Research in Asia* 6, 2016, 51-64; Marilee Wood et al., "Zanzibar and Indian Ocean Trade in the First Millennium CE: The Glass Bead Evidence," *Archaeological and Anthropological Science* 9 (2017): 879-901.

Fig 3.6: String of blue and blue green beads, carnelian and faience. Inv. Nr. F1940/12.90, Rijksmuseum van Oudheden.

While the segmented metalfoil beads from the previous string was a prominent manufacture type from Egypt itself, nearly all beads from F1940/12.90 seem to have been imported from the Indian Subcontinent, and with the addition of a single carnelian and a faience pendant, turned into a small bracelet upon arrival. The small dimensions of the blue-green beads indicate a dating that may range from relatively early times, late Ptolemaic Egypt and the flourish of Anuradhapura, during the last three centuries BCE, to well into the mid and late 1st millennium CE, as import and usage of these beads continued to flourish. As such, this string of beads joins an already worldwide dataset of Indo-Pacific bead distribution, spanning nearly two millennia in time. Indo-Pacific beads came in multiple colours, including bright yellow, red, black, green, darker blue and blue-green. The beads on our RMO string from Egypt clearly seem to have been selected for their blue and faintly green-blue colour coincidence. Preferences and parallels for this colour type are also known from a wide variety of excavations: with a notable example from Zanzibar, where both the earlier small beads and the later beads with larger dimensions were recovered (Fig. 8).

In recent years, chemical analyses of Indo-Pacific beads through XRF has accumulated a valuable corpus of comparable materials. The scientific analysis of the RMO beads, therefore, not solely relies on or contributes to the determination of the material properties of the beads themselves, but can also contribute to this growing corpus of scientific results that helps us reconstruct the globe-spanning networks through which these tiny glass beads travelled, and continued to travel for a long time. Recent results especially from East-African sites south of Egypt (Fig 9.),

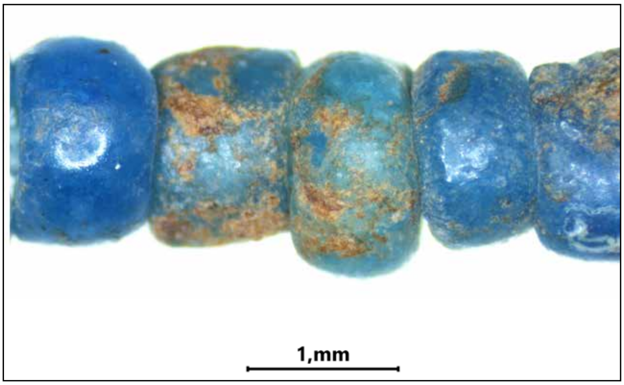


Fig 3.7: Blue and blue green Indo-Pacific beads, Egypt (F1940/12.90) Langbroek & Van Aerde 2022.

Fig 3.8: Blue and blue green Indo-Pacific beads, Zanzibar. After Wood et al. 2017, Fig. 17.

indicate that Egyptian beads trade, productions, and adaptations continued to flourish throughout the 1st millennium CE across the African coast.[17] Simultaneously, we find remarkable applications of the beads in Merovingian grave contexts in Northern Europe, as well (Fig. 10).[18]

At present, many more XRF results are published of recently excavated and/or newly re-examined sites from south-east Africa and from early medieval European contexts, than of Egyptian beads. One of the main, practical reasons for this is the fact that most known beads from Egypt were excavated as early as the nineteenth and early twentieth centuries and the vast majority of them are currently kept in archives and museum collections with minimal object and contextual details on

17 Wood et al. 2012, "Glass Finds from Chibuene, 59-74; Wood at al, "Zanzibar and Indian Ocean,"; Van Aerde & Botan, "Trade Dynamics".

18 Pion & Gratuze, "Indo-Pacific glass beads", 51-64.

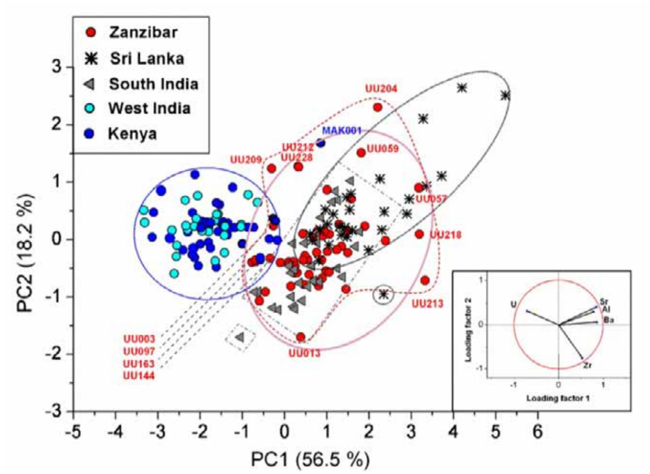


Fig 3.9:Chemical analysis : Wood et al. 2017, Fig. 4. PCA of m-Na-Al samples, comparing beads from Zanzibar to datasets from Sri Lanka, India, and Kenya.

Fig. 3.10: Blue-green Indo-Pacific beads from grave 170 La Tour-de-Peilz, Clos d'Aubonne, Switzerland. Pion & Gratuze 2016, Fig. 18.

record. Only now, with the introduction of scientific methods and tools, like XRF, can these objects once again be applied to wider research scopes. While the quantity of beads known from Egyptian excavations is very high, they remain underrepresented in modern provenance studies because of these practical reasons: in the past, the lack of contextual records made interpretation of these beads difficult, but technological innovations have changed this. Now, it is up to researchers and museums alike to turn towards collaborative, interdisciplinary methods and studies, in order to incorporate these numerous and valuable Egyptian datasets into the most current discourse and interpretations of exchange networks throughout Antiquity and early medieval times. This will allow museums to expand individual object records with new insights and facts, and at the same time it fills the current gap in Egyptian data in the most current bead studies. Just as Egypt was a prominent hub for bead exchange and production in the past, Egyptian beads can likewise facilitate important connections and insights in bead research today.

Our current collaborative bead study with the Rijksmuseum van Oudheden has nearly reached its final stage. So far, the initial results of our microscopy and comparative research have been presented at the International Congress of Byzantine Studies in Venice, in August 2022. The results of our XRF analysis will further consolidate these findings and, importantly, in this way, confirm the RMO beads, despite their limited collection records, as archaeological materials that are both highly valuable and suitable for scientific analyses and wide-ranging interpretative studies.

Corresponding author:
M. van Aerde, Faculty of Archaeology, Leiden University
m.e.j.j.van.aerde@arch.leidenuniv.nl