

Glass News

Published by The Association for the History of Glass Ltd
www.historyofglass.org.uk

January 2018

Number 43

ISSN 1362-5195



Frontispiece: Glass beads from excavations at Igbo Olokun, Ile-Ife, Nigeria, AD 1000–1500. Photo © Abidemi Babalola. See pp. 11–14 for a report on these.

Welcome to a bumper issue of *Glass News* 43! We start by thanking everyone who contributed to the success of our two-day conference ‘Glass of the Caesars @ 30’ held at the British Museum in November, in association with the British Museum Departments of Greece and Rome, and Scientific Research. Enormous thanks to Martine Newby for the huge amount of work she put into organising it, with assistance from Andrew Meek, Ashley Fernandez, Thorsten Opper and Lesley Fitton from the British Museum, as well as Jill Dymock and Didier Haspelslagh. Accounts of the meeting are included inside.

The November AGM saw some changes to the Board. We welcome Jill Dymock who takes over from Angela Wardle as Treasurer, and we thank Angela for all her dedicated hard work in that role; she remains on the Board. Caroline Jackson and Simon Cottle have stood down from the Board. We would like to thank them for their contribution to the AHG. Caroline first joined the Board in 2004, was President from 2007 to 2011, and rejoined the Board in 2013. As well as jointly organising meetings such as ‘Neighbours and Successors of Rome’ in York in 2010, and ‘A Miscellany of Glass’ in London in 2015, she presided over the redesign of the website, and jointly edited the AHG publications *Neighbours and Successors of Rome* (2014), and *Glass of the Roman World* (2015). Simon joined in 2014, and has been a

valuable link with The Glass Circle, with whom we held a joint meeting ‘Glass for Eating, Drinking and Making Merry’ in 2015.

David Crossley

We regret to announce the death in early December of David Crossley, a long-serving member of the AHG Board. He joined the Board in 1983 and only resigned earlier in 2017, serving as Treasurer from 1996 to 2005. David was well-known for his excavations of medieval and early post-medieval glass furnaces, and for championing the archaeological investigation of a wide range of industrial sites. A full obituary will follow in the next issue of *Glass News*.

The next AHG meeting will be ‘Analysis and Synthesis: Vital Aids to Understanding Glass History’, to be held in London in the Spring. Other glass meetings planned for 2018 include the AIHV conference in Istanbul in September.

Grants are awarded every year by the AHG, and this issue contains three accounts of those interesting projects, on glass from Ile-Ife in Nigeria, Campania and Thessaloniki. Mark Taylor outlines recent work on reconstructed Roman glass furnaces, and Colin Brain discusses a gilded 17th-century glass with lion-mask stem. There are details of David Grose’s new book on glass from Cosa, and we include reviews of books on the glass from Thessaloniki, and Indo-Pacific beads.

The editors would like to thank this issue’s contributors for their material; please continue to send anything you think would be of interest, particularly new glass finds, however small. We are always happy to receive long or short pieces about glass research or discoveries.

Subscriptions and memberships for 2018–2019 are due in **April**, and a form is enclosed to send with cheques to John Clark. **New members who joined at the ‘Glass of the Caesars @ 30’ conference in November, and any new members who have joined since then, are reminded that their subscription is valid for next year, until March 2019 – and they do not need to renew it now.**

While every effort is made to check the content of the articles and reviews, Glass News does not accept responsibility for errors.

AHG SPRING STUDY DAY

Analysis and Synthesis: Vital Aids to Understanding Glass History

Unfortunately it has not yet been possible to identify a suitable venue for the Spring 2018 study day. The study day was tentatively planned for the end of April and as usual the Board aimed to hold it in London and to keep the cost of attending as low as possible. If any member is aware of a low-cost London venue suitable for the Association to hold future study days could they please contact Colin Brain (cbrain@interalpha.co.uk).

If it proves possible to locate a suitable venue in time for the study day to be run in April as planned, details will be made available on the website (www.historyofglass.org.uk).

THE ASSOCIATION FOR THE HISTORY OF GLASS

Registered charity 275236

Board of Management

President: Colin Brain
Hon Secretary: Denise Allen
Hon Treasurer: Jill Dymock

Members of Board

Justine Bayley	Suzanne Higgott	Jennifer Price
John Clark	Andrew Meek	Daniela Rosenow
Sally Cottam	Martine Newby	Rachel Tyson
Chloë Duckworth	Haspeslagh	Angela Wardle

AHG GRANTS

Grants are available from the Association for the History of Glass, for educational or research activities consistent with the Association's charitable aims. These could include, for example, attendance at a conference to present a lecture or poster, a study visit, fieldwork, or publication of scholarly works. There are no restrictions on who may apply or on the topics of applications, which will be judged on merit. Multiple applications in different years will be considered with individual awards up to £500. A list of grants that have previously been awarded can be found on the AHG website.

An application form may be downloaded from the website, or can be obtained from the Honorary Secretary, Denise Allen at 12 Birchy Barton Hill, Exeter EX1 3ET. Email: denise_allen52@hotmail.com.

CONFERENCES

21st Congress of the International Association for the History of Glass

3rd–7th September 2018
Istanbul

AIHV21

ISTANBUL TURKEY 2018

ASSOCIATION INTERNATIONALE POUR L'HISTOIRE DU VERRE
INTERNATIONAL ASSOCIATION FOR THE HISTORY OF GLASS



The 21st International Congress of the Association Internationale pour l'Histoire du Verre will be held in Istanbul, Turkey, 3rd–7th September 2018.

May 2018 Announcement of draft programme.
30 June 2018 Deadline for booking with early registration discount.

For more details see <http://aihv21.istanbul.edu.tr/en>

Society of Glass Technology Annual Conference

Glass and The Meeting of Minds

2nd–5th September 2018
Murray Edwards College, Cambridge

For four millennia, glass has occasioned the meeting of minds. Obsidian and glassy fulgarites excited the imagination of our remote ancestors, who found artistic and practical applications for this most magical of substances. Alchemists gloried in the glass which allowed them to see the transformation of base substances within their alembics. Without glass, advances in medical science would have been unattainable. The mystical fusion of colour and light stimulated the spirituality of those who knelt in medieval cathedrals, impacted by the glorious stained glass windows.

And today? The meeting of minds goes on. We invite authors and presenters from any and all fields of glass creativity to send us their abstracts. If you are interested and would like to know more please send us an email, to abstracts@sgt.org.

See <http://cambridge2018.sgt.org/about>.

Borg Furnace Project 2018

In Germany, Archeoglas will be visiting the Roman Villa Borg from June 4–10 2018 to continue their experimental archaeology ‘Borg Furnace Project’: www.archeoglas.de.

MEETING REVIEWS

‘Glass of the Caesars @ 30’: Joint conference between the AHG, and the British Museum Departments of Greece and Rome, and Scientific Research

When, in 1987, I arranged a visit to the ‘Glass of the Caesars’ exhibition for my school archaeology society while in the sixth form, I had no idea what an influence it would have on the future direction of my archaeological interests. The original exhibition was also responsible for sparking the start of The Roman Glassmakers following Mark Taylor’s visit. Susan Walker spoke of it at ‘Glass of the Caesars @ 30’ as having been ‘a revelation’ and ‘a life-enhancing experience’.

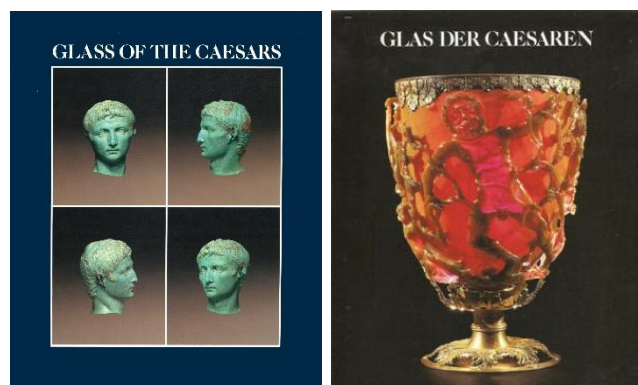
All these years later, ‘Glass of the Caesars @ 30’ has been an exhilarating, informative and unforgettable experience. It is impossible in the space available here to cover the extent of papers, posters, visit to the ‘Scythians’ exhibition, and evening meal sufficiently. We include two accounts of it, summarising some of the highlights, and the scientific papers.

Rachel Tyson

Glass of the Caesars @ 30

The idea for this conference, 30 years after the great exhibition at the British Museum in 1987, came from Martine Newby Haspelslagh, who had helped to organise the original and had commented more recently ‘I can’t believe it’s nearly 30 years...’. In fact, 30 years is a good unit of time by which to measure change, since in 2017 in Western Europe it represents about a generation – my grandchildren are now the age my children were when I attended.

Martine opened the conference by remembering the exhibition, and paid homage to those pioneers of Roman glass studies who had inspired it, most of whom have now passed on. Two of the speakers at the conference in honour of Donald Harden, held at the Society of Antiquaries to coincide with the exhibition, came to GoC @ 30 – Jennifer Price and Marianne Stern – and chaired sessions. Martine also revealed the story behind the



The front covers of the English and German editions of the original exhibition catalogue

different covers for the catalogues produced at the different venues – the naked Lyncurgus was considered too risqué for the US version, also used by the BM. This meant that an object (a portrait bust of Augustus) which later turned out not to be made of glass at all appeared on the British and US versions...

Aside from this piece, the Glass of the Caesars brought together vessel glass of the most luxurious kind – a collection of art history treasures. This conference was much more wide-ranging, including papers on inlays, windows and glass gemstones as well as a wide array of vessels, looking at experimental production methods, analysis, patterns of trade and manufacture, conservation techniques, data analysis, as well as the reinterpretation of one vessel which had appeared in the exhibition.

The purpose was to assess the changes in knowledge and understanding of all aspects of Roman glass, as well as the approaches to research and dissemination of results. Sylvia Fünfschilling in the second paper of the conference, and the panel of experts summing up at the end did a good job of emphasising what an impact changes in technology have had. The ease now of instant communication and the processing and storage of data, as well as huge advances in analytical techniques, have made a huge difference. This should mean that information and ideas can circulate (whilst maintaining the proper checks and respecting individual research projects) and there were thoughts on such things as a central database.

Fortunately people still want to get together in one room and talk about Roman glass – the 25 lectures over the two days were given by scholars from 10 different countries, and amongst the 110 delegates 21 countries were represented. In addition there was a splendid array of posters on show, with people keen to talk about them. Many talks and posters were presenting the work of more than one researcher, and they showed the vigour of the far-ranging field of Roman glass studies. The grouping of

the talks into sessions had been skilfully done by Martine, so that themes on particular vessel types and decorative groups could be explored.

The Portland Vase got a good mention, as it had in 1987, and it is wonderful that even the field of figurative interpretation is open to change. New ideas on the production technique of cameo vessels based on state-of-the-art technological study were also aired. This is generally a field which still attracts some controversy, but experimental reconstruction of ancient technology, such as that at Borg described by Frank Wiesenberg, is invaluable.

Some exquisite new finds were introduced, such as the engraved glass bowls found in excavations in Istanbul, as were reconstruction techniques of old finds. Stephen Koob from the Corning Museum of Glass described advances in conservation methods using their wonderful Paraloid B-72, and a project to reconstruct window panes from old displays in Compiègne, France was illustrated by Anaïs Braja. New ways of looking at assemblages were discussed by Sally Cottam, with reference to British finds, and Anastassios Antonaras, with regard to Greece.

The model of the manufacture of raw glass in eastern Mediterranean areas, with more widespread secondary workshops for working this into vessels and other artefacts was barely apparent in 1987. It was further explored by several speakers at this conference, and Ian Freestone explained the light that recent scientific analysis has thrown on the development of glass technology. This is, no doubt, an area where more changes in ideas will occur as techniques develop.

The AHG, as the British branch of the AIHV, was nearly 10 years old in November 1987 (inaugurated January 1978). The grant scheme for helping research projects began in 2006, and it has been helpful to many people since then, including a number who were speaking and presenting posters at this conference. It seemed that all those who attended went away with heads buzzing with ideas and excitement at what had been aired. Martine was integral both to the original exhibition and catalogue, and to the organisation of this conference, and is to be congratulated for seeing the whole thing through – 30 years and beyond!

Denise Allen

FACEBOOK AND TWITTER

To keep up-to-date on news and current research on the history of glass visit:

[facebook.com/TheAssociationForTheHistoryOfGlass](https://www.facebook.com/TheAssociationForTheHistoryOfGlass)

Click 'Like' and please share.

Follow us on Twitter: @Ass_Hist_Glass

Glass of the Caesars @ 30: Review of Selected Scientific Papers

The 'Glass of the Caesars' exhibition, which opened in 1987, had a terrific impact on the people involved and for a number of people began a lifelong interest in glass. Day 1 began with Martine Newby, organiser of the Glass of the Caesars @ 30 conference and involved in the original, who gave a fantastic opening talk on the original conference. She shared stories of the pitfalls and lucky occurrences – the wobbly cases, the visit by the Queen, and the stress of watching postal workers (who refused to let the women conservators intervene) move parcels containing such priceless cargos. It was a vivid portrayal of a highly successful event, although tinged with poignancy with the passing away of so many significant names since.

Stephen Koob (*'Advancements in the conservation of Roman glass since Glass of the Caesars'*) demonstrated the wonder of modern conservation: highlighting the efficacy of Paraloid B-72 as an adhesive but also in loss compensation. The ability to colour the resin made infills almost imperceptible to the eye, resulting in perfectly restored vessels.

Ian Freestone (*'The Jerusalem Workshop – Considerations from the perspective of scientific analysis'*) described an assemblage of glass tubes and hemispherical bowls from a 1st-century BCE glass workshop. The tubes, closed at one end and partially inflated, were posited as evidence of initial stages in the development of glass blowing. He further noted that the use of a ceramic rod as an intermediate stage before iron blow pipes seemed unlikely.

Yael Gorin-Rosen (*'Glass production at Jalame: Reconsideration and news from recent excavations'*) presented the results of exciting new excavations in Israel: there are now 10 identified primary production sites and around 100 secondary workshops. Recent work at Jalame found 4 large furnaces, providing new details on furnace design, including possibly chimney foundations. These sites have altered the image of the industry, indicating closer proximity of primary and secondary production, and also the association of glass working to other industries, especially agriculture.

Frank Wiesenberg (*'Reconstructed Roman glass workshops in operation – Problems and first results'*) spoke on the importance of experimental reconstructions for our understanding of glass working practices, fuel consumption, furnace temperatures, and furnace design, particularly annealing ovens (lehrs) often missing from the archaeological record. Volunteers are requested for the newest reconstruction just started at Villa Borg, Germany.

Souen Fontaine (*'Contribution of maritime sites to the history of the trade in Roman Glass'*) reported on the trade in raw glass as evidenced from finds at port locations, such as Arles Harbour, the trade gateway into France and Northern Europe, and from 4 shipwrecks. The most recent of these, the Cap Corse 2 dating to the 2nd century, contained 10 tonnes of raw glass.

Marie-Dominique Nenna (*'Innovation and tradition in glass craftsmanship of Graeco-Romano Egypt'*) provided an excellent overview of the 10 primary furnaces now identified in Egypt, highlighting sites at Antinoe and Ostrakine. She also noted that plant ash glass makes an early appearance in periods dominated by natron glass, such as kohl containers from Tebtynis.

Eleni Tessa (*'Opus Sectile glass pieces of the 2nd century CE in imitation of real marmora from the Collezione Gorga, Rome'*) gave a very good paper on the use of glass in the imitation of stone. The results were remarkable, with recreations of marbles, onyx, breccias and even the purple and green porphyry in glass. The glass demonstrated the amazing skill and attention to detail of the glass worker.

The speakers from day 2 included Sally Cottam (*'A rather colourful past: Identifying and interpreting changes in later 1st-century CE vessel glass in the Western Empire'*) who, using the vast corpus of assemblages from well-dated sites in Western Europe, demonstrated a sharp reduction in polychrome vessels during the latter half the first century CE in favour of self-coloured and decoloured vessels.

The talk by Richard Whiteley (*'Rethinking the manufacture of Roman cameo glass'*) was particularly eagerly awaited. On a controversial subject already published as a feature in the Daily Mail during the preceding week, it promised a potentially interesting question session. However, while he explained the scientific techniques well – the use of computer tomography with X-rays to map the internal structure and bubbles inside a fragment of cameo glass – and his knowledge of glass working appeared extensive, it was difficult to fully follow how the results altered our current thinking on the manufacture of cameo glass. In the questions the delegates took exception to his interpretation of numerous surface striations as evidence for tool working and instead suggested weathering; however, the questions were much too brief and a much fuller discussion of this topic would have been welcome.

Katja Broschat (*'Marvered and marvellous. Using colours to identify and reconstruct the techniques of cage-cup production'*) gave an excellent paper investigating the 4th-century Yambol cage cup from Bulgaria. A beautiful find, it consisted of 5 colours (colourless, 2 blues, a turquoise and red (although she notes that 'men' normally see this as brown)), the most of any cage cup yet found. Each colour was analysed and the manufacture investigated, concluding that the colours were added as thick trails and then marvered to create coloured bands. This was a well-explained paper with some great images.



The final 'round table' discussion (Sally Cottam, Anastassios Antonaras, Sylvia Fünfschilling, Marie-Dominique Nenna, Ian Freestone, Sid Goldstein and Martine Newby. Photo © Andrew Meek

The day ended with a discussion: Sylvia Fünfschilling recognised the importance of compositional analysis but reminded scientists to include typology and chronology in their publications. Marie-Dominique Nenna highlighted the need, given the huge quantities of data being produced, for more synthesis work bringing together the disparate pieces of information. But all agreed that important progress had been made. Overall this was an excellent conference, well attended, with papers well demonstrating the enormous progress in our understanding of Roman glass over the last 30 years.

Matt Phelps

Post-AD 79 Roman Glass from Campania, Italy: the Assemblage from the Villa Baths at Pollena Trocchia

T.M. Penn, PhD Candidate in Classics, University of Edinburgh.

tim.penn@ed.ac.uk

Studies of Roman glass from Campania focus principally on assemblages from sites buried by the AD 79 eruption of Mt. Vesuvius. Published 2nd to 5th-century glass from this region is principally limited to three sites: the Carminiello ai Mannesi Insula (Miraglia 1994) and theatre (Del Vecchio 2010), both in Naples, and the Basilica of S. Felix at Cimitile outside Nola (Stiaffini 1993). The AHG's generous financial support afforded me the opportunity to spend May and June 2017 studying a new post-Pompeian assemblage from the villa bath complex at Pollena Trocchia in order to begin filling this gap in existing research. I will present here a brief summary of my findings for *Glass News* readers in advance of a more detailed report which is currently in preparation.

The site, discovered in 1988, lies on the lower north-western slopes of Mt. Vesuvius. It was used for illegal waste disposal before archaeological excavations carried out by the Apolline Project began in 2004. The site comprises a series of rooms relating to a private bath built directly atop the ashes from the AD 79 eruption, which provide its foundations. Dating from tiles within the hypocausts of the bath suggest a late 1st/early 2nd-century AD construction. After around two centuries of use, the collapse of part of the building led to partial abandonment; the area was subsequently used as a refuse dump, as well as seeing the deposition of several infant burials. The complex was buried by an eruption in AD 472 and was partially reoccupied shortly afterwards. Occupation then ceased following a subsequent volcanic event in either AD 505 or 512. The site has been disturbed through activity in antiquity and illegal dumping during the 1980s and 90s, but study of the ceramics reveals material dating to the 2nd–5th centuries, with ca. 90% of sherds dating to AD 450–472; a similar Late Antique chronology seems broadly applicable for the glass.

My study examined glass from the 2014–2015 field seasons, forming circa 20–25% of the total glass from the site and therefore providing a representative sample of the overall assemblage. The vessels were fragmentary and often heavily weathered, sometimes hindering analysis. As a result, of the 155 individual vessels

recovered, 42 (27%) were too fragmentary to assign shapes. The majority of identifiable vessels were open forms (54%), with a substantial minority of closed forms (19%). The dominance of open forms fits the pattern in Naples (Del Vecchio 2010, 135; Miraglia 1994, 342), though perhaps not at Cimitile, where closed forms were more common (Stiaffini 1993, 310). The contrasting scenario at Cimitile may reflect the differing natures of these sites. Whilst the Naples sites reflect assemblages for domestic and/or commercial use, the highest concentration of glass found at Cimitile was found outside the western apse of the basilica, in proximity to graves. We may tentatively suggest that the closed forms recovered there were connected to cultic activity or graveside ritual.

The vessel rims are a proxy for the colours of the broader assemblage. Colourless glass, including fabrics with very faint colouring (57, 37%), and pale green glass (36, 23%) were most common, with the remainder (20, 13%) comprising a range of colours (turquoise, pale blue, dark green, mixed colourless/dark green). 42 (27%) were too weathered to identify. The emphasis on pale green fabrics is consistent with regional trends (Del Vecchio 2010, 136; Miraglia 1994, 341; Stiaffini 1993, 313).

Some finds from Pollena are closely paralleled elsewhere in Campania. These include a beaker (No. 5) with a flaring rim (Miraglia 1994, 335, no. 57) and two bowls (Nos. 6–7) with out-turned rims. The first bowl corresponds closely in form to an example from Carminiello (*ibid.*, 335, no. 69), whilst the second matches the form and lightly incised decoration of another Carminiello vessel (*ibid.*, 335, no. 70). These forms date to the 5th–6th centuries, and are therefore compatible with the chronology suggested by ceramics.

Other vessels found at Pollena bear looser comparisons to finds from Campania. A bifurcated handle (No. 1) may belong to a vertical-handled lamp attested at Carminiello (Miraglia 1994, 339–40, nos. 118–120). A possible bowl or lamp with a tubular rim (No. 2) resembles a larger example from the Naples theatre (Del Vecchio 2010, 136, fig. 71, no. 12). A fragmentary pair

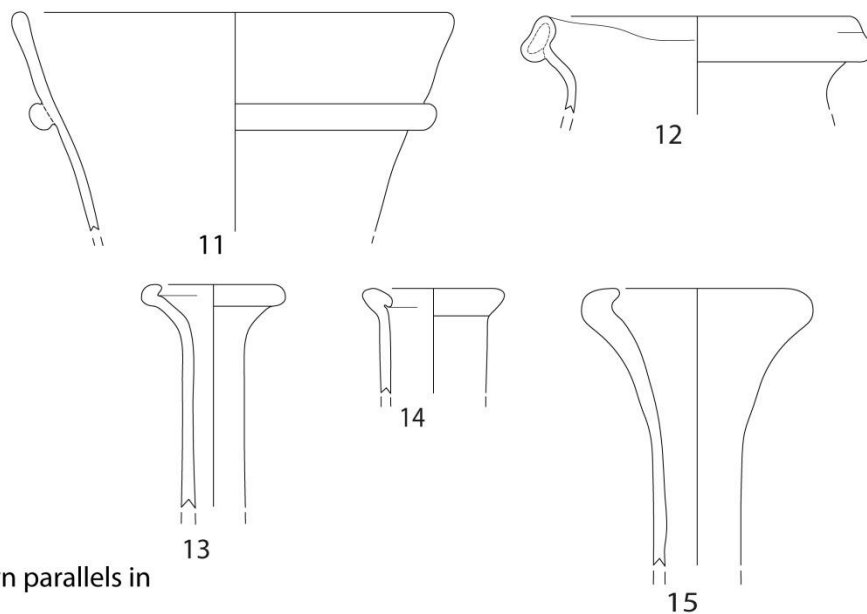
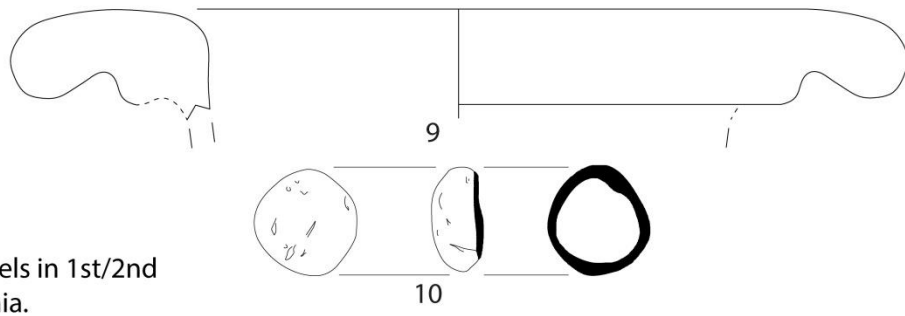
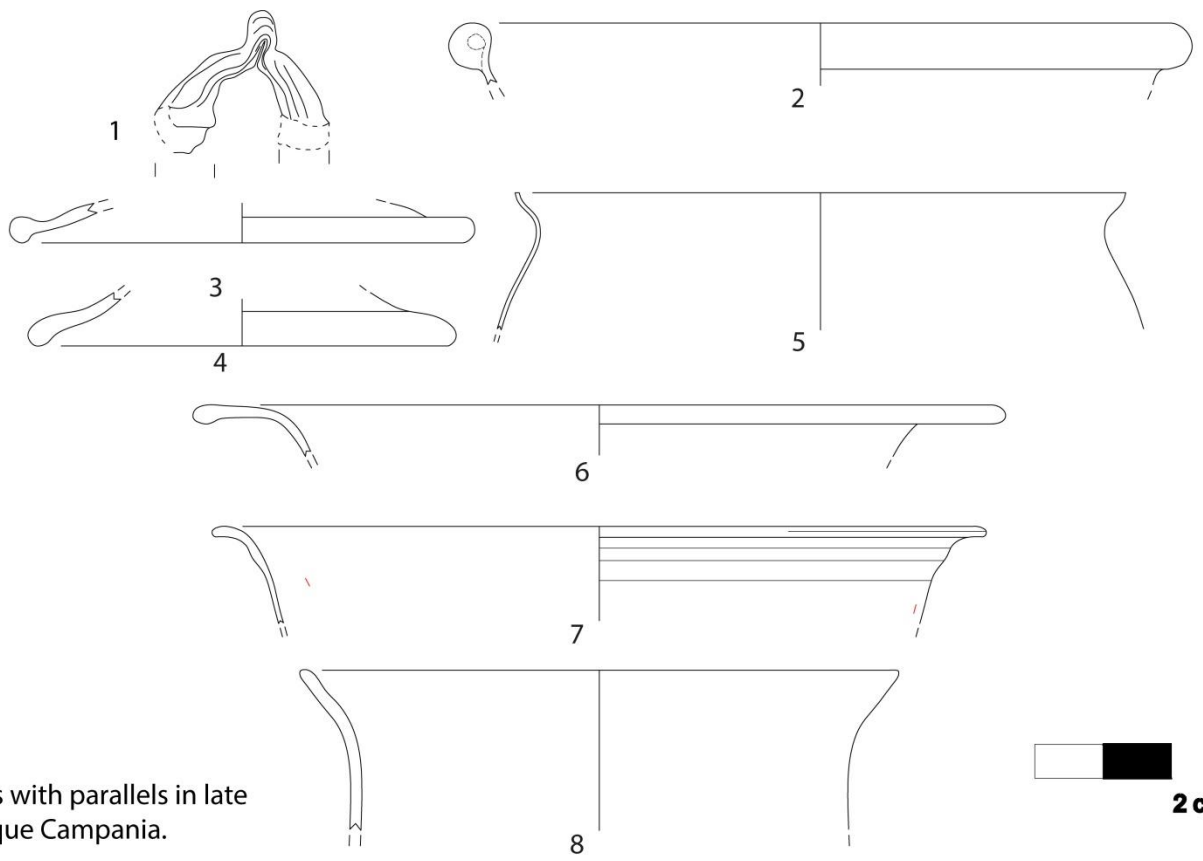


Figure 1: A selection of glass objects from the Masseria de Carolis Villa, Pollena Trocchia. © Tim Penn

of colourless bases (Nos. 3–4) may relate to stemmed goblets (Isings form 111) from the Naples theatre (Del Vecchio 2010, 136, fig. 71, no. 15) with slightly different inclination, though the fragmentary nature of these vessels means that alternative identifications as lids/rims remains possible. These examples again all support a 5th-century date for much of the glass from Pollena.

These forms also find parallels in the wider Roman world. In particular, similarities are found within the Italian peninsular at sites in Lazio and along the Adriatic coast; the possible stemmed goblet bases (Nos. 3–4) are not dissimilar from 5th-century examples from the *Scholar Praeconum* in Rome (Whitehouse et al. 1985, 169–170, fig. 5, no. 52). The bowl with incised decoration (No. 7) seems to be comparable in form to material dated to the 4th–5th centuries from *domus B* at *Herdonia/Ortona*, dated to the late 4th–middle of the 5th centuries (Giuliani and Turchiano 2003, 153, fig. 12, no. 4). A conical beaker (No. 8) also resembles an example known from the same area of *Herdonia* (*ibid.*, 153, fig. 12, no. 2). These similarities suggest the inhabitants of the villa at Pollena shared habits of glass consumption with other communities across central-southern Italy and beyond during late antiquity.

While there are a number of forms that clearly fit a 5th-century date, there are also some items with a possible earlier date. One example is a vessel in a turquoise fabric with a horizontal folded rim, the edge being bent out, up, in and then flattened (No. 9). It is very probably from an Isings form 50/51 (cylindrical or prismatic bottle with a wide neck), though it might also be from a jar, either an Isings form 63 (bulbous jar with M-shaped handle) or 64 (jar with omega-shaped handle); the highly fragmentary nature of the rim renders certainty impossible. All these forms can be dated to between the second half of the 1st century and the end of the 2nd century (though a few examples of Isings form 50/51 have been placed as late as the mid-4th century). Although not strictly vessel glass, another notable object possibly of a relatively early date is a single find of an opaque black glass counter with sub-hemispherical form (No. 10). This is similar to 1st-century AD examples from Pompeii insula VI.i, recently published by Cool (2016), which may have been used for gaming. Although it is not presently clear when these objects ceased to be produced, the appearance of one example on a post-Pompeian site argues for continuity in one aspect of glass consumption after the AD 79 eruption of Vesuvius.

Other vessels find either very loose parallels or none at all elsewhere in Campania. A flask (No. 11) with a

trailed glass band on the exterior resembles specimens from Carminiello (Miraglia 1994, 337, nos. 78–88), dating from AD 450–475 onwards, but these published examples lack comparable decoration. Other examples of closed forms, including a bottle or flask with a loosely-rolled and slightly pinched/squashed tubular rim (No. 12) and several unguentaria (Nos. 13–15) are without published parallels; 5th–6th-century unguentaria are attested at Cimitile (Stiaffini 1993, 305–6) but no drawings are available to permit comparison.

I am grateful for AHG's financial support, which permitted me to work on this glass assemblage. I also particularly enjoyed presenting this research as a poster to AHG members and other attendees at the 'Glass of the Caesars @ 30' event at the British Museum in early November 2017; I would like to express my gratitude to all those who took the time to provide detailed and helpful comments and feedback. I now look forward to completing the preparation of this preliminary study for publication in *Rivista di Studi Pompeiani*.

Key references

Cool, H.E.M. 2016. *The Small Finds and Vessel Glass from Insula VI.1 Pompeii: Excavations 1995–2006*. Oxford: Archaeopress.

Del Vecchio, F. 2010. 'I Vetri.' In Baldassarre, I. et al., *Il teatro di Neapolis: scavo e recupero urbano*. Naples: Soprintendenza speciale per i beni archeologici di Napoli e Pompei, 135–136.

Giuliani, R. and Turchiano, M. 2003. 'I vetri della Puglia centro settentrionale tra Tardoantico e Altomedioevo.' In Piccioli, C. and Sogliani, F. (eds.), *Il vetro in Italia meridionale ed insulare*. Naples: AIES beni culturali, 139–159.

Isings, C. 1957. *Roman Glass from Dated Finds*. Groningen: JB Wolters.

Miraglia, G. 1994. 'Vetri.' In Arthur, P. (ed.), *Il complesso archeologico di Carminiello ai Mannesi, Napoli (Scavi, 1983–1984)*. Naples: Congedo Editore, 329–342.

Stiaffini, D. 1993. 'I materiali vitrei.' In Pani Ermini, L. et al., 'Recenti indagini nel complesso martiriale di S. Felice a Cimitile,' *Rivista di Archeologia Cristiana* **69**, 223–313 (304–313).

Whitehouse, D., et al. 1985. 'The Schola Praeconum II.' *Papers of the British School at Rome* **53**, 163–210.

A *Non-finito* Flask and the Glass Products of Roman Thessaloniki

Anastassios C. Antonaras

Curator of Antiquities
Museum of Byzantine Culture, Thessaloniki

The author's book *Glassware and Glassworking in Thessaloniki, 1st Century BC – 6th Century AD* published recently with the generous support of the AHG, examines glass production and distribution in this major Balkan urban centre and port on the basis of 90 years of controlled excavations in the area. Among the glass vessels identified are probable local products. Indications of four Late Antique glass workshops have been unearthed, three of them in the central parts of the city and just one in the eastern necropolis. Most of the

forms of the local products can only be deduced on account of their large numbers, as deformed or unfinished vessels have only occasionally been found on these production sites.

The extremely large numbers in which two forms of 1st-century AD unguentaria - spherical with irregular cracked-off rim, and bird-shaped ones - appear, gives rise to the conjecture that they were also made in Thessaloniki. Stronger indications for the local

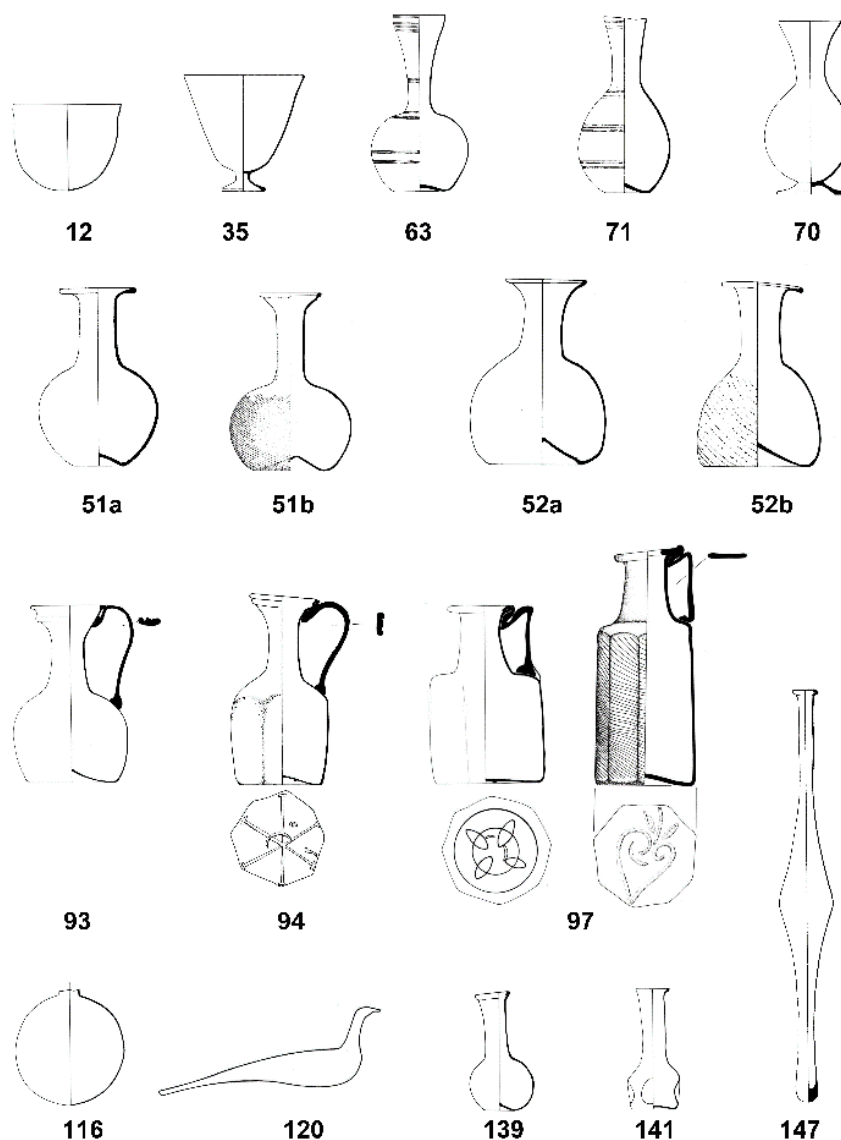


Figure 1: Probable glass products from Thessaloniki. © A. Antonaras and Archaeopress

production of glass vessels, almost always indirect, can be traced from the 4th to the 6th centuries, a period to which all the following forms can be ascribed. Tableware is represented by spherical, pear-shaped and octagonal bottles; spherical and ovular funnel-mouthed flasks with inherent or plain base; and hemispherical and eight-sided jugs. In addition, drinking vessels are represented by hemispherical bowls and stemmed beakers, some of which bear stamped numerals. Furthermore, forms of lamps like stemmed lamps, three-handled bowls and stemmed beakers have been detected. Finally, a few forms of unguentaria are considered to be local products, namely, small-sized with spherical and indented cubical body; and very large fusiform unguentaria.



Figure 2: Unfinished and fully blown and finished flask of the same form. Thessaloniki, eastern necropolis, 4th century. Photo © A. Antonaras and Archaeopress

A fortuitous and unique find of a blank vessel offers proof for the local production of one of these forms. It is a flask, examples of which are found in considerable numbers both intact and in fragments, in dwelling areas, as well as in tombs in the eastern and western necropolis of Thessaloniki. In the typology established in my book they are referred as *Spherical vessels with funnel-mouth and plain base (Form 63)*, and they are dated to the 4th century. They have an unworked rim, funnel-mouth,

long cylindrical neck, globular body, and slightly concave base. All examples are decorated with shallow, horizontal, incised bands. Their height ranges between 16 and 22cm. Actually, this form represents a local, more slender variant of Isings Form 104b (Isings 1957, 123–125). There are seven better surviving examples, presenting one of the most numerous group of flasks in the city in addition to the example of the locally preserved *non-finito* vessel of the type, which is a perfectly shaped example that had never been fully blown to its normal dimensions. This vessel was unearthed in a probably double-chambered, barrel-vaulted tomb, part of a complex of twelve graves (Michailidis 1967). The rim of the vessel is still uncut, retaining even a short cylindrical ending, part of the crack-off of the moil. Its unfinished character is also suggested by the lack of a pontil mark on its base, while all other examples of this form bear a characteristic annular scar at the centre of their base. The fact that it is a plain, utilitarian vessel is an additional argument for the hypothesis that it is probably not an import to 4th-century Thessaloniki. On the contrary, it appears to be a local product that was left unfinished, either because it was meant to be used as a cheap burial offering, or by pure chance, due to reasons that are obscure today. Similar *non-finito* vessels are published that have been found in the western parts of the Empire (Price and Cool 1989; Goethert-Polaschek 1977). Their single common characteristic is that they all, like the Thessalonian example, have a wheel-cut rim that was finished when the vessel had cooled. When the vessel had been annealed, the glassworker would cut the moil, i.e. the truncated conical part between the blowpipe and the final rim of the vessel, and subsequently finish the rim by polishing it.

Goethert-Polaschek, K. 1977. *Katalog der Römischen Gläser des Rheinischen Landesmuseums Trier*, 153, no. 917 pls. 59 and 252, no. 1458, pl. 16/176d.

Isings, C. 1957. *Roman Glass from Dated Finds*. Groningen: JB Wolters, 123–125, form 104b.

Michailidis, M. 1967. ‘Βορείως Πανεπιστημιούπολεως’, *Archaeologikon Deltion* 22, Chronika B2, 437–438, pl. 324.

Price, J. and Cool, H.E.M. 1989. ‘The evidence for the production of glass in Roman Britain’. In Foy, D. and Sennequier, G. (eds.), *Ateliers de verriers de l’Antiquité à la période préindustrielle*, Actes des 4èmes Rencontres de l’Association Française pour l’Archéologie du Verre, 24–25 novembre 1989, 23–30, esp. 25.

Primary Glass Production in Early Ile-Ife, Southwest Nigeria, ca. 1000–1500 AD

Abidemi Babatunde Babalola

Department of Anthropology, Harvard University
11 Divinity Avenue, Cambridge MA, USA
ababalola@fas.harvard.edu

Much of the study of ancient glass production has focused on the Middle East, the Mediterranean, medieval Europe, and Asia, in part, because these regions are believed to have housed the very few centres of primary glass production. Archaeological and historical sources have attested to primary glass production in these centres and pointed at distribution across regions and continents (e.g. Degryse 2014; Freestone et al. 2000, 2002; Freestone 2008; Rehren 2016). However, Sub-Saharan Africa appears to have received limited attention when it comes to primary glass production. Lack of data to support primary production, the idea that no primary production centre existed in Sub-Saharan Africa before European Contact, and the abundant evidence of importation of glass objects into the sub-continent are responsible for the lack of interest in studying primary glass production in early Sub-Saharan Africa. The work of Lankton, Ige and Rehren (2006, 146) on glass materials from Ile-Ife, southwestern Nigeria (Fig. 1) recognises the uniqueness of high lime, high alumina glass (HLHA) among the known glass compositional groups from around the globe. It sets the record for the possibility of glass primary glass production from locally sourced raw materials from southern Nigeria or near Ile-Ife.

Since 2010 I have been conducting archaeological investigations at Igbo Olokun – the site of glass production, in Ile-Ife. The project, on the one hand, provided archaeological context to Lankton et al.'s (2006) hypothesis on primary glass production in this region of Nigeria. On the other hand, the research was set to investigate the production techniques and

processes and the prevalence and spread of the HLHA glass in early Ile-Ife as well as among early West African societies. The Association for the History of Glass grant I received in November 2016 was to support my research on the glass production in early Ile-Ife. Specifically, the AHG's grant was to enable me to travel to Nigeria to study the glass crucibles collection stored at the Natural History Museum (NHM) of the Obafemi Awolowo University (OAU), Ile-Ife, Nigeria. During the research visit, I also gave a talk on my research at the NHM and the University of Ibadan (organised by IFRA and the Institute of African Studies). The lectures were titled *Indeed "our ancestors were material scientists"!* *The production of an indigenous glass in Ile-Ife, SW Nigeria (ca. 1000 – 1500 AD)* and *Global science - local technology: Archaeology of glass production in Ile-Ife, Nigeria, eleventh–sixteenth century AD* respectively. In the rest of this short report, I will briefly discuss my research findings so far on early glass production in Ile-Ife and then conclude with a brief description of my activities at the NHM.

Located in the rainforest zone of southwestern Nigeria, Ile-Ife has a deep antiquity and has drawn interest across disciplines for several decades. Early Ile-Ife developed as scattered villages, which coalesced to become a centralised polity from the 10th century AD. By the 12th–15th century, Ile-Ife had become an important urban centre with a centralised political system. During this florescence era, Ile-Ife institutionalised the divine kingship system and established a complex social structure. Ile-Ife also constructed a concentric city wall, paved courtyards and streets with potsherds, and

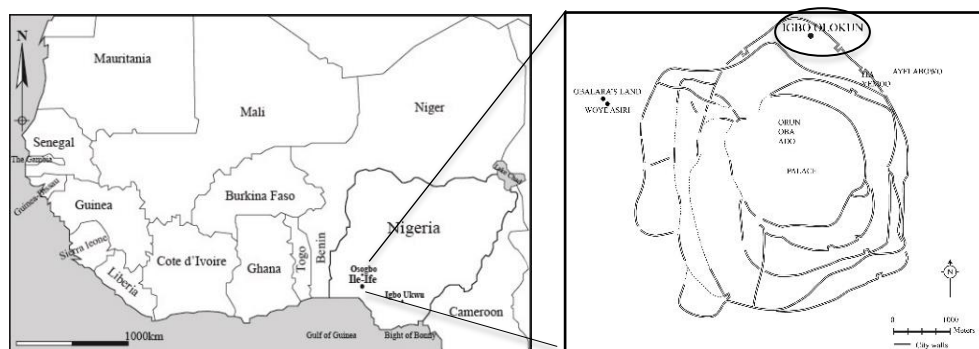


Figure 1: Ile-Ife in the context of Southwestern Nigeria, showing the location of Igbo Olokun in Ile-Ife.
© Abidemi Babalola



Figure 2: Selected glass beads (left) and glass-lined crucible fragments (right) from excavations at Igbo Olokun, Ile-Ife. Photo © Abidemi Babalola

developed sophisticated artistry as indicated in the elaborate pottery decoration, stone carving, terracotta, and naturalistic copper-alloy figures. The artistic prowess of Ile-Ife, its political might, and the abundant farm produce were sources of its wealth. The city also actively engaged in trans-Saharan trade and exchange. Furthermore, Ile-Ife also established a glass industry and locally manufactured glass beads, which became prestige trade goods.

Igbo Olokun, in the northern sector of Ile-Ife (Fig. 1), has been known as a possible centre of glass making and working for over a century (Frobenius 1913). However, various archaeological excavations carried out at the site were either incompletely published or never published. Omotosh Eluyemi (1987) was the first to publish a full report on his investigations at Igbo Olokun; however, the article lacked details of the excavations. Inspired by these previous works, I carried out excavations at the site in 2011–2012. The excavations yielded several thousands of glass beads, numerous glass-lined crucibles, about 3 kilograms of production wastes, and other non-glass related materials such as ceramics and stones (Babalola 2015; Fig. 2).

Compositional analysis of samples of the excavated glass materials from Igbo Olokun by Laser Ablation-Inductive Coupled Plasma Mass Spectrometry (LA-ICP-MS) and Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM-EDS) revealed that most of the samples are of high alumina glass with the HLHA the most common. The other two identified groups are low lime, high alumina (LLHA) and low lime, moderate alumina (LLMA). Table 1 presents the average concentrations of the major elements of the three identified groups. Although Claire Davison (1972)

analysed and reported some HLHA glass from Ile-Ife, Lankton et al. (2006) were the first to recognise the HLHA composition as unique. They argue that the values of lime and alumina in the HLHA glass are high enough to classify the glass as ‘unusual’ (Lankton et al. 2006, 124). Lankton et al. (2006, 128) conclude that ‘the very unusual nature of the HLHA glass is a key’ to establish that there was, possibly, primary glass production centre in early Ile-Ife. The consistency of the concentration of lime and alumina in the glass beads, wastes, and the crucible glass from Igbo Olokun (Fig. 3) further affirms that glass from the three set of artefacts belongs to a single glass making tradition that would have been indigenous to Ile-Ife. The dominance of the HLHA glass from Igbo Olokun and its prevalence in other archaeological sites in Ile-Ife offer an insight into the importance of the HLHA glass in early Ile-Ife. Also, the presence of the Ile-Ife type of glass in other sites across early significant West African communities has demonstrated the substantial place in Igbo Olokun and Ile-Ife in our understanding of the evolution of glass technology and primary glass production in Sub-Saharan Africa (Babalola et al. 2017).

	HLHA	LLHA	LLMA
SiO ₂	62.3	68.7	74.3
Na ₂ O	3.9	6.5	5.6
MgO	0.06	0.9	0.9
Al ₂ O ₃	13.5	12.4	6.5
K ₂ O	3.81	5.1	4.01
CaO	15.2	3.3	4.1
Fe ₂ O ₃	0.6	2.2	3.4

Table 1: Average concentration of the major elements for the HLHA, LLHA, and LLMA Ile-Ife glass (wt%). © Abidemi Babalola

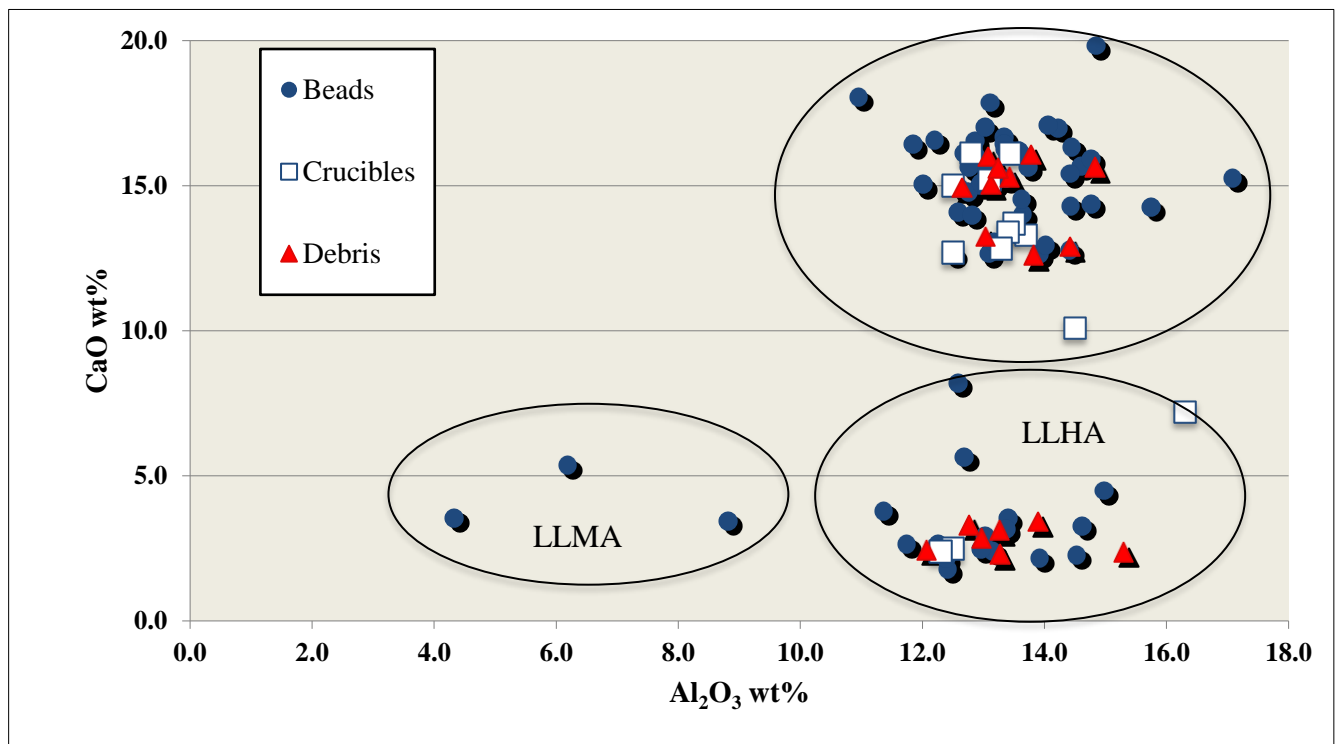


Figure 3: Compositional plot of lime vs alumina concentration in the glass beads, wastes, and crucible glass from Igbo Olokun Ile-Ife, showing the three identified groups. © Abidemi Babalola

While the results of the investigations on the Ile-Ife glass have provided fruitful insights, and shed new lights on aspects of the production of this ‘uniquely African’ glass (Freestone 2006), the need for more evidence pointing at primary production underscores the work on the crucibles from Ile-Ife (Babalola and Rehren 2016). Thus, this investigation has been extended to the collections from Ile-Ife stored in the NHM facility. During one of my recent travels to Nigeria, I looked at the crucible fragments assemblage in NHM and collected fragments of the encrusted glass chunk, suspected semi-finished glass, on the inside of a crucible fragment to the University College London Qatar (UCLQ) Material Science Laboratory for elemental analysis. In the absence of a furnace, semi-finished glass is the most reliable indicator of primary glass production in an archaeological site. During the AHG-supported trip to Nigeria two more crucible fragments with encrusted, possibly semi-finished, glass were identified. Samples of the glass chunk were taken for elemental analysis. Preliminary optical microscopic and SEM-EDS analysis was carried out on the samples at UCLQ. Further analysis is underway on the possible semi-finished glass.

In sum, the study of primary glass production in early Ile-Ife has yielded results that strongly support the existence of primary production of HLHA glass during the classic period in Ile-Ife. The LLHA and LLMA also possibly belong to the same local glassmaking tradition. This evidence is the first of its kind in Sub-Saharan Africa indicating primary production dated to the early second millennium AD. The identification of crucible

fragments with suspected semi-finished glass is essential for better comprehension of the production processes. Preliminary and detailed results of the analysis of the ‘semi-finished’ glass are planned for publication elsewhere. I thank the AHG for the support, which helps to add a new dimension to this research.

References

- Babalola, A.B. 2015. *Archaeological Investigations of Early Glass Production at Igbo Olokun, Ile-Ife (Nigeria)*. PhD. Dissertation Rice University, Texas.
- Babalola, A.B., McIntosh, S.K., Dussubieux, L. and Rehren, Th. 2017. ‘Ile-Ife and Igbo Olokun in the History of Glass in West Africa.’ *Antiquity* **91**(357), 732–750.
- Babalola A.B. and Rehren, Th. 2016. *The 11th–15th century AD glass crucibles from Ile-Ife, Southwest Nigeria*. Paper Presented at the 23rd Society of Africanist Archaeologist (SAFA) conference, Toulouse, France, June 26th – Aug. 2nd.
- Davison, C.C. 1972. *Glass Beads in African Archaeology: Results of Neutron Activation Analysis, Supplemented by Results of X-Ray Fluorescence Analysis* (Ph.D.). University of California, Berkeley.
- Degryse, P. (ed.) 2014. *Glass Making in the Greco-Roman World*. Leuven: Leuven University Press.

Eluyemi, O. 1987. 'The Technology of the Ife Glass Beads: Evidence from Igbo Olokun.' *Odu* **32**, 200–216.

Freestone, I.C. 2006. 'An indigenous technology? A commentary on Lankton et al. "Early primary glass production in southern Nigeria."' *Journal of African Archaeology* **4**(1), 139–141.

Freestone, I.C. 2008. 'Pliny on Roman Glassmaking.' In Martín-Torres, M. and Rehren, T. (eds.), *Archaeology, History and Science. Integrating Approaches to Ancient Materials* (UCL Institute of Archaeology Publications), Oxford, 77–100.

Freestone, I.C., Gorin-Rosen, Y. and Hughes, M.J., 2000. 'Primary glass from Israel and the production of glass in the late antiquity and the early Islamic period'. In Nenna, M.D. (ed.), *La route du verre. Ateliers primaires et secondaires de verriers du second millénaire avant J.C. au Moyen Age. Travaux de la Maison de l'Orient Méditerranéen* **33**, Lyon, 65–83.

Freestone, I.C., Greenwood, R. and Gorin-Rosen, Y. 2002. 'Byzantine and early Islamic glassmaking in the

Eastern Mediterranean: production and distribution of primary glass.' In Kordas, G. (ed.), *Proceedings of the first international conference on Hyalos-Vitrum-Glass. History, technology and conservation of glass and vitreous materials in the Hellenic World*, 1–4 April 2001, Rhodes, Greece. Athens: Glasnet Publications, 167–174.

Frobenius, L. 1913. *The Voice of Africa: Being an Account of the Travels of the German Inner African Exploration Expedition in the Years 1910–1912*. B. Blom.

Lankton, J.W., Ige, O.A. and Rehren, T. 2006. 'Early Primary Glass Production in Southern Nigeria.' *Journal of African Archaeology* **4**(1), 111–138.

Rehren, Th. 2016. 'Another Order of Glass – or How much Glass Does the Pharaoh Need?' In Franzmeier, H., Rehren, Th. and Schulz, R (eds.), *Mit archäologischen Schichten Geschichte schreiben Festschrift für Edgar B. Pusch zum 70. Geburtstag*, Forschungen in der Ramses-Stadt **10**, Gerstenberg-Verlag, Hildesheim, 255–268.

OTHER GLASS REPORTS

Reconstructions of Roman Wood-fired Furnaces

Mark Taylor

The Glassmakers

Eleven years ago the wood-fired furnaces at Quarley in Hampshire were first lit. Since then, interest in glassblowing using wood-fired furnaces with a stoke hole and sub-ground-level firing chamber, based on Roman archaeology, with a daub (a mix of clay and organic matter) superstructure containing pots, has resulted in many more furnaces appearing (and disappearing again) in various parts of the world, including Belgium, Germany, France, the USA and Australia. Here we report on the Quarley furnaces and on two furnaces in Belgium and Germany.

After having been fired for two three-week long periods in 2005 and 2006, the Quarley furnaces have been exposed to weathering for over eleven years and their deterioration recorded (www.theglassmakers.co.uk/weathering.htm).

Following initial rain damage, which swept away the outer few centimetres of the 15cm-thick furnace walls, the main agent has been freeze-thaw, aided by plant growth (mainly mosses and grasses) which stabilises the redeposited material, but appears to help to loosen the exposed areas of the walls. There has also been damage

by animals (horses, evidence of rabbits and an early episode of a cat falling through the roof of the lehr!). The furnace superstructures are still standing, but the lehr superstructure has now been reduced to several lumps covered by grass. This is because the weathering processes have had more impact on this structure, as it was only fired to just over 500°C, whereas the inner walls of the furnaces were fired to well over 1100°C. We will continue to photograph the furnaces at regular intervals.



Figure 1: Quarley furnaces October 2017. Photo © Mark Taylor and David Hill

In 2008, a five-pot furnace and a lehr were built to our designs at Velzeke in Belgium. Since then, this furnace has been fired each year for 24 hours a day, for one, sometimes two, week-long periods, and has attracted a core of four glassblowers (from the UK, France, Germany and the USA), with other glassblowers from around the world visiting occasionally. In 2017, the dome was rebuilt as the original structure was in danger of collapse.



Figure 2: Velzeke furnace September 2017. Photo © Mark Taylor and David Hill

In 2013, at the Villa Borg in Germany a three-pot furnace and a lehr based on furnace remains discovered at Trier was built by Frank Wiesenberg. This has also been run day and night for week-long periods each year, using the same core of glassblowers.



Figure 3: Villa Borg furnace June 2017. Photo © Mark Taylor and David Hill

Both sites have had an extra lehr added to cope with the large amount of glass that is made each year.

The furnace at Velzeke was primarily built to be an attraction for the public at the museum in whose grounds it stands. The Villa Borg furnace was intended as an

exercise in experimental archaeology. Both sites are very popular with visitors, and as they were built as permanent facilities, they have protective wooden structures large enough for the teams and helpers to work within.

Both sites need a team of stokers. The Velzeke furnace draws stokers from museum employees as well as volunteers from the world of ancient glass studies. The Villa Borg furnace also has volunteer stokers, but each year has around ten students from the archaeology department of a German university (a different university each year). They acquire first-hand experience of the operation of a wood-fired furnace and lehr, as well as having the opportunity to learn to blow glass. In addition, each year the students build a small bead-making furnace. These furnaces are small versions of the main furnace, with a stoke hole and small 'turret' over which the beads are made, and operate on the 'rocket stove' principle of using small amounts of wood to produce a high temperature: over 1000°C can be reached. Several students have returned as volunteers in following years.

Frank Wiesenberg has also built a second furnace at Villa Borg, which is small enough to be portable. It holds a single pot which can hold up to 2 kilos of molten glass, compared with the larger pots in the main furnace at Velzeke and Villa Borg, which each hold about 6–8 kilos: enough to blow glass for a day or more. The furnace is fired during the day and allowed to cool down at night, and the pot is easily filled with hot glass taken directly from a pot in the main furnace.

Although the Velzeke furnace has been used for a few experiments, the bulk of the experimental work is done at the Villa Borg furnace. This has included work on Roman blown mosaic glass, gold band glass, ribbed and mosaic bowls, and Roman mould-blown and window glass, as well as enabling students of the chemistry of ancient glass to perform small experimental melts as part of their studies.

These furnaces have been designed for glassblowers to work seated in front of a gathering hole, which doubles as a reheating hole, and with irons in a small pipewarming hole to their right-hand side. This is reflected in the designs on the oil lamps from the later first century CE, and is the method used by modern glassblowers in the eastern Mediterranean countries. It is an economical way of working, and intricate vessels can be made, often on one's own.

The glass used is based on ancient soda-lime glass, is commonly blue-green, and is a short glass, stiffening rapidly as it cools. This necessitates frequent short reheats, particularly if the vessel walls are very thin.

Other colours used include opaque white and yellow, copper and cobalt blues and emerald green.

Wood-fired furnaces provide a relaxed setting in which to work, giving the glassblowers freedom to make whatever they want, and having the willing assistance of other members of the team. Watching and learning from each other adds techniques to one's repertoire, sharpens one's skills, and sparks enthusiasm to learn to make vessels from different historical periods: from Hellenistic and Roman non-blown vessels to Roman, early and later Medieval, and Venetian Renaissance blown glass. One of the highlights has been a Venetian dragon-stem goblet made by William Gudenrath at Velzeke in 2013, now on display in the museum along with a wide range of other vessels made at the furnace.



Figure 4: Dragon-stem goblet by William Gudenrath. Photo © Mark Taylor and David Hill

The larger Quarley furnace consumed between ten and fifteen kilos of seasoned wood per hour, depending on the temperature required: gathering at around 1080°C and dropping to 1000°C at night to save fuel. The Velzeke furnace, being even larger, uses a little more, and the smaller Villa Borg furnace uses less. Temperatures can reach 1150°C to 1200°C if necessary.

An extension to the Villa Borg site is now being built, with the addition of another shelter to hold one large and two small furnaces and two lehrs, and is planned to be used in 2018. Separate smaller shelters will hold a wood-fired pottery kiln and metalworking facilities.

The Velzeke furnace is usually fired during the first half of September and the Villa Borg furnace during late May or early June.

For details of the Quarley furnaces, see www.theglassmakers.co.uk/archiveandlinks.htm.

For the Velzeke and Villa Borg furnaces, see www.glasrepliken.de/p_glasofenexperiment.htm.

REMINDER

Would you like to see the photos in this issue in colour?

We can send a colour PDF version of this issue of *Glass News* on request TO MEMBERS AND SUBSCRIBERS (in addition to your paper copy – we know you like something to read in the bath!).

Please email one of the editors (see back cover) if you would like a PDF copy.

A Probable Restoration English Glass Identified

Colin Brain

In the last edition of *Glass News* (GN 42), I highlighted the challenge of safeguarding 17th-century British glass for future generations. One of the actions I suggested was to try to identify any relevant glasses that are offered for sale and endeavour to safeguard these. When I wrote that, I did not anticipate how soon this strategy would pay off.



Photo © Colin Brain

The glass illustrated here was sold recently in a north of England auction as part of a lot. Given the modest hammer price for the lot, its importance clearly went largely unrecognised. It has a moulded lion-mask stem, gilded on the outside. The bowl and the foot are decorated with fragments of gold leaf sandwiched between two gathers of glass. Lion-mask stems of this general type were produced in a number of countries for about a century. However, on this one, the moulded mask was truncated at the bottom during production and replaced with a capstan-shaped joining piece. This appears to be a late form, for example a stem fragment of this configuration is illustrated by Oswald and Phillips (1949) from the excavated remains of a glass-seller's shop thought to be burnt in the 1666 fire of London. A

similar form of stem construction appears to have been specified by Glass-seller John Greene in his drawings that accompanied his early orders from Venice which started in 1667.

Careful comparison between this glass and stem fragments from other fire-of-London sites and from northern Europe, including under short-wave and long-wave UV light, suggest that this glass is of English manufacture. Its darker-than-usual amber tint may well be the result of deliberate coloration to blend in with the gilding. The only glass recipe known to the author for producing such a colour is one recorded by Gustav Jung in late 1667 or early 1668 during his visit to a glasshouse near the Tower of London.

The glass has been repaired at the top of the stem with what appears to be a period repair; with the repairer attempting to gild the repair to blend with the stem. A number of repairs of this general type have been recorded archaeologically from 17th-century English contexts. Some of these were published by Willmott (2001). No record is known of the use of similar glass-stem repairs in other countries at this time.

An artefact such as this 350-year-old glass inevitably stimulates many questions in the mind of the viewer. Who has owned it – and drunk from it? Why did the owner get it repaired instead of buying a new one? What was drunk from it? What is the significance of the gold leaf decoration on the bowl and foot? It has been suggested that these represent the earth and the heavens, but is this really the case? So far it has not proved possible to discover the glass's recent history, but now that it has been identified there is more chance that future generations will be able to muse on points such as these.

Oswald A. and Phillips H. 1949. 'A Restoration Glass Hoard from Gracechurch St., London', *The Connoisseur*, September 1949, 30–36.

Willmott, H. 2001. 'A Group of 17th-Century Glass Goblets with Restored Stems: Towards an Archaeology of Repair', *Post-Medieval Archaeology* **35**, 2001, 96–105.

NEW DISCOVERIES

Glass in the National Press: Medieval window glass from Westminster Abbey, and ‘mysterious’ post-medieval rosary beads from St Alban’s Cathedral

You may have read about these glass finds in the national press in December 2017. *The Guardian* (Maev Kennedy, 27 December) was one of the papers to have reported that while clearing the triforium of Westminster Abbey to create a museum space, Warwick Rodwell discovered some 30,000 fragments of window glass, amongst other accumulated debris that had built up over the upper sides of the abbey’s vaulted ceiling. The glass was sorted by archaeologists, and is now being conserved in the Canterbury Cathedral stained glass studio, led by Leonie Seliger. They include fragments dating back to the 13th century, including mythical animals, faces, stars and sun rays, thousands of pieces of flower-painted grisaille, and a tearful 15th-century head of the Virgin, strikingly similar to a fragment in Canterbury Cathedral. New windows are being created from the fragments, and will be installed in a tower that will be opened at Westminster Abbey; the glass will provide research opportunities for many years.

At St Alban’s Cathedral, during the excavation of a child’s grave in the churchyard, Canterbury Archaeological Trust staff discovered blue glass rosary beads wrapped around the child’s right hand, and left trailing downwards. They have been described as a ‘mystery’ as this practice suggests that the child was Catholic, in an otherwise mainly Protestant burial ground dating to around 1750 to 1850 (*bbc.co.uk* website 24 December 2017).

NEW PUBLICATIONS

The Hellenistic, Roman, and Medieval Glass from Cosa

(Supplements to the Memoirs of the American Academy in Rome)

David Frederick Grose (Author), Russell Scott (Editor)

University of Michigan Press 2017
ISBN-13 978-0-47213-062-7
ISBN-10 0-47213-062-5
Hardcover, 304 pages, English

David Frederick Grose was Professor of Classics at the University of Massachusetts, Amherst. R.T. Scott is

Doreen C. Spitzer Professor of Latin and Classical Studies at Bryn Mawr College.

The Hellenistic, Roman, and Medieval Glass from Cosa continues the exemplary record of publication by the American Academy in Rome on important classes of materials recovered in excavation from one of the principal archaeological sites of Roman Italy. Over 15,000 fragments of glass tableware, ranging in date from the mid-second century BCE to the early fifth century CE, were found at Cosa, a small town in Etruria (modern Tuscany). Cosa’s products were chiefly exported to North Africa and Europe, but its influence was felt throughout the Mediterranean world. The research and analysis presented here are the work of the late David Frederick Grose, who began this project when no other city site excavations in Italy focused on ancient glass. He confirmed that the Roman glass industry began to emerge in the Julio-Claudian era, beginning in the principate of Augustus. His study traces the evolution of manufacturing techniques from core-formed vessels to free blown glass, and it documents changes in taste and style that were characteristic of the western glass industry throughout its long history. At the time of Grose’s unexpected passing, his study was complete but not yet published. Nevertheless, the reputation of his work in this area has done much to establish the value and importance of excavating and researching Cosa’s glass. This volume, arranged and edited by R.T. Scott, makes Grose’s essential scholarship on the subject available for the first time.

BOOK REVIEWS

Glassware and Glassworking in Thessaloniki 1st Century BC – 6th Century AD

Anastassios Ch. Antonaras

Archaeopress
Roman Archaeology 27
383 pages, English
ISBN 978-1-78491-679-4
ISBN 978-1-78491-680-0 (e-pdf)

This is the very fine and thorough publication, in the words of the author, of ‘nearly all the glass vessels, both Roman and early Christian, brought to light by excavations conducted in Thessaloniki and its environs from the early 20th century until the year 2002’. It was first published in Greek in 2009, and this updated version in English acknowledges the help of the AHG towards publication costs.

In total 754 items are catalogued – in fact more because additional pieces are inserted into the system with suffixes a, b, c etc. In addition to these, mention is made of many more fragments which, for various reasons, could not be published here, so it presents a huge body of material which was hitherto unavailable to glass scholars. Every catalogued piece is illustrated by line drawings and also by colour photographs. There is a chapter on the find spots and/or excavations of all those pieces for which this is known, along with any dating evidence. This has done an admirable job of rectifying the fact that glass has been an overlooked artefact in Greece for many years – both by setting the standard and presenting the evidence so thoroughly.

The author has used the material to produce a numbered typology of 149 forms, the vast majority of which are vessels but also including lamps, stirring rods and appliqué. These are often, but not always, related to the forms of Isings 1957, reinforcing the amazing longevity of that 60-year-old classification system! However, it is a system which is immediately recognisable to everyone studying glass and, for the sake of consistency, I was unsure why some common types such as ‘ribbed bowls’ and ‘aryballoi’ are not identified by Isings’ forms. Many parallels for all these are given as footnotes, especially those from Greece, but also worldwide. From a UK-centric viewpoint, very few are related to the British ‘standard’ of Roman typology and dated finds – Price and Cottam 1998 – though many British finds are noted from the Colchester glass discussions (Cool and Price 1995).

The book goes far beyond the presentation of the material, as there are also chapters on ‘Production’, both of raw glass (primary production) and vessels (secondary production). The evidence for local secondary production workshops in Thessaloniki is presented, describing one certain and three more probable sites, including some likely products of these. A very interesting chapter on ‘Glassworkers: People, Artisans and Traders’ discusses the likely social standing and other aspects of the lives of the people working in this industry throughout the Roman world, drawing together what is known from ancient sources.

Vessel production methods are also presented, as are decorative techniques. Re-enacting ancient production methods by practical experiments is the best way of seeing how such ideas work, and there are a number of people who have done this, not always coming up with the same solutions. It is much more difficult to say a vessel *was* made like this than that it *could have been*, given the product achieved. In this context it is a shame that the work of one line of experimentation is given some certainty here (that of Rosemarie Lierke and colleagues) whereas the work of experimental glassworkers Mark Taylor and David Hill does not get a mention. I urge the author to visit their workshop and see

them in action! It is also mainly in this section that the English translation occasionally falters, with words like ‘chunkslumps’ and ‘chunkamount’ necessitating a double-take.

Finally there is a very useful glossary of glassworking terms, a concurrence between catalogue and museum accession numbers, and a typological and chronological table, showing the periods of use of all the vessel types discussed.

Overall this is an incredibly useful and all-embracing publication of an important body of material, which will be much appreciated by all those working on and interested in Roman and early Byzantine glass.

Cool, H.E.M. and Price, J. 1995. *Roman vessel glass from excavations in Colchester 1971-85*. Colchester Archaeological Report **8**.

Price, J. and Cottam, S. 1998. *Romano-British Glass Vessels: a Handbook*. Practical Handbook in Archaeology **14**, Council for British Archaeology.

Isings, C. 1957. *Roman Glass from Dated Finds*. Groningen: JB Wolters.

Denise Allen

Mapping the Indo-Pacific Beads vis-à-vis Papanaidupet

Alok Kumar Kanungo

Aryan Books International, New Delhi and International Commission on Glass, Madrid 2016
Hardback, 92 pages, English
ISBN 978-81-7305-547-8

This book captures the craft of bead production using traditional methods at Papanaidupet, Andhra Pradesh, India, before it disappears. At the time the book was written only two furnaces were still producing beads in the village, and then only as demand required, although bead production had been a thriving industry here only twenty years before when up to twenty furnaces would have been working continuously. Like the ethnographic study produced over twenty years ago by Koch and Sode (1995) on Northern Indian glass and bead making, this book provides a glimpse of an industry, its methods and history, which feeds into our understanding of modern and ancient craft glass production.

The book is not only a technical description of the bead-making process but also gives context to glass production in the area and reviews the history of bead production in India. It is set out in six chapters and a concluding summary. Chapter 1 reviews the evidence for ancient and

historic Indian glass and glass production, providing a fully referenced directory of all sites where glass production has been found and published. Maps, illustrating where evidence of glass and beads have been found within India, divided into four periods between 1200 BCE to 1800 CE, are used to support the widespread use of glass throughout India; some of these the author suggests may have been producing beads, based on references in early texts and finds of production debris and semi-finished beads (furnace remnants are rare). Chapter 2 looks more specifically at Indo-Pacific beads. These small beads in a variety of shapes, produced using the *lada* technique, seem to have been made at various centres in India and South East Asia. They have a wide distribution from Africa to Korea. The find locations of the beads are listed, and maps of those found in South East Asia, by period, are presented (updating maps originally presented by Abraham and Heather in 2010).

Chapter 3 introduces the village of Papanaidupet and describes the history of bead production in the village. Chapter 4 is the heart of the publication and, as the longest chapter details the bead production methods in use at Papanaidupet. The first part of the chapter examines the division of labour for bead and tool production, fuel collection and collecting glass for recycling. Then the structures for making glass and for producing beads, and the fuel and materials used are described (raw glass is now brought in from Firozabad and not made on site regularly, and so unfortunately raw glass production was not observed). The processes of bead production are then discussed, from glass melting to stringing the beads. This chapter is illustrated with many photographs, and the inclusion of schematic plans of the working spaces and furnaces from two bead-making companies is especially useful for understanding the workshop layout.

Chapter 5 gives descriptions and maps of the village location, the site of the workshops in relation to other structures, details of the workshop area and the houses of the glassmakers, and discusses these in the context of ancient glass production. The users/wearers of the beads are described in Chapter 6, which provides the final stage in the cycle from raw glass through bead manufacture to the people who use them, some of whom are as far away as Indonesia and the African continent. Two case studies which focus on the Bondo and Naga communities in India and on the Indian border with Myanmar respectively, are used as examples of bead use in modern day societies. The concluding chapter briefly summarises the book, and examines how the remains of bead production may be sought in the archaeological record and the potential future of bead making in this village.

This is a useful book for those interested in glass beads and also for archaeologists looking at ethnographic

examples of bead production, task distribution and bead workshop layout. The book is well illustrated with photographs, maps and plans, and provides a helpful bibliography. It is a valuable study which records aspects of an industry in Papanaidupet, India which is rapidly disappearing.

Abraham, S. and Heather, C. 2010. The Indian Ocean and the Indo-Pacific Bead: Mapping a key artefact category from the Pattanam Excavations. Poster presented at the *20th European Association for South Asian Archaeology and Art Conference*, Vienna, Austria.

Koch, J. and Sode, T. 1995. *Glass, Glass beads and Glassmakers in Northern India*. Denmark: Thot Publications.

Caroline Jackson

Contact us

Honorary Secretary: Denise Allen, 12 Birchy Barton Hill, Exeter EX1 3ET
Email: denise_allen52@hotmail.com

See the website for updated information:
www.historyofglass.co.uk

If you are not computer-connected and would like further information or to be put into contact with anyone concerning any of the items in *Glass News* please write to either of the editors, or the Honorary Secretary.

Please send your contributions:
Finds • Research • Ideas • Enquiries
Publications • Conferences • News
for *Glass News* **44**

by 1st June 2018

to either of the editors:

Andrew Meek
Department of Scientific Research
The British Museum
Great Russell Street
London
WC1B 3DG

AMeek@thebritishmuseum.ac.uk

or

Rachel Tyson
rachel@glass-vessels.co.uk