

Glass News

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Mould-blown glass from Madinat al-Zahra near Cordoba, dating to the latter half of the 10th century © Chloë Duckworth

Welcome to Glass News Issue 38!

This issue is filled to the rafters with news and articles. There are reports on Medieval glass from Spain, Roman glass from Italy and Islamic glass from Israel. News of exhibitions and gallery openings, along with plenty of upcoming glass conferences and meetings!

The autumn 2015 meeting of the AHG will be held at the London Archaeological Archive and Research Centre on the 20th of November. This year's meeting will continue the theme begun in 2013 at *A Miscellany of Glass* and will focus on current research and new finds. For more information, see page 2.

There is an important note on the AHGs finances on page 8, so please make sure you check that out.

As ever, thank you to all of our contributors for making this such a great issue. If you have any news you would like to share with the AHG community, please send it to the editors (details on page 16). We look forward to receiving your contributions for issue 39!

TWITTER

The Association now has a Twitter profile! To keep up-to-date on news and current research on the history of glass follow: @Ass_Hist_Glass

FACEBOOK

The Association has a Facebook page! 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.

REMINDER

MEMBERS AND SUBSCRIBERS ONLY. Would you like to enjoy all the wonderful Glass News pictures in colour? If so, please email one of the editors (see back page) and we will also email future issues of Glass News to you as a full colour PDF!

THE ASSOCIATION FOR THE HISTORY OF GLASS

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AHG MEETING AND AGM

Fragmentary Tales

A second miscellany of glass

Friday 20 November 2015

London Archaeological Archive and Research
Centre, Eagle Wharf Road, London N1 7ED

Please join us for a day of presentations and discussion about current research and new finds and developments in the work of ancient and historic glass. We are using this study day to highlight exciting new discoveries and to explore recent research into glass; all of which are yet to be published. Presentations will include material from new excavations and research including Kirkstall Abbey (Yorkshire), Tanner Street and Abacus House (London) and Bedford Roman villa. In the later afternoon there will be an opportunity to look at material brought along by delegates and speakers, and ask questions.



Roman gladiator cup © Caroline Jackson

We already have presenters who have kindly offered to share their new finds with us, but if you would like to give a short presentation or bring along any finds or photographs, please do contact Caroline Jackson via email at: c.m.jackson@sheffield.ac.uk

This study day has been designed to appeal to all those with an interest in ancient and historic glass and to highlight the role of the Association for the History of Glass as a network for dialogue on all aspects of the subject.

If you would like to attend, please send your full contact details and a cheque for £24 (members of AHG), £34 (non-members) or £12 (students) payable to the Association for the History of Glass Ltd to: Denise Allen, 8 St Catherine's Road, Southampton SO18 1LJ, UK. Lunch is not provided, but is available locally.

Members wishing to attend the AGM of the Association only, which will be held on the same day, may do so free of charge.

OTHER MEETINGS



30th meeting of AFAV

Berck-sur-Mer, France

2-4 October 2015

The next meeting of l'Association Française pour l'Archéologie du Verre (AFAV) will be held in Berck-sur-Mer (Pas de Calais) on the 2nd to 4th of October 2015.

The first day of this meeting will be focussed on the glass of the north of France. The next two days provide the opportunity to discuss glass from other areas of France, and elsewhere.

The call for papers is now closed. For more information and to register for this meeting, visit the AFAV website: www.afaverre.fr/Afaverre/rencontres/

ICOM-CC Glass and Ceramics Working Group Interim Meeting Recent Advances in Glass and Ceramics

Conservation

25-29 May 2016

Wrocław, Poland



Regional Alliance for South East Europe - ICOM SEE

Background

Conservation is becoming increasingly more international and interdisciplinary. Conservators, curators, and scientists are aware of the importance of sharing knowledge and the value of discussing advanced research to improve conservation practice. Following a sequence of successful meetings, including Nova Gorica (2007), Corning (2010), and Amsterdam (2013), the next interim meeting of the ICOM-CC Glass and Ceramics Working Group will be organised in Wrocław, Poland.

Aims of the conference

- to present relevant case studies in the conservation of glass and ceramics
- to disseminate research results in the field of cultural heritage
- to promote the application of new materials and technologies for conservation practice as well as tools for analysis and documentation
- to identify further research and to provide networking for future activities

Target audience

- conservators working in museums and in private practice
- scientists specialising in conservation
- students interested in glass and ceramics
- curators and administrators in charge of museum collections or cultural heritage sites

Structure and scope

The three-day conference will include thematic sessions on research in progress and case studies related to glass and ceramics conservation and scientific investigation. A limited number of posters will be displayed. Several post-conference tours will be offered to allow participants to explore glass making as well as museum collections in Poland. Following the format of the previous meeting in Amsterdam, a Student Forum will follow or precede the conference.

Language

The conference language will be English.

For more information, please visit:

http://www.asp.wroc.pl/ICOM_ASP/

Technical Knowledge in Europe: From Written Texts to Archaeological Evidence (13th – 16th centuries)

University of Cordoba, Spain
17-19 September 2016

This meeting will review the key historiographical subjects regarding artistic and industrial technology in the Late Middle Ages and the first century of the Modern Period. One of the meeting's core targets is to highlight the variety of methods with which the issue can be approached, from the study of the written record to archaeological investigation; and from the examination of technical recipes to the scientific analysis of works of art and archaeological materials.

The meeting has been organised within the framework of research project Plan Nacional HAR2012-37357 (*El conocimiento científico y técnico en la Península Ibérica*

(siglos XIII-XVI): producción, difusión y aplicaciones), funded by the Spanish Ministry of Economy, and will gather together in Cordoba some of the foremost European specialists on the subject.

The Organising Committee is open to the presentation of papers, which must relate to one of the following four key topics:

- Industrial and artistic technologies in various fields (textile, leather, metal, milling, glass...)
- Recipes and other sources for the study of crafts and artistic technologies (localisation, edition, content...)
- Scientific analysis of artistic and archaeological items
- Experimental reproduction of historical technical recipes

For more information and to register for this meeting, please visit the official website:

<http://www.tke2015.es/>

Final reminders!

20th Congress of the International Association for the History of Glass

7-11 September 2015

Fribourg and Romont, Switzerland



The 20th Congress of the AIHV will be organised by the Vitrocentre and Vitromusée Romont in cooperation with the University of Fribourg. Three parallel sessions of lectures are planned, along with poster presentations. The programme leaves time for sightseeing, and participants will also have the opportunity of visiting exhibitions, specially organised for the congress, in museums in Fribourg and in Romont. Further information and the preliminary programme can be found on the official website:

<http://www.aihv2015.ch/en>

Society of Glass Technology

Glass Reflections: Glass in the Year of Light

7-9 September 2015

Cambridge, UK

The 2015 SGT conference will celebrate the fundamental interactions of glass with light – from novel glass telecommunication fibres and technologies through

windows and artistic applications to the use of high intensity light to probe the very structure of glass. The conference will have two synchronised parallel sessions. Research in Glass Science and in its application to the production and application of glass in the modern world forms one of the conference streams. The other stream will focus on the History and Heritage aspects of this material which has captured our imagination, spanning science and art, archaeology and conservation, museology and the importance of raising the public profile of historic glass artefacts. To register for the conference, please visit the official website:

<http://www.glassreflections.sgt.org/>

MEETING REVIEW

Things that travelled – Mediterranean Glass in the First Millennium AD

28-29 November 2014

Wallace Collection, University College London and
The British Museum



The conference jointly held by UCL's EGTRN (Early Glass Technology Research Network) and the AHG, covered the huge expanse of time and geography that Mediterranean glass travelled. It was well attended with over 100 delegates and 25 papers ranging from primary glass workshops in Egypt, to scientific studies of Mediterranean glass in Libya, Bulgaria, and beyond the frontier of Roman Britain.



Pre conference handling session at the British Museum
© Sophie Wolf

We began the first day in London's beautiful Wallace Collection, with Peter Cosyns looking at both trade patterns, and the relationship between composition and form in Late Antique Cyprus, to postulate the existence of Cypriot primary workshops. Staying in Cyprus, Andrea Ceglia presented his team's scientific study of glass at the church sites of Maroni, Kalavastos and Yeroskipou, showing shifting proportions of Levantine vs Egyptian glass at different sites. Moving north to Bulgaria, Anastasia Cholakova demonstrated, amongst the 5th- to 6th-century Levantine glass, an indigenous Bulgarian production of an attractive blue rimmed glass. Back to the Mediterranean, Kalliopi Nikita presented a survey of the luxury glass excavated at Eleutherna-Sector I, Crete. The final talk for the first morning was Anastasios Antonaras' fascinating presentation on Oversize Glass Gem Insets, predominantly from ancient Macedonia, raising many questions about their use and distribution.

After lunch, talks resumed at a gallop with a summary of Patrick Degryse's extensive isotopic work on glass, soon to be published as a volume *Glass Making in the Greco-Roman World*. Of 400 samples, across the empire, Patrick's work implies 65% were Syro-Palestinian, the main glass production region of the Roman world, however, a significant proportion appears to be from as yet unknown primary production sites, potentially from Italy, North Africa and the Western Mediterranean. Ruth Jackson-Tal showed trade and usage of Roman glass within Nabatean sites travelled along prominent trading routes, while at the other side of the Roman world, Mary Davis demonstrated the presence of Roman glass in early first century sites in Inverness. Yael Gorin-Rosen's survey of several decades of work on the location and nature of primary and secondary glass production in Israel was extremely comprehensive, moving towards answering old questions and raising new ones. Matt Phelps continued the Levantine theme with his and colleagues' incredibly interesting glass from Ramla. His analyses show a dominance of Egyptian glass, despite the Levantine locale. Susan Walker then introduced her and Andrew Shortland's work on the gold-glass in the Wilshire Collection, with three main compositional groups according to decolourants, expressing a chronology in which recycling becomes an important group.

After a brief recess and change of venue, the first talk at UCL was given by Ian Freestone, on the increasingly illusive 'HIMT' glass. The theme of HIMT glass dominated the scientific papers, and Freestone discussed the variety of production and the idea of market forces as potentially the driver of this new glass' success, highlighting that there are economic reasons why both producers and consumers would choose HIMT. Next Chloë Duckworth spoke on her and David Mattingly's

latest work on the glass from the Garamantes site of Jarma in the Libyan Sahara, showing a huge amount of Roman first to second century large jars and plates, before a shift in the third century to Egyptian exotica. The final talk of the first day was Margaret O’Hea, on an apparent glass furnace, built in the fashion of a tannour (a type of Middle Eastern bread oven), which prompted lively debate.

The second day began with three talks on glass excavated from Northern Adriatic Italian sites, notably Aquileia. Marcante charted the typo-chronology, showing a different deposition in the living site to the necropolis, and that, using glass as a proxy, the AD 452 raids had no apparent economic impact. Sarah Maltoni et al. and Filomena Gallo et al. both discussed the composition of glasses from the region, with particular emphasis on the relationship between base glass composition and colour, i.e. 3 HIT blue glasses.

Jim Peake’s Anglo-Saxon beads also highlighted our increasing problem of terminology of glass types and forms, but was a fascinating scientific study on imported and recycled glass in East Anglia after the Romans. The topic of recycling was continued by Margherita Ferri and colleagues, with the recycling of tesserae at Comacchio (late 7th century). Line Van Wersch and colleagues presented a hugely valuable dataset of Merovingian and Carolingian church window glass, whose compositions also implied potentially recycled Roman glass. St John Simpson then took us back to the Eastern reaches, to the Sassanid empire, and the importation of glass blanks for cut glass vessels and the links between glass and metal objects.

Marie-Dominique Nenna gave an absolutely fantastic keynote talk, charting the history of glass production in Egypt, with particular attention paid to the evidence from the excavations at Wadi Natron. While the analysis of the material unfortunately didn’t lead to a provenance for HIMT glass, the exposure of a near complete furnace allows a detailed reconstruction of primary glass making. Daniela Rosenow and Thilo Rehren’s work on Roman and Late Antique glass from the Upper Egyptian site of Armant filled in much of our understanding of glass in Egypt both into this later period, and further south, potentially giving us further information on where HIMT, HIT and weak HIMT glass are coming from.

Next the differential use of green glass was explored by Sally Cottam, in collaboration with Caroline Jackson, who had observed that an emerald green colour, while available at a huge number of workshops, was restricted to a small number of vessel forms, indicating the choice seems to not be one of material availability. Our last talk was on several analyses of red opaque glasses, by Monica Ganio and colleagues, whose close chemical composition

led the authors to conclude red opaque glass might have a single production centre.

The problem of terminology, particularly in terms of ‘HIMT’ glass, became a clear focus of the conference, with many speakers suggesting abandoning the term, and the attendant ‘HIT’ and ‘weak HIMT’ altogether. Whatever the case, it is clear that we no longer expect these glasses to have a single origin, or represent a single production, as this incredible productive conference shown. UCL’s EGTRN and the AHG, as well as all the speakers and poster presenters (too numerous to summarize), must be commended on a fantastic two days and an incredibly successful conference.

Victoria Sainsbury

EXHIBITIONS

The Waddesdon Bequest

The British Museum, London

Now open

Admission free

The Waddesdon Bequest, the superb collection of medieval and Renaissance treasures left to the British Museum in 1898 by Baron Ferdinand de Rothschild MP, has been redisplayed in a new gallery.

The new display will contain some of the most impressive objects in the British Museum’s European collection, and will give fascinating historical insight into shifts in taste, the growth of the art market, and the development of forgery in response to demand from collectors in the nineteenth century. In addition, the redisplay will involve the most ambitious digital treatment of a permanent gallery by the Museum.

As a demonstration of power and discernment, the collection tells the story of the rise of the Rothschilds as a new European aristocracy in the 19th century. Until Baron Ferdinand’s death in 1898, it was displayed in a specially-created room, The New Smoking Room, at his country retreat, Waddesdon Manor in Buckinghamshire, a National Trust house managed by the Rothschild Foundation. With this new gallery, which reconnects the Waddesdon Bequest both with Waddesdon Manor and with the history of the British Museum, the collection can be fully understood for the first time in its proper intellectual and historical context.



*A case in the Waddesdon Bequest gallery (Room 2a)
© The Trustees of the British Museum*

Treasures in the Bequest range from precious amber and rock crystal, curiosities formed from exotic shells, nuts, ostrich eggs and a “griffin claw”, microcarvings in boxwood and masterpieces of glass, ceramic, goldsmiths’ work and Limoges enamel.

www.britishmuseum.org/explore/galleries/themes/room_2a_waddesdon_bequest.aspx

Fen Landscapes in Glass: An exhibition of fused glass by Althea Braithwaite

The Stained Glass Museum, Ely
8 June-31 July 2015
Admission free

To celebrate the Ouse Washes Landscape Partnership’s (OWLP) OuseFest, taking place 20 July – 2 August 2015, The Stained Glass Museum will host a small exhibition of Fen landscapes in glass by local glass artist and illustrator Althea Braithwaite. The Fenland landscape has provided much inspiration for local artist Althea Braithwaite, who says “I have always been fascinated by the beautifully coloured shadows which light makes as it shines through glass and the wide land and skies of the fens make excellent subjects for pictures in glass.”



New Contemporary Art and Design Wing Corning Museum of Glass, USA Now open

On March 20, The Corning Museum of Glass opened the doors of its new Contemporary Art and Design Wing, the largest space in the world devoted to the display and creation of contemporary art and design in glass. The \$64-million expansion, fully funded by Corning Incorporated, features a 100,000-square-foot addition, which includes a 26,000-square-foot gallery space and a 500-seat live glass demonstration facility. The new wing provides an unprecedented opportunity for visitors to see the breadth and depth of creativity by artists who have pushed the boundaries of glass as an artistic material during the past 25 years.



*New gallery in the Contemporary Art and Design Wing ©
Corning Museum of Glass*

The building’s five galleries of varying sizes contain diverse works, which are thematically curated, and the display also extends into the porch – a space that wraps around the entirety of the galleries. Works on view include many never-before-seen pieces from the Museum’s permanent collection, including large-scale sculptures, installations, glass “paintings,” and vessels. Artists who are well-known for their work in glass are on display, such as Dale Chihuly, Roni Horn, Karen LaMonte, Josiah McElheny, Beth Lipman, Liza Lou, and Klaus Moje, as are artists less known for their work in glass like Robert Rauschenberg, Tony Cragg, and Kiki Smith. A gallery entirely devoted to design in glass from the past 25 years features works by internationally recognized artists and designers James Carpenter, Christophe Côme, Dan Dailey, Studio Job, Tejo Remy, and Stephen Burks.

Glasstress Gotika

9 May-22 November 2015

Istituto Veneto di Scienze, Lettere ed Arti, Venice
and Fondazione Berengo, Murano

Glasstress Gotika, a joint project of the State Hermitage Museum in St Petersburg, Russia and Berengo Studio, Venice, Italy, is a collateral event of the 56th Venice Biennale. Curated by Dr. Dimitri Ozerkov, director of Hermitage 20 / 21 Project for Contemporary Art and of the Contemporary Art Department in the State Hermitage Museum and Adriano Berengo of Berengo Studio, Glasstress Gotika is an exploration of the effect that Gothic and medieval ideas have had on the modern conscience and contemporary art. The exhibition combines historical medieval glass and objects from the Hermitage's collection that have rarely, if ever, been seen by the public and contemporary art works created in glass by internationally renowned artists who were invited by the curators to work with the glass masters in the furnaces of Murano. The artists, who are from over 20 countries, were asked to respond to the gothic concept in their creations in glass. Glasstress Gotika will be exhibited at the historic Palazzo Franchetti on the Grand Canal and in an old glass furnace in Murano, home of the permanent exhibition space of the Fondazione Berengo.



© Fondazione Berengo

Glasstress will also present "Life Bank", a site-specific project by Belgian artist Koen Vanmechelen, who in collaboration with the Slow Food Movement will transform the old Banca di Venezia at the top floor of the Palazzo Franchetti into a "Gothic garden" dedicated to bio-diversity with a monumental installation featuring ancient seeds and interactive, multi-sensory spaces. GLASSTRESS will feature over 50 renowned artists from all over the world who have created works with the maestros of Murano, many working in glass for the first time. In 2016, Glasstress Gotika will be presented in the State Hermitage Museum in St Petersburg in the company of Russia's greatest treasures in glass.

<http://www.glasstress.org/home>

NEWS

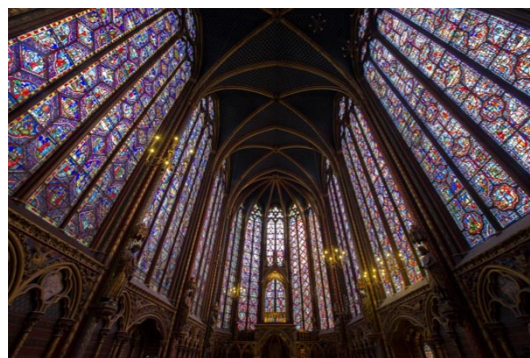
Favourite glass websites: Roman

There is so much out there on the internet, perhaps too much, of variable content and constantly changing. We'd like you to send us your favourite websites: which do you find most useful? Which museums have the most informative online catalogues? Have you come across any obscure gems? Which publications can be downloaded (free)?

Please send your suggestions to either of the editors and we'll include them in the next issue of Glass News. We will cover a different period or topic in each issue; starting with glass of the Roman Empire in the 1st/2nd century AD.

Restoration of the stained glass windows of Saint-Chapelle, Paris

A major restoration campaign of the stained glass windows Sainte-Chapelle by the Centre des Monuments Nationaux (CMN) has recently been completed. The restoration was finished to mark the 800th anniversary of the birth of King Louis IX, who commissioned the chapel.

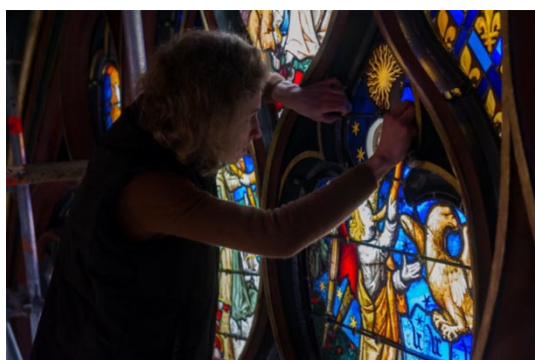


*The interior of the Sainte-Chapelle © Didier Plowy -
Centre des monuments nationaux*

A masterpiece of Gothic architecture, the Sainte-Chapelle was built between 1242 and 1248 by King Louis IX in the heart of the palace of the City to house relics of the Passion of Christ, including the Crown of Thorns. Its stained glass windows form a unique ensemble that consists of 1113 figurative scenes.

The restoration work took seven years to complete and involved dismantling the huge windows into small panels and cleaning them using manual conservation techniques and laser cleaning. In an attempt to protect the windows

from future deterioration a “skin” of glass has been moulded on to the original windows.



Replacing part of the rose © Didier Plowy -
Centre des monuments nationaux

Lottery-funded shelter for Rosedale’s Elizabethan glass furnace

The 16th-century glass furnace from Rosedale in North Yorkshire has been given a new lease of life at Ryedale Folk Museum with a new shelter. The furnace was excavated in the 1960s, and later dismantled and rebuilt at the Folk Museum. Following the collapse of the shelter a few years ago in storms, the Heritage Lottery Fund and the Rainford Trust have now funded a new oak-framed building with thatched roof to protect it, perhaps similar to its original shelter. The glassmakers are thought to have been French Huguenots. Glass fragments excavated with the furnace show that a variety of vessel types were made there, including decorated drinking vessels, and although greenish in colour, were more durable and clearer than much contemporary forest glass (see *Post-Medieval Archaeology* 6, 1972). It is the quality of the glass that has led to the furnace’s publicity as having produced ‘bootlegged’ and ‘black-market’ glass, contravening London glassmaker Verzelini’s monopoly on (*façon de Venise*) drinking glasses at the time. The furnace, and the story behind it, has received recent attention on BBC One’s *Secret Britain*, and other news articles (e.g. *Current Archaeology* 304, July 2015; <http://www.yorkpress.co.uk/features/features/12882815>. [Glass fragments throw light on Rosedale’s dark history](http://www.yorkpress.co.uk/features/features/12882815)). For information on the museum and furnace visit: www.ryedalefolkmuseum.co.uk.

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. See also the AHG website for details (www.historyofglass.org.uk).

An application form may be downloaded from the website, or can be obtained from the Honorary Secretary, Denise Allen. Email: denise_allen52@hotmail.com

AHG FINANCES

At AHG board meetings we always discuss finances. As many of you will know it has been Board policy to finance AHG grants from our capital reserves and the interest that we receive on these reserves. Low interest rates have meant that most of the money for recent grants has come from our reserves. We have now reached the point where it would be prudent not to reduce our reserves much further. This basically leaves us with two unpalatable choices: to spend less by reducing the grants we give, or to raise more by putting up subscriptions. In practice I think we will need to combine these options in some way, perhaps by making the rules for grants a little tighter and by raising subscriptions. One reason for writing this is to alert you that the Board will probably make a proposal about raising subscriptions for discussion at the AGM in the autumn.

The other reason for writing is to seek your views on what should be in this proposal. It largely comes down to subscription rates. We currently charge significantly less than the other glass-history groups, but the board is reluctant to see a large increase in subscription rates because we don’t want to exclude students and others on lower incomes. The board has considered a number of options, for example raising the normal subscription to £15 per year, but having a reduced rate of, say, £13 for those who are content to receive their copies of Glass News electronically. This option was preferred to that of having a full rate and a student rate, since it was felt that many students would prefer electronic Glass News anyway. Introducing Gift Aid has been discussed at some length, but it seems doubtful that the AHG with its current arrangements would qualify. So taking this route would not be simple and could also involve significant changes, such as the reduction in member discounts for study days. What do you think? You can email me on ahgstudydays@gmail.com or write to the Hon Secretary.

Colin Brain,
President AHG

AHG Grant Report

Medieval glass furnaces in southern Spain

Chloë N. Duckworth and David J. Govantes Edwards

School of Archaeology and Ancient History, University of Leicester
cd227@leicester.ac.uk

Introduction

The work presented was undertaken for an AHG small grant awarded in 2013. It was intended to provide a first understanding of the archaeological remains of glass production activities in medieval southern Spain. Extensive recent commercial (rescue) excavation, undertaken due to increased building work in Spain in the late 1990s and early 2000s, has revealed many instances of glass production remains. Until now, however, nobody has attempted a systematic survey and catalogue of these. Thanks to this grant we have been able to physically examine examples of furnaces and production remains where extant, and to speak with excavators or access unpublished excavation reports in other cases.

The investigation undertaken as part of the AHG grant also enabled us to take some samples of material for chemical analysis, and to make applications for further sampling. A sample has already been examined using electron microprobe analysis (with the collaboration of Edward Faber, University of Nottingham). The sampling was facilitated by the AHG grant; analysis itself was funded by a separate grant from *Fundación Málaga*. Our first results are presented below. The work of the project has also been reported in the local press in southern Spain, and has led to ongoing collaboration with the *Museo del Vidrio y Cristal de Málaga* (The Malaga Glass Museum).

As any reader of this brief catalogue will appreciate, in spite of our efforts the state of our knowledge remains far from extensive and, for various reasons, the function of most of the high temperature remains which have been suggested as relating to glass production cannot be precisely determined. For this reason our future plan is to pursue increased collaboration with the excavators themselves, and we are now in the process of organising a series of workshops designed to raise awareness of the different types of glass production remains and how they may be recognised, as well as to open up channels of communication between excavators and our own research group. This is particularly important as there remain many excavations which have not yet been published, even in the grey literature. These channels of communication have already been significantly developed thanks to the contacts we have established during the course of the work funded by the AHG grant.

Catalogue of medieval glass furnaces in southern Spain

To date, different excavations have resulted in the discovery of thirteen possible locations of glass production remains dated to between the 8th and 15th centuries in southern Spain (current regions of Andalusia and Murcia). Most of these furnaces were found in the course of rescue excavations, and have been destroyed or are not otherwise available to be visited. They are reviewed in the following catalogue.



Figure 1. Photograph of remains of structure identified by the excavators as a glass furnace at Pechina, Almería. Length of portion shown: c. 1.4 m © Chloë Duckworth

- **Bayyana (Pechina, Almería):** This furnace was excavated in the 1980s in the course of a research-led excavation. It was found in connection with ceramic production, domestic and even human remains. It was dated on the basis of the ceramics to the 8th and 9th centuries AD. The ‘glass slags’ and other production remains mentioned in the excavation report could not be examined, as their location in the relevant museums seems to be problematic. The visual inspection of the furnace remains *in situ* did not reveal whether the assessment of the remains as corresponding to a glass workshop are correct. The site is in a semi-abandoned state (see Figure 1), and the visit was not as clarifying as had been expected. This is unfortunate indeed given the early dating of the site and the peculiar position of Bayyana as a semi-independent, mercantile community

with strong connections to other Mediterranean contexts. The furnace is rectangular in shape, with a central circular area fed by two flues, 2 m long and 1.2 m wide. The remains are preserved to an approximate height of 0.2 m.

- **Sevilla (c/Matahacas)**: This urban site was found in the course of a rescue excavation and destroyed thereafter. It was dated to the 10th-12th centuries AD. The excavators reported the furnace as one for 'glass making or glass working', without further precision being possible. This was confirmed in a personal interview with the director of the excavation (Miguel Ángel Tabales). No production remains were preserved for sampling. The furnace was circular in shape, but the report does not specify dimensions. The furnace is not included in any section drawings.

- **Córdoba (Cercadilla)**: Workshop in a suburban site found in the course of systematic excavation and destroyed thereafter. It was dated to the 8th-10th centuries AD. The information contained in the excavation report is very succinct, and little more than its small size (suggesting its use for 'glass working') is mentioned. Images not available. No record exists regarding preservation of production remains, and the form and dimensions of the furnace are unknown.

- **Córdoba (Av. Corregidor)**: Workshop in suburban site found in the course of rescue excavation and destroyed thereafter. It was dated to the 10th-11th centuries AD. The excavation report is succinct, and little more than 'use for the production of glass or glazing' is mentioned. Images are not available. Production remains were preserved, however, and we have applied for permission to sample and analyse these. The form and dimensions of the furnace are unknown.

- **Córdoba (Polígono Poniente PB1)**: Workshop in suburban site found in the course of rescue excavation and destroyed thereafter. The excavation report is imprecise about the chronology and is equally unhelpful in other matters; it merely mentions that the furnace was of small size and that it could have been used for metal or glass working, and that the latter possibility is more likely. Images not available. No record exists regarding the preservation of production remains, but this seems unlikely. The form and dimensions of the furnace are unknown.

- **Córdoba (c/Gitanos)**: Workshop in an urban site found in the course of rescue excavation. Dated to the 8th-10th centuries. The excavation report is imprecise, but the dimensions of the furnace could be suitable for primary production, although the presence of a crucible may indicate otherwise. Lead remains were also found in

association with the furnace. The furnace was removed and is currently undergoing restoration before relocation in its original place. A crucible and other production remains are available for sampling and we have permission to access them at a later date. The furnace is circular in shape, and has an external diameter of just under 1 m. Internal diameter is 50-60 cm (no more details are available in the excavation report).

- **Málaga (UE-14)**: Workshop in urban site found in the course of rescue excavation and destroyed thereafter. Dated to the 11th century. The remains are rather scant, consisting of two holes excavated into the ground with a channel between them. No production remains were found, other than 'slags', as confirmed by the director of the excavation in personal interview. The dimensions of the structures are unknown.

- **Málaga (c/Cerrojo)**: Workshop in urban site found in the course of rescue excavation. Dated to the 13th century. The remains are of relatively large dimension, and for this reason the workshop may be considered a candidate for primary production, as confirmed by the director of the excavation in personal interview. Production remains have been sampled and were chemically analysed by electron microprobe analysis at the University of Nottingham (a brief presentation of first results is given at the end of this report). More production remains will be available for sampling in the future. We could not personally inspect the remains as their preservation is currently under discussion, resulting in a legal controversy between several public agencies. Although one of the ends of the furnace has apparently been lost, it can be inferred that the general shape of the plan was sub-rectangular, with an apsidal end separated from the rest of the structure by a low wall. The extant structures are over 1.5 m in length and just under 1 m in width.

- **Jaén (c/Fernando IV-c/Hornos)**: Workshop in urban site found in the course of rescue excavation and destroyed thereafter. Dated to the 13th century. According to the excavation report, the remains corresponded to a small glass furnace. Mention of other, larger, furnaces, is also made, but their use is not specified. No images are available. The furnace was found in association with a large number of vessel glass fragments, which we hope to be able to sample and analyse in future. The form and dimensions of the furnace are unknown.

- **Granada (c/Horno del Vidrio)**: Workshop in urban site found in the course of rescue excavation and destroyed thereafter. Dated to the 15th-16th centuries AD. No actual remains of the furnace were found, but a large amount of evidence pointing to glass primary

production was attested, including soil stains indicative of high-temperature activity, as confirmed in personal interview with the director of the excavation. The production remains include evidence of several stages of primary production and frits, and a large number of finished glass remains of three different styles: Nasrid; Castril (early modern); and Venetian. Samples of these remains will be chemically analysed by this project once permits and funding can be obtained. The name of the street ('Glass Furnace Street') also supports this general assessment!

- **Murcia (c/ Puxmarina):** Workshop with five extant furnaces and remains suggestive that there were originally more. Dated to the 12th century AD. This site has been well published in both Spanish and English, and material from the site has been chemically analysed and published (see list of publications below). The excavators suggest that the site may have been the location of primary glass production. We have had some reservations about this, particularly given its location in the centre of a medina, close to a market. We are currently awaiting samples of material identified as production remains from the site, and hope that their examination may help to clarify the issue. Furnace 1 (*Horno 1*) shows two main construction phases. In the earliest, the furnace was oval in shape, and had a preserved length of over 2 m and a maximum width of just over 1 m. The central pit had a breadth of 0.45 m. In the second phase, the furnace was completely rebuilt. It was circular in shape, with an external diameter of 1.2 m and an internal diameter of 0.8 m. Access to the central pit was through a rectangular opening 0.55 m wide. Furnace 2 (*Horno 2*) was rectangular in shape. It was 1.6 m long and 1.4 m wide. Furnace 3 (*Horno 3*) was badly preserved but also had a rectangular shape. The preserved length was 1.02 m and width was 0.40 m. Furnace 4 (*Horno 4*) was only partially preserved, but had a rectangular, apsidal plan. It was 2.5 m long and 1.3 m wide. The central pit was 0.5 m in breadth. Furnace 5 (*Horno 5*) was different from the rest. It was circular in plan and had a diameter of 0.9 m. It was divided into two chambers, one of top of the other, separated by a brick grille.

- **Murcia (plaza de Belluga):** This furnace was found near the above workshop. It also has a similar chronology. It is similar in structure to Furnace 4 in Puxmarina. A slab of glass was found inside the central pit. This is available for sampling, and steps are being taken accordingly for future analysis. The excavators reported the furnace as one used for primary production. It is rectangular in shape, and is surrounded by a horseshoe-shaped siege. Overall, the structure is around 4 m long and 2.4 m wide. The central pit is approximately 0.5 m wide.

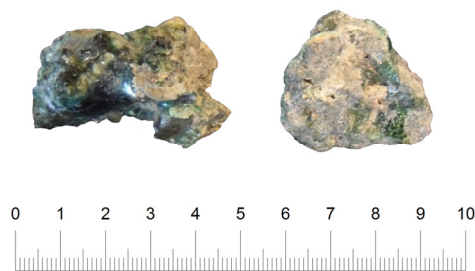


Figure 2. Left: sampled chunk of raw or recycled green glass from furnace in calle Cerrojo, Málaga
© Chloë Duckworth

Chemical analysis

We are currently able to report on the results chemical analysis of a chunk of raw or recycled green glass from close to the wall of the furnace in calle Cerrojo, Málaga. The analytical results reveal a plant ash glass with exceptionally high alumina (9.59 % Al_2O_3) and rather high iron (3.00 % Fe_2O_3) (Table 1). This could have been the intended composition of the glass, or – given its reported proximity to the furnace wall – the glass may have been contaminated during production, in which case its unusual composition could be the reason for its discard. Full publication of these results and their contextualisation with those for contemporary finished glasses and glazed ceramics from Málaga is currently in preparation.

Relevant publications in English

Carmona, N., Angeles Villegas, M., Jimenez, P., Navarro, J. and Garcia-Heras, M. 2009. 'Islamic glasses from al-Andalus: characterisation of materials from a Murcian workshop (12th century AD, Spain)'. *Journal of Cultural Heritage* 10: 439-45.

Córdoba, R. 2014. 'Technology, craft and industry'. In M. Valor and A. Gutiérrez (eds) *The Archaeology of Medieval Spain 1100-1500*. Sheffield: Equinox. pp.100-116.

Duckworth, C.N., Córdoba de la Llave, R., Faber, E.W., Govantes Edwards, D.J. and Henderson, J. 2015. 'Electron microprobe analysis of 9th-12th century Islamic glass from Córdoba, Spain'. *Archaeometry* 57 (1): 27-50.

Frothingham, A.W. (1963) *Spanish Glass*. London: Faber and Faber.

[This book makes many useful citations of historical references to furnaces of the 15th century and later, particularly in Catalonia.]

Glick, T.F. (1979) *Islamic and Christian Spain in the Early Middle Ages*. Princeton, NJ: Princeton University Press. [Includes a brief section on glass.]

Table 1. Results of electron microprobe analysis of sample of glass from the furnace excavated in calle Cerrojo, Málaga. Results are average of three spot analyses. Analysis conducted in collaboration with Edward Faber at the Microanalysis Research Facility, University of Nottingham. <mdl = below minimum detection limits of equipment used.

Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	SO ₃	Cl	K ₂ O	CaO	TiO ₂	V ₂ O ₅	Cr ₂ O ₃	MnO	FeO
10.75	1.84	9.59	58.30	0.41	0.20	0.25	5.01	4.66	0.41	0.04	<mdl	0.24	3.00
CoO	NiO	CuO	ZnO	As ₂ O ₅	SrO	ZrO ₂	Ag ₂ O	SnO ₂	Sb ₂ O ₅	BaO	PbO	Total	
<mdl	<mdl	1.43	<mdl	<mdl	<mdl	0.03	<mdl	0.46	<mdl	<mdl	1.74	98.34	

A mosaic of colours. Comparing production technologies of Roman and late-Roman glass *tesserae* from various sites of north-eastern Italy

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The present contribution is the second of two papers reporting the scientific results presented at ISA 2014 conference thanks to the support of AHG.



Figure 1: Map of relevant sites © Google Earth

In order to investigate and compare different production technologies employed in the manufacture of Roman and late-Roman mosaic *tesserae* from north-eastern Italy, three assemblages, and a total of 98 glass *tesserae*, were studied. The first assemblage comes from Aquileia, a very important north Adriatic harbour of Roman and Late-Antique times (Figure 1); in particular, the *tesserae* come from the *in-situ* mosaic of the “*Domus delle Bestie Ferite*” (House of the Wounded Animals), which derives its name from the extraordinary hunting scene represented on the floor mosaic. This mosaic is dated to the second half of the 4th century AD on the basis of stratigraphic evidence (Buono *et al.* 2012).

The second assemblage comes from Pordenone, a small city located in the inland of north-eastern Italy (Figure 1); the villa of Torre, from which the samples derive, was excavated for the first time in the 1950s by the owner of the area, the Earl of Ragogna, who was an enthusiastic

self-taught archaeologist (Conte *et al.* 1999). The high quality of the wall paintings, sculptures and the very large quantity of glass mosaic *tesserae* recovered are signs of the high status of the villa dated between the 1st and the 5th century AD; in lack of stratigraphic data, the *tesserae*, all found in secondary sites, are dated to the same time span.

The last assemblage comes from Trento, a city located in the extreme north of inner Italy (Figure 1). The *tesserae* were excavated below the current cathedral of Santa Maria Maggiore, which was built on the remains of a Paleo-Christian *basilica* (4th century AD) and of pre-existing Roman baths (1st-3rd century AD). The *tesserae*, probably derived from a disrupted decoration of the Roman buildings, were in a secondary site re-employed to fill one of the tanks of the bath. On the basis of stratigraphic data and documentary evidence the *tesserae* are dated to the 2nd-4th century AD (Gualetti 2011).

Ninety-eight glass mosaic *tesserae*, representative of all the chromatic categories and textural features represented in the three assemblages, were selected and analysed by means of a multi-methodological approach.

The complex structure of glass *tesserae*, generally composed of a glassy matrix and crystalline phases, required in fact a various set of analytical techniques in order to guarantee a complete characterisation. After a preliminary macroscopic observation conducted with a stereoscopic microscope, all the samples were prepared in polished sections and analysed with the following techniques: Scanning Electron Microscopy (SEM-EDS) for textural examination and qualitative chemical characterisation of the glassy matrix and the inclusions, Electron Probe Micro Analysis (EPMA) for a precise and accurate chemical analysis of the glass matrix; X-ray

Powder Diffraction (XRPD) for the mineralogical analysis and identification of the main opacifying agents.

The majority of the *tesserae* are made with soda-lime-silica glass with natron as a flux and can be related to the Roman glassmaking tradition. In the orange and red *tesserae* a high lead content (up to 30 wt% PbO) was often detected.

The most common chromophore element is copper, some blue and azure *tesserae* are cobalt-coloured and only a few are iron coloured.

The majority of the samples are opaque or semi-opaque, due to the presence of opacifying crystals. In the three assemblages here investigated, all the cobalt-coloured blue, the white and the grey *tesserae* are opacified with Ca-antimonates; the orange and red are coloured and opacified by means of cuprite crystals and metallic copper nanoparticles, respectively.

Some technological differences were identified among the *tesserae* of the chromatic macro-groups yellow, green and turquoise: Pb- antimonates are the main opacifying phases in the yellow and green samples from Trento and Pordenone, while in Aquileia Pb- stannate is also present. Some turquoise *tesserae* from Aquileia and a single case from Pordenone are partly opacified with abundant gas bubbles and relics of quartz.

In conclusion the results of the present study, still in progress, show that glass *tesserae* from the inland cities of Trento and Pordenone are strongly linked to the early Roman technology in all the chromatic categories, suggesting in both cases an early dating for the *tesserae*. On the contrary in the Aquileian mosaic, precisely dated to the second half of the 4th century AD, some new techniques and uncommon solutions were identified, suggesting a prompt reception of the technological innovations of the 4th century.

Bueno, M., Mantovani, V., Novello, M., 2012. 'Lo scavo della casa delle Bestie Ferite', In: Bonetto, J., Salvadori, M. (Eds.), *L'architettura Privata ad Aquileia in Età Romana, Atti del Convegno di Studio* (Padova, 21-22 Febbraio 2011). Padova University Press, Padova, pp. 77–100.

Conte, A., Salvadori, M., Tirone, C., 1999. *La villa romana di Torre di Pordenone. Tracce della residenza di un ricco dominus nella Cisalpina Orientale*. Quasar, Roma.

Guaitoli, M., 2011. 'Il progetto di Santa Maria Maggiore (Trento). Relazione preliminare: dallo scavo alla diffusione dei dati'. FOLD&R FastiOnLine Doc. Res. 1–18.

Grant report: Researching the Early Islamic Glass Industry

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Israel and Egypt were major players in the natron glass industry, at various times both supplying the glass for the Roman and Byzantine empires. However, the status quo was dramatically interrupted in the 7th century by the Islamic conquests, but how this change affected the glass industry is not fully understood. Questions on technological and organisational change remain. In particular, when did plant ash replace natron as the primary flux of glass production? And did the split of production into primary and secondary stages continue? My PhD aims to answer these questions through analysis of glass taken from sites in Israel.

From the 1st to 7th November the AHG part funded my visit to Jerusalem. The reasons for this trip were two-fold, firstly, to collect an additional 200 samples of well-dated glass from the store rooms at the Israel Antiquities

Authority (IAA), and secondly, in order to present my current findings to the IAA Glass Committee. This visit followed an extremely successful sample collection trip early in 2013, also part funded by the AHG, which provided almost 100 samples. The subsequent data produced during analysis has already enlightened us on a number of major changes in the glass industry producing promising conclusions. The results of which were presented at the International Symposium on Archaeometry, LA (2014) and the 'Things that Travelled' conference, London (2014). Furthermore, academic papers are in preparation for publication.

In total 4 days were spent at the IAA in Jerusalem. Glass was sampled from excavations across Israel procuring glass dating from the 7th to 12th century (Late Byzantine up to Crusader). The samples were of drawn, diagnostic

forms, the majority of which are from published excavations with separate glass reports. The aim of this second trip was to target samples of glass from sites that were not sampled before, to get a greater geographical spread of the country, to get contrasting locations (coastal vs inland, urban vs rural) and finally, to concentrate on dates previously under sampled - primarily 9th-11th century Abbasid-Fatimid periods. A total of approximately 200 samples were taken from eight sites, including the urban sites of Caesarea, Jerusalem, Ramla and Tiberias; rural sites of Tel Rosh and Nahal Shovel; and the military sites of Ashdod Yam and Ha-Bonim. Photos were taken, contextual information and drawings recorded and small, 1-5 mm samples, removed.



Fragment of late 6th-8th century AD bottle with blue trails and pinched decoration © Matt Phelps

One highlight of the trip was a chance to present my work during a 45 minute presentation to the Glass Committee and other IAA staff. These were people that had excavated, identified, recorded and curated many of the vessels which I had sampled. I was able to update them on my current findings, answer questions on my techniques, but also, crucially, I was able to get feedback on my work from the glass specialists.

On my final day in Jerusalem I was given the opportunity to tour the extensive glass collections at the Israel Museum under the guidance of Na'ama Brosh (curator of the Islamic gallery). Highlights included the Roman and Byzantine glass room (curated by Natasha Katsnelson) which displayed a section on glass working and decorative techniques, and of the Islamic glasses, particularly the Umayyad and Abbasid period vessels. This was a successful and enjoyable trip, made possible by the generous funding from the AHG.

QUERY

The editors of Glass News have kindly offered to pass some questions on to your group, however they have evolved since I first sent in the request.

I have been collecting goggles for a while now and am confused about the origins and relationship between 'Triplex Safety Glass Co, Ltd, 1 Albemarle Street, Piccadilly, London' set up in 1912 and 'Triplex Goggle, Mask & Lens Co. Ltd, London' set up in 1917. Also where did they go?

John Clark [AHG Board member] has helped point me in the right direction, most importantly by pointing out that the Pilkington web site which says Triplex was set up 1923, is factually wrong; that is the date they took over the name.

I now have more detailed questions.

1. Whose Triplex patent were they using from 1912; John C. Wood's in the UK or Edouard Bénédictus's French one?
2. It is interesting that in the 1917 notice of new companies, the name J.H. Bulford appears as director of Triplex goggle, Mask & lens Co. Ltd., as Newbold & Bulford Ltd (est. 1796), was an old name in the London glass instrument business. So did this old family set up these Triplex companies in 1912 and 1917 as a subsidiary? Harry Newbold is registered in the US patent office as the designer the Triplex goggle which became the RAF MkII.
3. Was the Triplex Goggle, Mask & Lens Co, set up as a subsidiary of Triplex Safety Glass Co, to deal with the large RFC/RAF goggle contract awarded to them in Dec. 1916?
4. Was the takeover of the Triplex name in 1923 by Pilkington amicable or not?
5. What happened to the original two Triplex Co's.? Did they become SLM (abbreviation of ?), which produced the RAF MkII/Harry Newbold pattern goggles and others through to WWII?

Thanks for any help.

Steve Saunders
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NEW BOOKS



Reflets de Venise
Baumgartner, Erwin
Vitrocentre Romont, 2015
ISBN 978-3-0343-1665-1
€48.20

The glasses produced in the 16th and 17th century Venice or elsewhere *à la façon de Venise* are unanimously recognised as the most beautiful and most valuable of their time. They were intended for Kunstkammern of princely residences, and wealthy bourgeois houses across Europe. A small part of them, thanks to fortunate circumstances, were preserved until today. This volume presents a selection of about 190 complete glasses from Swiss collections, shown in full page images and accompanied by a detailed description and comment. The catalogue also includes more than 200 fragments discovered in archaeological excavations. It shows, for the first time, a broad overview of the types of Venetian or *façon de Venise* glass that was found in Switzerland in the 16th and 17th centuries. Research has also shown that some glasses that, until the end of the twentieth century, were thought to be Venetian, are actually products of Swiss glassworks.

BOOK REVIEWS

Römische Gläser aus Gräbern an der Luxemburger Straße in Köln Typologie, Chronologie, Grabkontexte In: Kölner Jahrbuch. Herausgegeben vom Römisch-Germanischen Museum und der Archäologischen Gesellschaft Köln 45. Band, 2012

Dela von Boeselager

Gebr. Mann Verlag Berlin, 2014
ISBN 978-3-7861-2681-2
€85

For several years the author has worked on the history of the excavations at the great cemetery along Luxemburger Straße, the south-western arterial road of Roman Cologne

with special focus on the glass findings. In an exemplary fashion she has described and classified the glasses and published a great number of them for the first time. By studying the glasses in their original context she widely outclassed the usual ways of just describing, categorizing and illustrating the objects.



Roman water pitcher, cups and plate, found at Luxemburger Straße, Cologne © Römisch Germanisches Museum, Cologne

In extensive introductions the author discusses the state of research and vividly retraces the history of the excavations during the 19th and 20th centuries, most of which have not been conducted by professionals. Further texts are dedicated to the modes of entombment, the function of the glass vessels in this connection, the social background of the buried, questions concerning the glass workshops and the chronological development of Roman glass art in the Colonia Agrippina over the centuries. The tables of forms on pages 59-64 of the book provide a very useful survey of the range and character of production of the glass workshops in Cologne during the 1st to 4th centuries.

The catalogue is divided into two parts. The first one deals with the glass findings, presenting them in groups according to their shapes. Each one of these groups – 77 in total – is thoroughly discussed under the headings “Grabtypus und Fundlage” (type of entombment and position of findings), “Form und Technik” (form and technique), “Verwendung und Gefäßkombination” (usage and vessel combination) and “Datierung” (dating).

The publication gains additional and crucial value by the second part of the catalogue. It documents the complete content of the glass containing tombs. In drawings and photographs alongside with the glasses all associated finds made of other materials are presented, this way providing the archaeological context of the objects. This gives hints for the social status of the deceased and

illustrates the significance of glass vessels for the respective tombs and Roman burial culture in general.

This procedural method is new for glass research in Cologne. Until now the other finds in a tomb remained widely unconsidered for cataloguing and dating glasses in the collection of the Römisch Germanisches Museum in Cologne. Concentrating on the total of all finds in a tomb, as they are documented in the museums archive, the author arrives at results of dating that are by far more accurate and reliable than those of earlier studies.

In this detailed analysis of an important part of the Roman legacy the publication is a major contribution for an overall view of Roman glass art in Cologne combined with an in-depth update of the state of research. This way the commendable work of Fritz Fremersdorf and others gets some valuable correction and completion.

Helmut Ricke



**Little Things in Glass
(and metal and plastic
too)**

Tom J Lawson
GML Publishing, 2014

ISBN 978-0-9542354-1-3

Available for £12.90
including P&P in the UK,
from The Great British
Bookshop

Mention the history of glass and images of windows, wine glasses, or bottles probably come to mind. However this well-researched book reminds us that there are a whole host of other little things in glass that we take for granted, but without which modern civilisation as we know it would not exist – traffic lights; lenses; scientific, industrial and transport instruments of all kinds; buttons; syringes; insulators and marbles - to name but a very small sample. This book by Tom Lawson, subtitled “The Biography of the English glass Company Ltd 1934 to 1990” gives an insider’s view (complete with copies of original documents) of a company that went from technical bankruptcy in 1939 to being listed amongst the country’s top 100 private companies in the 1980s. Rare, and possibly uniquely, for a glass history volume this book provides insights into the backgrounds of some of the key players and their strategies and decision-making over the years, as well as the organisations and products that resulted.

An interesting read and one particularly recommended for those wishing to understand more about the detailed mechanics of a glass-making company that are usually submerged under the vague heading of ‘technology’.

Colin Brain

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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.

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

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for *Glass News* **39**
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27th November 2015

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