Glass News

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Sarah Jennings working on the glass finds from Butrint, Albania © Dylan Cox

Welcome to Glass News Issue 32!

The main event of the autumn is the AHG and Medieval Pottery Research Group's conference in honour of Sarah Jennings which will be held on the 16th of November at the Wallace Collection. The title of the conference is *Recent Research and New Discoveries in Glass and Ceramics* and details of the speakers can be found on the following page.

A study day is also planned for the 24th of November with the Georgian Glassmakers. This event will include practical demonstrations of glassmaking and discussions of documentary evidence and scientific analysis of British crystal glass from 1660-1700.

This autumn there are also conferences and meetings organised by the AIHV, AFAV, British Glass Foundation and Society for Glass Technology. A packed and exciting schedule!

We also have three fantastic grant reports on Roman and Iron Age glass and a number of very interesting articles. Thanks once again to all the contributors to this issue. Please keep sending articles, notes, queries and reviews in for future issues! See back page for contact details.

Check out the newly designed AHG website which has been re-launched at: www.historyofglass.org.uk

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!

AHG MEETINGS

Recent Research and New Discoveries in Glass and Ceramics: A Conference in Honour of Sarah Jennings

Friday 16 November 2012
The Wallace Collection, London

Organised by the Medieval Pottery Research Group & the Association for the History of Glass

The day will start at 10am with registration and coffee, finishing with a wine reception in the evening. Some wonderful speakers from among Sarah's many friends and colleagues in the worlds of glass and ceramics will be presenting.

- Hugo Blake and Michael Hughes - An early fourteenth-century tin-glazed earthenware jar from Norwich and other archaic maiolicas excavated in Britain
- Hilary Cool - Aromatic Assemblages: Exploring the Finds from Pompeii Insula VI.1
- George Haggarty - The Delftfield Pottery, Glasgow, 1748 -1826; Demolition and Resurrection
- Ian Freestone - Red, White and Blue: the Origins of Medieval Window Glass Technology
- David Whitehouse - Before Venice: The Antecedents of the Venetian Glass Industry

Other confirmed speakers are Katherine Barclay and Frans Verhaeghe. Further details will follow; for updates please see the AHG and MPRG websites at:
www.historyofglass.org.uk or
www.medievalpottery.org.uk

This is a joint meeting between the AHG and the MPRG so may be more heavily subscribed than usual - please book early to avoid disappointment.

If you would like to attend please send your full contact details with a cheque for £25 or £10 (students) payable to The Association for the History of Glass Ltd, to Jennifer Price, Garth End, Well Garth, Heslington, York YO10 5JT. Participants from abroad may pay on the day but need to book a place by emailing **jennifer.price@durham.ac.uk**. Receipts will be sent by e-mail, or by SAE (if sent) or on the day.

The AHG AGM will be held during the lunch break (details will be sent out nearer the time). AHG members wishing to attend only the AGM may do so free of charge.

The Evidence for British Crystal Glass 1660-1700

Saturday 24 November 2012
Project Workshops, Quarley, Hampshire, SP11 8PX

This Study Day will be held with "Georgian Glassmakers" Mark Taylor and David Hill (see www.georgianglassmakers.co.uk). It will centre on practical demonstrations of late seventeenth-century glassmaking techniques and provide opportunities, in a relaxed practically-based setting, to discuss evidence for how this glass was made. The study of seventeenth-century glass has benefited from many authors' contributions, but these often involved significant conjectures to fill-in gaps in the sparse evidence then available. With time and repetition it has become difficult to separate fact from informed speculation and newly-available evidence has yet to be widely assimilated. This study day aims to help clarify matters by considering the following sources of period evidence:

- Practical demonstration of glassmaking tools & techniques
- Results of experimental glass melts
- Archive documentary evidence for seventeenth-century crystal glassmaking (Mike Noble has kindly agreed to assist with this topic)
- Scientific analysis of archaeological glass and glassmaking finds (David Dungworth has kindly agreed to assist with this topic)

Approximate Programme

10.00 Arrival and coffee

10.30 Practical demonstrations 1 – the basics of lead crystal glass making

12.30 Lunch and opportunity to discuss other sources of period evidence (this will be held on the first floor with access via a flight of stairs)

14.30 Practical demonstrations 2 – making vessels

16.30 Close

Because of the practical elements during this day, numbers will be limited to approximately 12 attendees on a first-come basis. Plentiful tea, coffee and biscuits will be provided. Due to the setting it is not easy to 'pop-out'

for lunch, so a buffet lunch is included in the price. Please let Colin & Sue Brain know if you have any dietary restrictions.

If you would like to attend, please send your contact details, a stamped addressed envelope and cheque for £54, payable to: The Association for the History of Glass Ltd, to C & S Brain, 10 College Street, Salisbury, SP1 3AL (email **cbrain@interalpha.co.uk**).

Receipt will be by email, SAE, or on the day (participants who normally live outside the UK may pay in UK sterling upon arrival at the venue).

OTHER MEETINGS

Heavenly Light: The Stained Glass of Gloucester Cathedral

A Study Day led by experts in the Cathedral's glass

The next available date, open to all, is **1st October 2012**, 10am-3.45pm. Further study days are planned for 2013. Further dates can be arranged for groups and societies.

This is an opportunity to learn about the making of a stained glass window, how to 'read' a window, and to study some of the finest stained glass in the country, installed from the mid-1300s to the late twentieth-century. The Great East Window, in particular, is of international importance. At the time of its installation in the 1350s it was the largest window in the world, and most of its original glass survives. The early twentieth-century glass in the Lady Chapel is generally acknowledged to be the best of the Arts and Crafts movement.

Tickets £20 per person including lunch. Numbers are limited to 25. All proceeds go towards the upkeep of Gloucester Cathedral.

Binoculars are an advantage. Participants need to be able to climb stairs and walk on uneven floors.

For further information and to make a booking please contact Christine Turton, The Cathedral Office, 12 College Green, Gloucester; 01452 508210;

christine@gloucestercathedral.org.uk

See the AHG meeting review on page 6.

AIHV19
PIRAN SLOVENIA 2012
Association Internationale pour l'Histoire du Verre
International Association for the History of Glass

The 19th Congress of the Association Internationale pour l'Histoire du Verre will take place in Piran, Slovenia, from Sunday 16th to Friday 21st September. There is a full programme of two parallel lectures sessions each day and two poster sessions, as well as visits to museums and collections in Ljubljana and Aquileia. It is now too late to submit abstracts for presentation, but registration is still open.

Congress Fee:
AIHV members: 260€, Students: 130€, Non-AIHV members: 320€, Accompanying person: 130€

Provisional programme

Sunday, 16 September
Registration
Guided tour of Piran
Monday, 17 September
Welcome speeches
All day lecture sessions on glass from the 2nd and 1st millennium BC, Bronze Age, Iron Age, Hellenistic, Byzantine and Roman periods.
Tuesday, 18 September
Morning lecture sessions on glass from the Hellenistic, Roman, Post Roman and Islamic periods
Afternoon museum visits in Ljubljana
Wednesday, 19 September
All day lecture sessions on glass from the Roman, Islamic periods and Venetian and Façon de Venise glasses
Poster session 1
Optional wine tasting
Thursday, 20 September
Morning lecture sessions on glass from the Roman and Late Roman periods and 17th-19th centuries
Poster session 2
Excursion to Aquileia, Italy
Friday, 21 September
Morning lecture sessions on glass from the Late Roman period, 18th-19th centuries and Modern era.
General assembly of the AIHV
Closing session

For further details and to book see www.zrs.upr.si or email aihv19@zrs.upr.si

Association Française pour l'Archéologie du Verre (AFAV)

9 and 10 November 2012
Musée d'Aquitaine, Bordeaux

The 26th annual meeting of the AFAV aims to compare research from France, Belgium, Germany, Switzerland and Luxembourg on the history of glass.

The registration fee for this meeting is 50€ (25€ for students). This includes lunches on Friday and Saturday. To be able to take part in this meeting you, or your institution, must have paid the annual fee for the AFAV (15€ for students, 30€ for individuals and 50€ for institutions).

A list of hotels in the centre of Bordeaux, and the room rates, will be announced later on the AFAV website.

For more information and to register see: www.afaverre.fr/

From Rome to Stourbridge: 2000 years of cameo glass

22 August 2012
Hagley Hall, nr Stourbridge, West Midlands

This meeting is organised by the British Glass Foundation with the support of the Glass Association & Friends of Broadfield House as part of the celebrations of 400 years of glassmaking in the Stourbridge and Dudley areas. It will include presentations by world-renowned experts on the history of cameo, together with the public unveiling of contemporary examples

Programme

14.00 Registration and Coffee
14.30 – 15.30 "Ancient Roman Cameo Glass" by Dr. Paul Roberts
15.30 – 16.00 Short Interval
16.00 – 17.00 "The Glories of Stourbridge Cameo Glass" by Charles Hajdamach
17.00 – 17.30 Unveiling of the 2012 replica of The Portland Vase and introduction to its creators Richard Golding, Terri Colledge and Ian Dury.
17.30 – 19.00 Wine and canapés

Cost: £38 per person to include coffee, wine and canapés. Numbers will be limited to 135 available on a first come/first served basis. Cheques made payable to "British Glass Foundation" together with an A5 SAE should be forwarded with the booking form to:

Meriel C Harris, 44 Sandy Road, Norton, Stourbridge, West Midlands DY8 3AH.

If you have any queries please call Meriel on:
+44 (0)1384 393498.

A new Jerusalem

13 October 2012
Thornhill Parish Church, Dewsbury, WF12 0JZ

The fifteenth-century glass of the east window of the Savile Chapel at Thornhill is a rare depiction of the Heavenly City. Now in an advanced state of deterioration, it was recorded in careful detail by its nineteenth-century restorers. A multidisciplinary collaboration has resulted in the decision to create a replica window and display elements of the ancient glass within the Savile Chapel.

This conference, bringing together glass science, art history and conservation, aims to examine the how and why of this uniquely fascinating project, and promote informed debate.

Speakers include Sarah Brown MA, Dr David Martlew and Jonathan Cooke ACR. Price £10 Students £5 includes buffet lunch, tea and coffee, which makes it extremely good value!

For more information and booking see
www.thornhillparishchurch.org.uk/stainedglassday.htm

Society of Glass Technology Annual Conference: Living Glass

5-7 September 2012
Murray Edwards College, University of Cambridge

The 2012 SGT conference will be held at the University of Cambridge. The three threads of science, art and technology will be covered: science will cover key themes from novel materials and fabrication routes to structure and properties; technology will include areas such as the environment, fuel usage, modelling and glass applications; and art and history will make reference to the long traditions of stained glass in the colleges and religious buildings of Cambridge. There will also be a New Researchers Forum and a Workshop.

For more information see:
www.cambridge2012.sgthome.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

OBITUARIES

Veronica Ann Tatton-Brown
1944-2012

Veronica Tatton-Brown, who died in Salisbury on 2nd March this year after a long illness, was very well known and greatly respected by researchers in ancient glass throughout the world. She was based in the Greek and Roman Department of the British Museum as Assistant Keeper of the Ancient Cypriot collections and Curator of the Glass Collections from 1974 until her retirement in 2004. Throughout that period, she was notably generous with her time and expertise in welcoming and helping many hundreds of visiting scholars.

Veronica joined the British Museum to assist Donald Harden with the publication of the glass collections in the Greek and Roman Department, and although her principal research specialism was the archaeology of ancient Cyprus, she quickly developed wide-ranging interests in ancient glass and worked towards the publication of the collections throughout her career in the museum.

She enjoyed collaborating with other researchers on glass projects, and many of her publications resulted from these links. She became particularly interested in the value of modern experimental glassworking for understanding production techniques of ancient glass, and spent a lot of time discussing such issues with Bill Gudenrath (Corning Museum of Glass) and David Hill and Mark Taylor (Roman Glassmakers, Andover).

Her glass publications included chapters on 'Rod-Formed Pendants and Beads' in *The Catalogue of Greek and Roman Glass in the British Museum, Volume I* by D B Harden (BMP, 1981), on 'Rod-Formed Pendants' in *Catalogue of Western Asiatic Glass in the British Museum, Volume 1* by D Barag (BMP, 1985) and on 'The Glass' in *Excavations at Carthage: The British Mission Volume I,1* by H R Hurst and S P Roskams (University of Sheffield/British Academy, 1984). She presented and published numerous notes on specific aspects of pieces in the British Museum collections in conference proceedings, such as the *AIHV Annales,* and periodicals, such as *Glass News*, and did some work on glass finds from excavations in Britain. Her writing also reached a much wider audience; in particular, her three chapters (Before the Invention of Glass Blowing; The Roman Empire; Early Medieval Europe AD 400-1066) in *Five Thousand Years of Glass* edited by H Tait (BMP, 1991) were carefully and clearly drafted to communicate the range and significance of the glass of different periods to the general public. She worked on volume 2 of the Greek and Roman catalogue when time allowed, but her illness prevented her from completing this, although the first part, *Roman Cameo Glass* by P Roberts, W Gudenrath, V Tatton-Brown, D Whitehouse (BMP 2010) has now appeared in print.

In the thirty or so years that I knew her, Veronica was a great colleague and glass-friend. Always devoted to her family, she was generous and entertaining company, sometimes rather quiet in conversation though expressing her opinions succinctly and crisply when necessary. She was an active member of various organisations involved with the study of glass. She frequently took part in the ICOM Glass group meetings, and was a valuable member of the Board of AHG from 1996 to 2004, when she was deeply involved in planning and running the 16th Congress of the International Association for the History of Glass hosted by AHG in London in September 2003. Many of us will remember her happily making smoked salmon sandwiches for the final party we held at the Society of Antiquaries!

Jennifer Price

Axel von Saldern
28 July 1921-2 June 2012

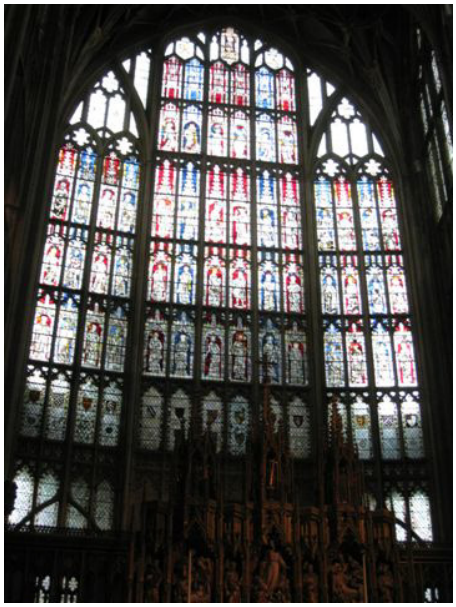
Axel von Saldern was a great glass scholar with a wide range of expertise. He worked as a curator in the Corning Museum of Glass, the Brooklyn Museum of Art and the Kunstmuseum in Dusseldorf before becoming director of the Museum für Kunst und Gewerbe in Hamburg in 1971, and he wrote extensively on the glass of the ancient and modern worlds in museums, private collections and archaeological excavations. His most recent work on

glass (*Antikes Glas. Handbuch in Archäologie*, 2004) was a comprehensive survey (over 700 pages) of glass from its beginnings to the end of the Roman Empire. He had great personal charm, and the enviable ability to move between English, French and German in public speaking and conversation. He was an active member of AIHV for many years, attending congresses from the early 1960s until 2001 and serving as President from 1985 to 1991.

Jennifer Price

MEETING REVIEWS

AHG Spring Study Day
The Stained Glass of Gloucester Cathedral
31 March 2012



The Great East Window, Gloucester Cathedral © Rachel Tyson

On 31st March a band of us met at Gloucester Cathedral, to be led for the day by four cathedral volunteers: Richard Cann, Susan Hamilton, Robin Lunn and Karen Preece. They had previously completed an inventory, photographed and researched the stained glass, and developed this into an extremely informative and interesting tour offered to groups and members of the public. Coffee is always a good way to start, especially in the beautiful surroundings of the Chapter House, where we were given a most impressive PowerPoint presentation with an overview of the cathedral's glass. While there is not space here to document every window we saw, some of the most memorable features of the day are included below.

Members viewing the Great East Window, Gloucester Cathedral © Sandy Davison

The highlight of the medieval glass was the Great East Window of *c*.1350, which was incredibly the size of a tennis court, all the more extraordinary when one realises that the cathedral was merely an abbey church at the time with an audience of only up to sixty monks. The window celebrates the Coronation of the Virgin, and is made up largely of tiers of figures in niches. The figures' features showed a local style thought to be a Bristol workshop, and the beginnings of perspective were pointed out to us. Some of the panels had amazing detail; one showed twenty-two different instruments of the Passion.

Other medieval glass had survived in the Lady Chapel's East Window where the glass was somewhat jumbled, and some had originally been in other parts of the cathedral, but was very revealing about the glazing history. We had a marvellous demonstration, with the aid of moving computer graphics, in re-uniting a mismatched top and bottom panel from different areas of the window! The Lady Chapel also contained pieces of medieval glass in the tracery lights between the nineteenth-century Whall panels. As an Arts and Crafts admirer of the medieval technique, Whall re-used medieval glass where appropriate.

An important feature of Gloucester Cathedral is the quality of the nineteenth and early twentieth-century glass, beginning when it was decided in 1854 that future memorials should be in the form of windows. Many are the design of the later well-known craftsmen Hardman, Clayton and Bell, and Whall, all of whom were strongly influenced by the medieval style. The finest of these are Whall's windows of 1898-1904 in the Lady Chapel, which used slab glass to create an uneven thickness of glass and thus more texture. We had an interesting discussion about the windows' faces, many of which had faded paint, caused by the glass composition which contained borax and had wept. A charming series of windows in the lavatorium by Hardman were inspired by

water, such as the colourful Noah's Ark with rainbow. The day finished in the chapel of St Thomas surrounded by the intense drama of Tom Denny's colour-saturated windows installed in 1992.

It was a wonderfully informative and friendly day, and we would all like to thank the Gloucester volunteers and Sandy Davison for organising it. The delicious lunch provided for us in the medieval Parliament Rooms was particularly enjoyable. If you were unable to attend this meeting and would like to see the glass, the tour is available to book for groups and members of the public, the next date being 1st October 2012 (see page 3). I suspect that the tour is different every time depending on the interests and expertise of the particular audience. On returning to Wiltshire I saw my local church's nineteenth-century windows (which include one by Whall) in an entirely new light!

Rachel Tyson

AHG Grant Report: Beyond Typology: Iron Age Glass Beads in their Social Context

Elizabeth M Schech,

Doctoral Candidate, Durham University
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Although faience beads and some glass beads are found in Bronze Age contexts in Britain, the earliest occurrence of glass objects in Britain occurs in the Iron Age (*c*. 800 BC – AD 100). These are mainly in the form of bangles and beads, although by the later Iron Age other objects, such as gaming counters and vessels begin to appear. Glass beads are perhaps the most prolific of glass objects from this period and, like bangles, they were presumably worn on the body. However, the evidence for their use as body adornments is limited due to the lack of burial contexts, as inhumations appear to be constrained by both chronology and region. Although some single beads occur in inhumations, there is evidence to suggest that in other cases multiple beads were worn together perhaps as necklaces (for example, the Queen's Barrow near Market Weighton, and several burials at Wetwang Slack, both in the East Riding of Yorkshire).

Figure 2: A Guido Class 11a 'Meare variant' bead from Wetwang Slack burial 102 (KINCM:2010.7.306) © Hull and East Riding Museum, Hull Museums

Past approaches to glass beads have focussed on classification and chemical composition through XRF analysis (Guido 1978; Henderson 1982). Although these methods have formed a framework for future research, this research project takes a different approach. Through the use of four study regions, this analysis is not only interested in the physical characteristics of the glass beads themselves, but also in the depositional context that they are found in. However, these will be studied within the context of body adornment, in order to address ways in which identity was expressed, built, and modified.

Figure 1: A Guido Class 6a 'Oldbury' bead from Rudston Roman Villa (sf 40, KINCM:1986.1826.158, © Hull and East Riding Museum, Hull Museums

After completing an extensive review of the published literature, funding from the Association for the History of Glass, along with financial support from the Prehistoric Society and the Rosemary Cramp Fund, contributed towards consultation of two important sources of supplementary data. First, it was possible to visit 10 Historic Environment Record (HER) offices within the study regions. This has allowed the rapidly growing body of commercial 'grey-literature' reports to be added to the research database. Approximately 750 additional excavated sites within the study regions had Iron Age and/or Roman period activity. Interestingly, with a few exceptions, the preliminary results of this combined literature review suggests that glass beads remain a rare artefact on sites of both these periods. However, there are

a number of factors that could be obscuring this observation, such as size and placement of excavation.

Figure 3: A selection of beads from Wetwang Slack burial 249 (KINCM:2010.7.310) © Hull and East Riding Museum, Hull Museums

Secondly, it was possible to visit 13 museums in order to measure, describe and photograph 1,390 glass beads (Figures 1-3). This has proved to be a crucial experience, as in many cases reports of glass beads are vague and there is little comparability between authors. In addition, this has allowed the creation of a photographic record of a large number of glass beads. This has been useful for the study of glass beads from the East Yorkshire Iron Age burials as these beads are found in the Yorkshire Museum, the Hull and East Riding Museum, and the British Museum. This has been especially vital as the glass beads from Wetwang and Garton Slack remain largely unpublished. Preliminary analysis suggests that the current classification system needs to be tested and possibly restructured in order to account for the amount of variability observed during this fieldwork.

The analysis of the data is currently on-going. Part of this analysis will involve the examination of the use of different decorative motifs and the way in which colour was used to create glass beads. This will not only form part of a larger discussion on the use of colour in the Iron Age, but will also address the use of bodily adornment during this period. Through this study, glass beads will be placed in the context of other objects of adornment and it is hoped that a better understanding of identity through material culture will be enabled.

Finally, I would like to thank the Association for the History of Glass for their generosity and financial support of my research on glass beads. The data collection from both HERs and museums will provide a valuable dataset in which to interpret the use of glass, colour and design in the Iron Age.

References

Guido, M. 1978. *The Glass Beads of the Prehistoric and Roman Periods in Britain and Ireland,* London: The Society of Antiquaries of London report no. 35

Henderson, J. 1982. X-Ray Florescence Analysis of Iron Age Glass, University of Bradford: Unpublished PhD Thesis

AHG Grant Report:
A 'true' Roman glass: evidence for primary production in Italy

Monica Ganio

PhD student Department of Earth and Environmental Sciences, Section Geology, Katholieke Universiteit Leuven, Celestijnenlaan 200E – bus 2410, BE-3001 Leuven, Belgium. Funded by Fonds Wetenschappelijk Onderzoek (FWO)
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The *chaine operatoire* for the production of glass in the Roman period is still the subject of a lively debate. Where were mass producing 'primary' factories situated, and how was the transport of raw glass arranged? Was glass production in early Roman times primarily situated in the Near East, and was glass transported as chunks to 'secondary' factories to be re-melted and formed into objects? The homogeneous composition of most Roman glass seems to indicate this. Or was this stability in chemistry due to a high number of smaller primary workshops using similar recipes? Or did intense recycling and the trade of broken glass and cullet play a role?

With a particular eye on the words of Pliny the Elder, who wrote in his *Naturalis Historiae* (XXXVI, 194) that sands not only from the Syro-Palestine coasts but also from the Spanish and French coasts and from the land between Cumae and Liternum in Italy were used to produced primary glass, the provenance of glass excavated along the Italian peninsula is being investigated.

198 glass samples, dated to the first- to fourth-century AD, are being studied using a combined approach of elemental and isotope analyses. The glass samples represent the Italian peninsula well, with specimens discovered on the Iulia Felix shipwreck, sank off the coast of Grado (Friuli Venezia Giulia), samples excavated in Potentia, a Roman town situated in the vicinity of Ancona (Marche), from the famous towns of Pompeii and Herculaneum (Campania), from Augusta Praetoria, modern Aosta (Valle d'Aosta), and samples

discovered in the Embiez shipwreck, which sank not far from Marseille (France). The majority of glass samples are colourless, both naturally and decoloured, but coloured glasses mainly from blue to blue-green, some greens and yellows, and one red opaque glass fragment are also included in the assemblage.

Pale blue-green pillar molded bowl (Palestine, first century AD) © Sara Boyen

The use of combined elemental and isotope analysis is a well-established practice in the studies of artefact provenance. The homogeneous composition of Roman glass does not allow the use of major elements for the discrimination of groupings with respect to the geographic origin of the raw materials. Nevertheless, trace elements can help to separate compositional groups and to assign individual objects to them. Isotope analysis of Sr (from the lime-rich raw materials) and Nd (from the heavy mineral content of the glassmaking sands) allow different sand sources used for primary glass production to be distinguished and characterised. The isotope ratio data obtained for the glass samples are compared to an established sand database, which also includes relevant sands from the regions described by Pliny the Elder and primary glass from known production centres in the eastern Mediterranean (Brems et al.).

The elemental analyses were carried out at the Centre for Archaeological and Forensic Analysis of Cranfield University (UK) using a New Wave Research ESI 213nm laser ablation system coupled with a Thermo Scientific X-Series 2 inductively coupled plasma mass spectrometer (LA-ICP-MS). The isotope analyses were carried out at the University of Ghent (Belgium) using a Thermo Scientific Neptune multi-collector inductively coupled mass spectrometer (MC-ICP-MS).

A first look at the elemental analyses indicates that all of the glasses were of the soda-lime-silica type. Natron was the flux used for most of the samples, with the exception of nine glass samples, all dark green in colour, that show a higher concentration of MgO and K_2O. This occurrence has to be investigated further. The red opaque glass shows very high concentrations of Cu, Sn and Pb, while the blue samples have both Co and Cu in comparable amounts. Colourless glasses are rich in either MnO or Sb_2O_5. Trace elements such as Cu, Mn, Mo, Ni, Sb, Pb and Zn are shown to be indicative of recycling, while elements such as Zr, Hf, Ti, Sn and Cr tend to be closely associated with heavy minerals in the sand composition, and show a similar indication of provenance as isotope analysis. $^{87}Sr/^{86}Sr$ isotope ratios suggest that all of the samples were made using beach shells as lime source, while $^{143}Nd/^{144}Nd$ isotope ratios indicate a variety of signatures, mostly associated with eastern Mediterranean sands. These included areas which differed from the established Roman glass producing areas of the Syro-Palestine and Egyptian coasts.

I wish to thank the Association for the History of Glass for the generous funding that financed my travel to Shrivenham, UK, and the work at Cranfield University. A special thanks goes to Dr. Andrew Shortland and Rita Giannini, who supported and helped me carry out the LA-ICP-MS analyses.

I would also like to thank Dr. Patrizia Framarin and Dr. Lorenzo Appolonia of the Soprintendenza per i Beni e le Attività Culturali della Valle d'Aosta, for the Augusta Praetoria glass samples, Prof. Gianmario Molin and Dr. Alberta Silvestri (Università degli Studi di Padova) for the Iulia Felix shipwreck samples, Dr. Danièle Foy (Centre National de la Recherche Scientifique) for the Embiez shipwreck specimens, Dr. Luigia Melillo and Dr. Valeria Sampaolo of the Soprintendenza Speciale di Napoli e Pompei and the Museo Archeologico Nazionale di Napoli, for the Pompeii glasses, Prof. Giacomo Chiari and Dr. Marc Walton (Getty Conservation Institute) for the Herculaneum samples, and Prof. Frank Vermeulen and Dr. Patrick Monsieur of the University of Ghent, for the samples from Potentia.

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Brems, D., Ganio, M., Latruwe, K., Balcaen, L., Carremans, M., Gimeno, D., Silvestri, A., Vanhaecke, F., Muchez, Ph. and Degryse, P. in press. 'Isotopes on the beach part 1 - Strontium isotope ratios as a provenance indicator for lime raw materials used in Roman glassmaking'. *Archaeometry*

Brems, D., Ganio, M., Latruwe, K., Balcaen, L., Carremans, M., Gimeno, D., Silvestri, A., Vanhaecke, F., Muchez, Ph. and Degryse, P. in press. 'Isotopes on the beach part 2 - Neodymium isotope analysis for provenancing Roman glassmaking'. *Archaeometry*

AHG Grant Report:
Lenses in Roman Egypt: Archaeological and Papyrological Evidence

Jane Draycott

2011-12 Rome Fellow, British School at Rome
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According to Aulus Cornelius Celsus, the author of the first-century AD Latin medical treatise *De Medicina*, 'there are grave and varied mishaps to which our eyes are exposed; and as [our eyes] have so large a part both in the service and the amenity of life, they are to be looked after with the greatest care' (*De Med*. 6.6.1). Scores of documentary papyri, ranging from letters, to medical reports, to legal petitions, attest that such 'grave and varied mishaps' occurred regularly in Egypt during the Roman period. However, there is also evidence to suggest that defective vision arising from eye strain, short-sightedness, or even the natural aging process, which would today be treated with glasses or contact lenses, could have been treated similarly in the ancient world. Thanks to a grant from the Association for the History of Glass, I have been able to undertake a preliminary investigation into this subject that incorporates a survey of the ancient literary and documentary evidence, and a study of several ancient glass lenses.

Roman glass lens © Jane Draycott

So far I have found records of ten glass lenses recovered through archaeological excavation at various sites dating to the Roman period in Egypt, and in time I hope to be able to examine all of them to establish whether they were used as we might use a magnifying glass, glasses or contact lenses, or whether they served a different purpose in ancient ophthalmological and medical practice.

Several Roman writers acknowledge that it was possible to increase the size of an image by utilising a glass lens. Strabo, writing in the late first-century BC and early first-century AD, says 'the visual impression of the size of the sun increases alike both at sunset and sunrise on the seas, because at those times a greater amount of vapour rises from the water; that is, the visual rays, in passing through this vapour as through a lens, are broken, and therefore the visual impression is magnified' (*Geog*. 3.1.5). Seneca, writing in the mid first-century AD, states that 'apples seen through glass appear much larger than they really are' (*Nat. Quest*. 1.3.9), and subsequently reiterates this, 'every object much exceeds its natural size when seen through water. Letters, however small and dim, are comparatively large and distinct when seen through a glass globe filled with water' (*Nat. Quest*. 1.6.5). Two lenses discovered in a house at Tanis (British Museum inv. 27639; British Museum inv. 22522), each with an estimated magnification of x2.5, seem to have been discovered in conjunction with blank cameos, gems and carving equipment, and this has resulted in the suggestion that glass lenses were tools used by artisans, as a means of magnification to assist them in the production of finely carved cameos and gems. If gem-carvers were using magnifying glass lenses for fine work, it is possible that other types of artisans, professional scribes, or even high status individuals such as Seneca did likewise.

While this offers a plausible explanation for the way in which the two lenses discovered at Tanis could have been used, what about all the others? With regard to three lenses discovered in tombs at Hawara (Manchester Museum inv. 2090; University College London inv. 16764; University College London inv. 16765), William Flinders Petrie experimented with them and determined that they had more likely been used to direct light to as to see objects from a distance, rather than for close work such as gem carving (Petrie 1889).

Alternatively, Dimitris Plantzos suggested that coloured lenses could have been used as a means of soothing strained eyes, drawing on Pliny the Elder, writing in the late first-century AD, who stated that 'even after straining our sight by looking at another object, we restore it to its normal state by looking at a '*smaragdus*'; and the engravers of gemstones find that this is the most agreeable means of refreshing their eyes, so soothing to their feeling of fatigue is the mellow green colour of the stone' (*Nat. Hist.* 37.6) (Plantzos 1997). He also noted that numerous ancient writers recorded the role of glass in kindling fires, whether accidentally or on purpose, again drawing on Pliny the Elder, who observed that 'I find that among doctors there is considered to be no more

effective method of cauterising parts that need such treatment than by means of placing a crystal ball so placed as to intercept the sun's rays' (*Nat. Hist.* 27.29). So perhaps some glass lenses could have been used by physicians to cauterise wounds, or even surgical incisions.

I intend to continue my research into the use of glass lenses in Egypt during the Roman period, and would appreciate being apprised of the whereabouts of any other examples of ancient Romano-Egyptian glass lenses.

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Purple Window Glass — accident or design?

David Dungworth

Figure 1: Window 41 from Walmer Castle showing pink/ purple glass attributed to Earl Liverpool (1806–1828)
© David Dungworth

Recent research into historic window glass has been carried out to establish how raw materials and batch recipes have changed over time and how this can be used to date manufacture (Dungworth 2011; 2012). A programme of non-destructive, *in situ* analysis of the windows at Walmer Castle, Kent succeeded in identifying numerous phases of glazing (Dungworth and Girbal 2011). Possibly the most interesting windows at Walmer Castle are the purple or pink windows (Figure 1) attributed to the period when the Earl of Liverpool was the Warden of the Cinque Ports (1806–1828).

It is often assumed that the purple colour of historic window glass is not an original feature of the glass but has developed over time (Abd-Allah 2009). Manganese has often been added in small quantities to glass to counteract the colouring effect of iron ("glassmaker's soap"). The manganese acts on the colour of the glass in two ways: firstly to affect the oxidation of the iron (and the colour it produces) and secondly to contribute a pinkish colour to balance the blue-green of the iron. Decolourising with manganese appears to be most effective when the glass contains roughly twice as much manganese as iron (Dungworth and Brain 2005, fig 8). The manganese is usually added as MnO_2 and much of this will be reduced to Mn_2O_3 or MnO in the glass.

While such glass may be colourless when made, prolonged exposure to sunlight often gives rise to a purple colour. The phenomenon was noted as early as 1825 by Michael Faraday (Tyndall 1870) and was investigated empirically by Gaffield (1867) and Pelouze (1867). It is generally accepted that UV light causes the oxidation of the manganese, giving rise to the purple colour. The pink and purple glass in the windows at Walmer Castle, however, contain an excess of manganese — $MnO:Fe_2O_3$ ratios of 4.4 and 7.5, respectively (see Table 1). It is clear, therefore that the Walmer windows have always had the colours they current have and that sunlight has made little or no contribution to their colour.

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Table 1. Average chemical composition of potash-lime glass from Walmer Castle (pXRF analysis, no data available for sodium)

	Na_2O	MgO	Al_2O_3	SiO_2	K_2O	CaO	MnO	Fe_2O_3	As_2O_3
colourless	NA	<1.5	0.9	71.4	6.1	5.6	<0.01	0.15	<0.02
pink	NA	<1.5	<0.5	67.3	17.9	10.5	0.35	0.08	0.79
purple	NA	<1.5	<0.5	71.9	15.1	9.4	0.97	0.13	0.70

Cogola and all that stuff

Michael Noble

I was interested to see the name 'Cogoli' appear several times in David Watts and Cesare Moretti's recently published book 'Glass Recipes of the Renaissance.' We are told that 'Cogolis' were *'quartz pebbles collected from the shore of the river Ticino and also from the river Adige (Verona)'* and used in Murano as a source of silica from the fourteenth to the eighteenth-century.

Coincidentally a reference to Cogola turned up recently when I was examining an early Chancery Law Suit, Bowes v. Salter [E 133/25/21] in the National Archives, as part of my own investigations into early glass production. As this was dated 1608 it must be one of the earliest, if not the earliest, direct reference to glassmaking materials in this country, and I thought readers of the book might also be interested in this information.

Sir Jerome Bowes had been granted a patent in about 1595 for the *'making of drinking glasses or other glasses whatsoever like unto such as be most used made or wrought in the said town of Morano…'* for which a glasshouse in the old Blackfriars monastery had been erected.

Sir Edward Salter on the other hand had been granted a patent in 1608 to *'set up and put in use the art and feat of making of all manner of drinking glasses and other glasses and glassworks whatsoever of the fashions stuff matter or metals now used made or wrought in the said town or city of Murano near Venice*…[which was]*…not prohibited, restrained, or forbidden in or by the said several letters patent…made unto the said Sir Jerome Bowes.'* This he did at Winchester House in Southwark, and to help start the business brought over workmen from Italy, probably in the same year.

The person running the Blackfriars glasshouse on behalf of Bowes was William Robson and his associates. They were concerned at the time that this new glasshouse was possibly infringing their own earlier patent, so much so that they took out a law suit on behalf of Bowes against Sir Edward Salter.

The record of the proceedings in the National Archives contains five parchments in which one poses what questions should be asked by the court; the other four give depositions of two Winchester House workmen Francisco Butso and Simon Favaro. *'Fransisco Butso Bratso'* was described as '*an Italien of Murano, glassmaker'* while Simon Favaro, also a glassmaker from Murano, was referred to as *'first taser'* in his deposition.

The second question posed by the court, and that most specific to raw materials, asked '*What stuff do they principally use in making glasses in the said furnace in Southwark? and by what name is the same stuff called? What do they add and put to the same stuff to make the metal fit for glassmaking? And by what name and names is that called which they add to the same stuff? Whether is the stuff principally used for glassmaking in Murano such and so called as that which is used to the same purpose in Southwark, yea or no? And by what name is the same stuff principally used in Murano called? What do they in Murano add and put to their stuff to make their metal for glassmaking? And by what name or names is that called which they in Murano add to their said stuff? And is the stuff metal and glasses made in the Black Friars like to such as are most used made or wrought in the town of Murano, yea or no?'*

In answer Francesco Butso states that *'the principal stuff where of the glasses made in Southwark as are made is called soad wherewith they mingle sand, and to give him colour safra and manganese, of being several kinds of earthen stone. And he further saith that the stuff which they make glasses in Murano is called cinera…to which cinera they add in Murano* ***cogala*** *using stones like unto pebbles being beaten to powder, as safra* [zafra] *and manganese.'* Simon Favaro gives a similar testimony in which he states that two kinds of soda were being used into which they added sand, manganese and safra, and

although this document was particularly difficult to transcribe, having obviously been written by an interpreter with many deletions, rewriting and alterations, the basic content can clearly be discerned.

Of additional interest here is the reference to the use of sand as the source of silica. Dossie, in his Handmaid to the Arts of 1758, writes [p.253] *'Flint glass, as it is called in our country, is of the same general kind with what is in other places called crystal glass. It had this name from being generally made with calcined flints, before the use of the white sand was understood.'* The implication here was that the older glasshouses used flints rather than sand for their fine glass, which from the above depositions was obviously not the case.

Although neither Butso nor Flavaro could give an account of the materials being used in the Blackfriars glasshouse they were presumably the same 'stuff,' with sand being the source of silica, 'soda of two sorts' providing the alkali or flux, and manganese and safra being used as decolourising agents.

The types of wares made at Winchester House, according to Butso, were *'plate, cruets, salts and stills, until about some fourteen or fifteen days now last past since which time there hath been made there certain kind of glasses called trunk and mortar glasses.'* He goes on to say that *'the glasses that are most ordinary used made and wrought in Murano are sometime short legged, sometime long, or with ears of diverse fashion, but he hath not known any such glasses ordinarily used, made, wrought in Murano, as these which he hath described to be made in Southwark,'* and that the *'trunk and mortar glasses are not like to such drinking glasses as are most used, made or wrought in Muran, unless they be bespoken.'*

Although the outcome of the Chancery Suit does not appear to be recorded, the glasshouse was to remain in production for many years. It was even involved in the development of a coal fired furnace, to be used as an alternative to the traditional wood burning furnaces which were then commonly in use. In *Metallica* by Simon Sturtevant published in 1612 there is the statement that *'very lately, by a wind-furnace, greene glasse, for windowes, is made as well with pit-coale at Winchester House in Southwarke as it is done in other places with much wast & consuming of infinite store of billets and other wood- fuel.'* This was the start of a patent granted initially to Sir Edward Zouch and others in 1611 for the manufacture of glass using coal, which would result in the eventual elimination of wood burning furnaces.

If anyone would like more information on the documents, or would like to receive an image of them, please contact me at: mikenoble1@btinternet.com

The Middle Saxon Glass from SOU 1553

Genni Elliott

Matthew Garner of Southampton City Council Archaeology Unit reports that evidence of glassworking, as well as an assemblage of vessel glass, has been found at a site in Hamwic (SOU 1553). Fieldwork is continuing at the site as part of a watching brief. This description of the glass recovered is from a report by Genni Elliott kindly made available to Glass News.

Vessel Glass

52 fragments (59g) of Middle Saxon vessel glass were found, including 14 rims, 4 bases, 2 decorated body sherds, and 32 non-diagnostic body sherds. All of the rims and bases were of the palm cup / funnel beaker series, and the non-diagnostic sherds could all have come from the same type of vessels. There was no evidence for the more unusual vessel types known from Hamwic such as squat flasks or jars, bowls or tall beakers, but there was a small sherd of red glass which is a rare colour in Middle Saxon glass (Hunter and Heyworth 1998, 35). Most of this was from an exceptionally large rubbish pit on the site, of which only a quarter was excavated – the rest was left *in situ* beneath the new building. This pit also provided four of the six *sceattas* recovered from the site.

The range of colours was typical of that found in Hamwic, with the majority being pale green to pale blue with the one red sherd with yellow decorative trails (item 153). Six sherds were decorated (four rim and two body) consisting of yellow trails on the body of two sherds, marvered yellow trails on three sherds and self-coloured marvered trails on one sherd.

Linen Smoother

A curved sherd of a hollow blown glass linen smoother (item 32) was found amongst the glass vessel sherds in pit 301. It was in pale blue glass and had a wall thickness of 4mm. There are late seventh-century examples of bun-shaped linen smoothers (of which this may be an example), either as a solid lump of glass or a hollow flattened bubble (Macquet 1990). Both types are known from Birka (Arwidson 1984) and Dorestad (Isings 1980). Hollow examples from Middle Saxon sites in England include Brandon in Suffolk, Covent Garden in London,

Barking Abbey (founded AD 675) in Essex, and Bedfordbury (Evison 1991).

Glass working

Two joining sherds of a pottery vessel used to melt glass © Matt Garner

Two joining sherds of the base of a Middle Saxon imported whiteware pottery vessel showed evidence of being used to melt glass. They were recovered from a site layer, which also produced two large fragments of Roman brick, one of them burnt. Similar examples of glassy deposits in imported pots have been found on other sites in Hamwic such as SOU 33 east of St Mary's Church, SOU 169 at Six Dials (Andrews 1997, 217) and at St Mary's Stadium (Birbeck 2005, 137). Glassy residue on a pottery sherd was also found at SOU 514, only some 5m from the SOU 1553 find (Brown 1993, 18). The presence of melted glass at the current site adds to the evidence for glass working within Hamwic at a time when the Middle Saxon glass industry was emerging.

The presence of an imported pot used for the melting of glass is strong evidence for glass working in the vicinity. However the melted glass and the glass vessel sherds need not be contemporary as the pottery associated with the melted glass indicates an early phase of the Middle Saxon period with high quantities of fabric Groups 1, 2, and 3 (Timby 1988, 112), whereas pottery associated with the sherds in pit 301 includes fabric Groups 4 and 5, which are considered to be late in the Middle Saxon sequence (*ibid*, 114).

For more information, contact Matt Garner (Matthew.Garner@southampton.gov.uk).

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QUERY

Alison Maddock writes: I am hoping that someone in the AHG might be able to advise me on the disposal of some unprovenanced glass items which came into my possession when I was a child. They are two sets of worn glass beads, one set of dull turquoise and green colours labelled 'Ancient Egyptian 1500BC' and the other reddish-brown and labelled 'Celtic 100-500BC' (diameters from about 2mm to 1cm). There is also a small cube of red glass labelled 'Copy of glass found in the tomb of Tutankhamun'. They were samples from the glass collection of Sir Herbert Jackson (1863-1936)

eminent chemist and metallurgist whose work included Egyptian glass technology, I believe. I recently consulted the curator of Egyptology at Bristol Museums, who doubts the date of the beads, suggesting that if they are Egyptian then they are of late date. The similarity of the 'Celtic' beads, apart from their colour, may suggest a similar origin, which could perhaps have been elsewhere in the Near East. Clearly they are of no archaeological use now, but would any member like to have them for research, analysis or practice purposes? Perhaps there is even someone who knows where Jackson sourced his material.

If you can provide any information about these objects please contact the editors (see back page)

NEWS

Glastonbury Abbey excavations reveal Saxon glass industry

New research led by the University of Reading has revealed that finds at Glastonbury Abbey provide the earliest archaeological evidence of glass-making in Saxon Britain. Professor Roberta Gilchrist, from the Department of Archaeology, has re-examined the records of excavations that took place at Glastonbury in the 1950s and 1960s.

Glass furnaces recorded in 1955-7 were previously thought to date from before the Norman Conquest. However, radiocarbon dating has now revealed that they date approximately to the 680s, and are likely to be associated with a major rebuilding of the abbey undertaken by King Ine of Wessex. Glass-making at York and Wearmouth is recorded in historical documents in the 670s but Glastonbury provides the earliest and most substantial archaeological evidence for glass-making in Saxon Britain.

The extensive remains of five furnaces have been identified, together with fragments of clay crucibles and glass for window glazing and drinking vessels, mainly of vivid blue-green colour. It is likely that specialist glassworkers came from Gaul (France) to work at Glastonbury. The glass will be analysed chemically to provide further information on the sourcing and processing of materials.

An exhibition at Glastonbury Abbey Museum, 'From Fire & Earth', tells the story of the Abbey's pioneering role in medieval crafts and technology, and runs until 16th September 2012.

Coventry Cathedral's medieval stained glass

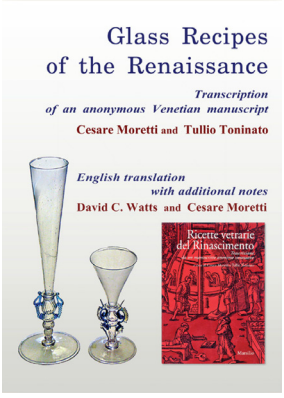
Repairs to the ruins of the medieval Coventry Cathedral is now a World Monuments Fund Britain major project. Funding has been secured for urgent repairs to the worst affected part of the structure, and also to pay for 60% of the cost of the repair and cleaning of the collection of outstanding stained glass which was salvaged from the building a year before it was severely damaged by bombing during WWII. Work on the glass, which has been in storage for 70 years, will be undertaken by the University of Lincoln's conservation faculty at Coventry's Herbert Art Gallery and Museum where the public can gain access to view the work in progress from August to October this year. Among the glass are many examples of John Thornton's style; he was a master glazier based in Coventry in the early fifteenth-century who also worked extensively at York Minster – as those who attended the AHG meeting there last year will recall.

A feature on the glass can be found at: http://vidimus.org/issues/issue-33/features/ in Vidimus, the on-line magazine on medieval glass that can be subscribed to free of charge.

There are further pictures of the glass at: www.bbc.co.uk/news/ub-england-coventry-warwickshire-15694422

BOOK REVIEW

Glass Recipes of the Renaissance. Transcription of an anonymous Venetian manuscript
Cesare Moretti and Tullio Toninato



English translation with additional notes
David C Watts and Cesare Moretti

Watts Publishing, 2011£15 plus £3.50 p+p from David Watts, 27 Raydean Road, Barnet EN5 1AN
ISBN 978-0-9562116-1-3

This is David Watt's (with the assistance of Cesare Moretti) translation of a Venetian glassmaking recipe book dated to *c.*1560, which was published in Italian in 2001 by Moretti and Toninato. The manuscript came to light in preparations for the 1982 exhibition

Glassworking Art of Murano. It dates to a fundamentally important period of Venice's glassmaking, and can be placed chronologically between a recipe book of 1536 preserved in Montpellier, and Neri's *L'Arte Vetraria* of 1612. The book is divided into two parts: Discussion and The Recipes. There is a small number of well-chosen illustrations.

This 'anonymous recipe book' is an instruction manual for an apprentice, with very detailed instructions. It includes the ingredients for different types of glass, the equipment and methods, various colours and enamels, and the manufacture of mosaics (including those with silver and gold foil) and paternosters. In addition to the recipes, other glimpses into the lives of sixteenth-century Venetian glassworkers are touched upon. A number of glassworkers are mentioned, and the price that a vase made of a particular type of *calcedonio* was sold for. It reminds us of the clandestine nature of the Venetian glass industry with comments like 'this is a secret to hide' and 'this is a secret that only I know and Anzolo of the Serena'. (The inclusion of tartar in the recipe suggests that the salts must have contained a mixture of sodium and potassium, and it is suggested by the authors that this may have been the 'secret', which was common knowledge amongst glassmakers, but kept from the Venetian Council, who decreed that only pure soda glass could be made).

Neri's 1612 recipe book and manual has previously been the only such source available in an English translation, although always thought likely that it derived from earlier manuscripts. The discovery of this new manuscript led to a detailed comparison by Moretti and Toninato with five other known texts dating between the fourteenth-century and 1644. The instructions of this recipe book are 'simpler and clearer' than some such as Neri. It uses some ingredients and methods that differ from those in other manuals. For examples, there is the first documented mention in Venetian glassworking of antimony as an opacifier, although it is likely that it was in use from the fifteenth-century. There are other points that the different sources do agree on, such as the management of the furnace.

This is a deeply researched and valuable volume, with thorough comparison and discussion by Moretti and Toninato, as well as additional notes by David Watts, which include further insights and references to more recent publications and research. The discussion takes the form of listing what each different source says about each glassmaking instruction, and perhaps a summary of the most relevant points, those that 'revolutionise the understanding of … the early processes of glassmaking' would be useful. It is quite technical for a general readership, and works best when researching a specific point. The recipes are certainly worth translating for a wider audience; they are clearly presented and give a direct link to the workshop of the Venetian glassmaker. Scholarship in glass studies relies on the sharing of information, and David Watts has done those of us who are not fluent in Italian a great service, and at an extremely reasonable price.

Rachel Tyson

Please send your contributions:
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for *Glass News* **33**
by

30th November 2012

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