

4th International Symposium

The Multiple Lives of Glass

Historical perspective on recycling (Antiquity-1960)

Orléans – 3, 4 and 5 June 2027



Le Ramasseur de verre, 1907, AD Hérault 2 Fi CP 1203 Béziers



Stock de verres brisés d'un atelier de mosaïque ©S.Lagabrielle

Overconsumption and the promotion of disposables have made our societies aware of the major need to recycle (Monsaingeon). But what does the term 'recycle' actually mean? According to *Recyclage*, the French Academy defines "the action of processing a substance or product that has already been used in order to allow its reuse." Both raw material and a product, glass opens the field of possibilities. In the very process of its manufacture, glass requires the addition of broken glass, that is to say, the "recovery of raw materials" (recycling), and, as shaped glass, it undergoes a "lateral recycling" (lateral cycling; reusing), which implies a possible change of hands, without alteration of form or function (Schiffer, Smail et al.). But alongside these two lives, the glass object can be "recovered" and give rise to other uses not originally envisaged which, most often, involve a change in form and substance. Indeed, it allows, in a more unexpected ontological cycle, the practice of 'a different use or repurposing' (Schiffer, Smail et al., Hay, Chini).

If current European regulations take glass recycling into account, and if glass is indeed recognized in people's minds, the history of glass recycling deserves a comprehensive specific study that highlights its recycling qualities, both early (cullet/cullet enters the production chain from the very beginning), infinite, and lateral. In the past twenty to thirty years, pioneering and decisive work in archaeometry has advanced knowledge of glass recycling during Antiquity and the Early Middle Ages, and beyond, whether in the Near and Middle East, in the West (Freestone, Ceglia, Pactat), in Africa, or in the Indian Ocean (Dussubieux, Craig, Schibille). They emphasized the originality of the blue glass circuit (Whitehouse, Velde, Gratuze, Billegaray), as well as the mastery of recycling in Venice (Verità & Biron). Rich articles, most of them old, have, for their part, provided information on the domestic and inventive reuse of bottles and flasks in the New World and on the organization of their collection by industrialists, from the 18th century to the mid-20th century (Busch, Stuart). In this type of practice, the case of Europe has only been superficially addressed.

Also, several new perspectives could be considered to examine the multiple lives of glass, regardless of the orientation and type of production envisioned (precious glass, colored glass, containers, common or high-quality glass, glazing or stained glass...).

- The study of compositions encourages both a confrontation with the "recipes" and treatises of the time, as well as the identification of spatial-temporal markers and the detection of periods of transition. Attention will be given to the proportion of recycled glass and its impact on fuel management, on the quality of crucibles, the rendering of colors, the homogeneity of the glass...
- To contextualize the areas and circuits, we will focus on the circulation of broken glass, which involves the organization of a collection, a maritime, river, and land route, regulations and taxes (duties, tolls, etc.), and economic management (transaction costs, market value, etc.). We will take into account the various actors in recycling (large landowners, religious or secular institutions, craftsmen, etc.).
- Storage locations deserve detailed analysis, whether it concerns a cargo, an urban or rural area, a public/religious complex, a workshop, or a domestic dwelling. Inside the premises, much information can be collected about the type of storage (in bulk, amphora, barrel, basket, etc.), the volume occupied, its weight and nature (lamp, dishware, glazing, mosaic, etc.) and its possible sorting (size, color, quality, etc.).
- The reuse of bottles and flasks (wines, beers, spirits, sodas, medicinal potions...) has been observed at various discovery sites (industrial, commercial, domestic, maritime, colonial sites...). The marks provide evidence of initial use (stamps, labels, wear marks...) and inform about the type of objects recycled, whether they were reused individually or through an organized deposit system, and also about their users (activity, social level, gender... of the holder). They can reveal a time of economic tension and more autonomous organization.
- In the latest studies on the history of architecture, glass has been barely or not at all considered (Arnoux 2024; Bernardi & al, 2018 and 2024). However, the archives do mention "new glass" and "old glass," which implies the involvement of craftsmen, changes in size, reserved secondary locations, a certain value, or, conversely, a downgrade of the reused glazing.
- For certain glass objects, reuse can become "enhancing." This is demonstrated by archaeological discoveries of funerary vessels, holy water flasks, reliquaries, smoothing tools with prophylactic virtues, the preservation of "beautiful stained-glass windows"... Any sign of wear, breakage (Chinni), any addition of mounting elements, lids, and other devices on the artifact unearthed or on the object preserved in church treasuries (George) are all indications that add to the interest of the discovery sites and textual sources.
- Finally, musical glasses (Benjamin Franklin's Glass Harmonica, 18th century; Cristal Baschet from the 1950s...), silvered glasses from collectors, or other original artistic creations, do they attest to a "recycling that transforms replaceable and replaced objects into irreplaceable objects" (Demoule).

Bibliography

General Information

Mathieu Arnoux, *Un monde sans ressources. Besoin et société en Europe (xi^e-xiv^e siècles)*, Paris, Albin Michel, 2023.

Philippe Bernardi, Robert Carvais, Valérie Nègre (éds.), *Recyclage et emploi : la seconde vie des matériaux de construction*, *Ædificare* Revue internationale d'histoire de la construction, 2, 2018, n° 4.

Charles Delattre, *Objets sacrés, objets magiques : de l'Antiquité au Moyen Âge*, Paris, Picard, 2007.

Jean-Paul Demoule, « Archéologie, Art contemporain et recyclage des déchets, Objets irremplaçables », *Techniques & Culture* 58, 2012/1, p. 160- 177.

Philippe George, « Définition et fonction d'un trésor d'église », *Bulletin du centre d'études médiévales d'Auxerre*, 9, 2005.

Michel Lauwers, « Déposer, cacher, fonder. À propos de quelques formes de dépôt rituel dans l'Occident médiéval », in Sandrine Bonnardin, Caroline Hamon, Michel Lauwers et Bénédicte Quillec, *Du matériel au spirituel. Réalités archéologiques et historiques des « dépôts » de la Préhistoire à nos jours*, Actes des Rencontres, 16-18 octobre 2008, XXIXe Rencontres internationales d'Archéologie et d'Histoire d'Antibes, éd. APDCA, Antibes, 2009.

Baptiste Monsaingeon, *Homo detritus*, Paris, éd. Points (collection « Terre »), 2020.

M. B. Schiffer, *Formation processes of the Archaeological Record*, Albuquerque, University of New Mexico Press, 1987.

Daniel Lord Smail, Gabriel, H. Pizzorno, Nathaniel Hay, « Recyclage et ontologie de l'objet dans les textes du Bas Moyen Âge : l'exemple de Marseille », in Yves Henigfeld, Philippe Husi, Fabienne Ravoire, (eds.), *L'objet au Moyen Âge et à l'époque moderne : Fabriquer, échanger, consommer et recycler*. Actes du XIe congrès de la Société d'archéologie médiévale, moderne et contemporaine (28-29 mai 2015, Bayeux), Caen, PUC, 2020, pp. 393-401.

Recycling and Production

Anna-Isabelle Bidegaray and Alan Mark Pollard, "Tesserae Recycling in the Production of Medieval Blue Window Glass", *Archaeometry*, 2018, vol. 60-4, p. 784-796.

Isabelle Biron, Pete Dandridge, and Mark T. Wypyski, "Techniques and Materials in Limoges Enamels," in *Enamels of Limoges, 1100-1350*, ed. John P. O'Neill, New York: The Metropolitan Museum of Art, 1996, p. 48-62.

Anne-Françoise Cannella, *Gemmes, verre coloré, fausses pierres précieuses au Moyen Âge, Le quatrième livre du "Trésorier de Philosophie naturelle des pierres précieuses" de Jean d'Outremeuse*, Genève, Droz, 2006.

Andrea Ceglia, Peter COSYNS, Nadine Schibille, Wendy Meulebroeck, "Unravelling provenance and recycling of late antique glass from Cyprus with trace elements", *Archaeological and Anthropological Sciences*, 2019, vol. 11, p. 279-271.

Ricardo Córdoba de la Llave, 'Recycling of materials and reuse of production Labor residues in Late Medieval Europe/Reciclaje de materiales y reutilización de residuos de Labores Productivas en la Europa Bajomedieval', Universidad de Córdoba, *Anuario de Estudios Medievales* 52/1, enero-junio 2022, p. 185-207.

Jennifer Craig, 'Project Gallery. Refining the chronology and distribution of mid-fifteenth to mid-seventeenth century Indian Ocean world glass', *Antiquity* 2021, p. 1-6.

Laure Dussubieux & M. Wood, 'Indian glass: chronology and distribution in Eastern Africa', in Alok Kumar Kanungo & Laure Dussubieux (ed.), *Ancient glass of south Asia: archaeology, ethnography and global connection*, p. 511-532.

Danièle Foy, Marie-Dominique Nenna (dir.), *Echanges et commerce du verre dans le monde antique*, Actes du colloque de l'Association française pour l'Archéologie du verre, Aix-en-Provence et Marseille, 7-9 juin 2001, *Monographies Instrumentum* 24, Montagnac, 2003.

Ian. C. Freestone, 'The recycling and reuse of Roman glass: analytical approaches', *Journal of Glass Studies* 57, 2015, p. 29-40.

María Auxiliadora Gómez-Morón, Teresa Palomar, Luis Cerqueira Alves, Pilar Ortiz, Márcia Vilarigues et Nadine Schibille, 'Christian-Muslim contacts across the Mediterranean: Byzantine glass mosaics in the Great Umayyad Mosque of Córdoba (Spain)', *Journal of Archaeological Science*, 2021, 129, p. 105-370.

Bernard Gratuze, Isabelle Soulier, Jean Noël Barrandon, Danielle Foy, « De l'origine du cobalt dans les verres », *Revue d'Archéométrie*, 16, 1997, p. 97-108.

Bernard Gratuze, Catherine Guerrot, Danièle Foy, Adrien Arles, Florian Téreygeol, « Les galets de verre au plomb carolingiens issus des scories de Melle : élaboration et distribution », in *Mine, métal, monnaie. Autour du cas de Melle, les voies de la quantification de l'histoire monétaire du haut Moyen Âge*, Sep 2011, Paris, France.

Bernard Gratuze, Nadine Schibille, Inès Pactat, 'Glass in the Middle East and Western Europe at the End of the First Millennium CE, Transition from Natron to Plant Ash Soda or Forest Glasses', in Alok Kumar Kanungo, Laure Dussubieux (ed.), *Ancient Glass of South Asia*, Singapore, Springer, 2021, p. 21-38.

Caroline. M. Jackson, S. Paynter, 'Great big Melting pot: Exploring patterns of Glass Supply, Consumption and Recycling in Roman Coppergate, York', *Archaeometry*, Volume 58, Issue 1, February 2016, p. 68-95.

Inès Pactat, « Le Recyclage du verre au temps des Romains, des Francs et des Byzantins », *Reflets de la physique, Dans les reflets du verre*, n° 74, p. 16-21.

Sarah Paynter & Caroline Jackson, 'Re-used Roman Rubbish: a thousand years of recycling glass', *Post-Classical Archaeologies* 6, 2016, p. 31-52.

Alberta Silvestri, Gianmario Molin, Gabriella Salviulo, Renzo Bertoncello, 'The Coloured Glass of Iulia Felix', *Journal of Archaeological Science*, 2008, vol. 35, p. 1489-1501.

Dominique Simon-Hiérnard, Bernard Gratuze, « Le vase de Saint-Savin en Poitou et les verres médiévaux bleu-cobalt à décors blancs », *Bulletin de l'Association française pour l'archéologie du verre*, 2011, p. 69-99.

Isabelle Soulier, Bernard Gratuze, Jean Noël Barrandon, 'The Origin of Cobalt Blue Pigments in French Glass from the Thirteenth to the Eighteenth Centuries', in *Trade and Discovery: The Scientific Study of Artefacts from Post-Medieval Europe and Beyond*, ed. Duncan R. Hook and David R. M. Gaimster, British Museum Occasional Paper 109, London: the museum, 1995, p. 123-133.

Bernard Gratuze, Catherine Guerrot, Danielle Foy, Justine Bayley, Adrien Arles, Florian Téreygeol, « Melle : mise en évidence de l'utilisation des scories vitreuses issues de la chaîne opératoire de production de l'argent comme matière première de l'industrie verrière », in Florian Téreygeol (dir.), *Du monde franc aux califats omeyyade et abbasside : extraction et produits des mines d'argent de Melle et de Jabali*, Bochum, Selbstverlag des Deutschen Bergbau-Museums, 2014, p. 211-230.

Nadine Schibille, Allison Sterrett-Krause, Ian C. Freestone, "Glass groups, glass supply and recycling in late Roman Carthage", *Archaeological and Anthropological Sciences*, 2017, vol.9, p. 1223-1241.

Alberta Silvestri, Gianmario Molin, Gabriella Salviulo, Renzo Bertoncello, 'The Coloured Glass of *Iulia Felix*', *Journal of Archaeological Science*, 2008, vol. 35, p. 1489-1501.

Elise Vanriest, « Le métier de patenôtrier boutonnié d'émail à Paris au XVI^e siècle », *Bulletin de l'Association française de l'Archéologie du Verre*, 2016, p. 92-94.

Bruce Velde, "Les Vitraux bleus et sodiques du XII^e siècle", *Bulletin de l'Association Française pour l'Archéologie du Verre*, 2004, p. 25-27.

Marco Verità and Isabelle Biron, 'Analytical Investigation of Genuine Renaissance Venetian Enameled and Gilded Glass', *Journal of Glass Studies*, vol. 63, 2021, p. 157-196.

Line Van Wersch, Laurent Verslype, David Strivay, Frans Theuws (Ed.), *Early Medieval Tesserae in Northwestern Europe*, Bonn, Habelt-Verlag, 2019.

David Whitehouse, "Glass in the Epigrams of Martial," *Journal of Glass Studies*, v. 41, 1999, p. 73-81.

Marilee Wood, 'Divergent patterns in Indian Ocean trade to East Africa and southern Africa between the 7th and 17th centuries CE: the glass bead evidence', in Thomas Vernet et Philippe Beaujard, *L'Afrique orientale et l'Océan Indien : connexions, réseaux d'échanges et globalisation (I^{er} millénaire - XIX^e siècle, Afriques. Historical debates, methods and fields* 6, 2015.

The "Second Life" of Glass

Jane Busch, 'Second Time Around: A Look at Bottle Reuse', *Historical Archaeology*, 1987, vol. 21, no 1, p. 67-80.

Tania Chinni, Alberta Silvestri, Sara Fiorentino and Mariangela Vandini, 'Once upon a Glass—Cycles, Recycles and Reuses of a Never-Ending Material', *Heritage*, 2023, 6, p. 662–671.

Francesca Dell'Acqua, 'Ninth-Century Window Glass from the Monastery of San Vincenzo al Volturno (Molise, Italy)', *Journal of Glass Studies* 39, 1997, p. 33-41.

Chloë N. Duckworth, Andrew Wilson (Eds.), *Recycling and Reuse in the Roman Economy*, Oxford University Press, Oxford (UK), 2020.

Kenneth B. Farnsworth, John A. Walthall, 'Bottled in Illinois. Embossed Bottles and Bottled Products of Early Illinois Merchants from Chicago to Cairo, 1840–1880', *Studies in Archaeology*, no. 6, Illinois State Archaeological Survey, University of Illinois, Urbana (Illinois), 2011.

Danielle Foy, « Recyclages et réemplois dans l'artisanat du verre. Quelques exemples antiques et médiévaux », dans Pascale Ballet, Nadine Dieudonné-Glad, Pierre Cordier (éd.), *La ville et ses déchets dans le monde romain : rebuts et recyclages*, Éditions Mergoïl, 2002, p. 271-276.

Danielle Foy, Gabrielle Démians d'Archimbaud, « Dépôts de verres et rites funéraires », in *Archéologie du cimetière chrétien*, actes du 2e colloque A.R.C.H.E.A. (1994), 11e supplément à la *Revue Archéologique du Centre de la France*, Tours, 1996, p. 225-241.

Catherine Hébrard-Salivas, "Etude de la verrerie du site de Pey-Berland (Bordeaux)", *Bulletin de l'Association française pour l'archéologie du verre*, 2011, p. 79-84.

Daniel Keller, "Social and economic aspects of glass recycling", *Theoretical Roman Archaeology Journal*, 2004, Oxford, Oxbow Books, 2005, p. 65-78.

Tom Licence, 'Normalising bottle reuse: Lessons from the Victorians on the limits of voluntary schemes', 30 January 2020 <https://research-portal.uea.ac.uk/en/publications/normalising-bottle-reuse-lessons-from-the-victorians-on-the-lim>

Catherine Losier, « Bouteilles et flacons : Les Contenants utilitaires français du début du XVIIIe siècle au début du XIXe siècle. Aspects techniques et sociaux », *Journal of Glass Studies*, vol. 54, 2012, p. 151-180.

Nicolas Marty, *L'invention de l'eau embouteillée : qualités, normes et marchés de l'eau en bouteille en Europe, XIXe-XXe siècles*, Bruxelles, P.I.E. Peter Lang, 2013

Beth Munro, Recycling, 'Demand for Materials, and Landownership at Villas in Italy and the Western Provinces in Late Antiquity', *Journal of Roman Archaeology*, 2012, 25, p. 351–370.

Iain Stuart, 'Bottles For Jam? An Example of Recycling from a Post-Contact Archaeological Site', in *Australian Archaeology*, June 1993, n° 36, p. 17-21.

Recyclage et détournement

Association Structures sonores Baschet, en ligne www.baschet.org

Christophe Baillet, « Usages du verre dans les trésors ecclésiastiques de reliques (sud-ouest de la France, fin XIe-début XVIIIe s.) », *Bulletin de l'Association Française pour l'Archéologie du Verre*, 2013, p. 135-141.

Audrey COUINEAUX, *Modélisation vibro-acoustique du cristal Baschet : jouabilité et timbre du son produit par frottement*, Laboratoire d'Acoustique de l'Université du Mans / LAUM, Nantes université, Sciences de l'ingénierie et des systèmes Le Mans, 2024.

Mélanie Traversier, *L'Harmonica de verre et miss Davies. Essai sur la mécanique du succès au siècle des Lumières*, Paris, Le Seuil, 2021.

Jean Claude Chapuis, *Glass Harmonica et autres instruments de verre*, Les éditions de l'œil, 2017.

Proposals will be sent to
sophie.lagabrielle@orange.fr
michel.philippe@hotmail.fr
before October 1st 2026

Scientific committee

Marie-Dominique Nenn, directeur de recherche CNRS (à confirmer)
Catherine Verna, professeur honoraire d'histoire médiévale, Université de Paris 8
Corine Maitte, Professeur d'Histoire moderne, Université Gustave Eiffel, Paris 7
Nicolas Marty, Professeur des Universités histoire contemporaine, Université de Montpellier
Marco Verità, Senior researcher, Stazione Sperimentale del Vetro in Murano
Nadine Schibille, UMR 7065, chercheuse, IRAMAT CEB, UMR 7065 CNRS/Univ. Orléans