

# RESEARCHING THE WORLD'S BEADS: AN ANNOTATED BIBLIOGRAPHY

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## BEADMAKING: TECHNICAL ASPECTS

This section of the bibliography deals with beadmaking technology, ancient and modern, around the world. To facilitate searches, the entries have been assigned to the following categories: Glass; Faience; Metal; Stone; Shell; Eggshell; Bone, Ivory, Antler, and Horn; Seeds and Nuts; and Mixed Materials.

### GLASS

**Agyei, I.K., J. Adu-Agyem, and R. Steiner**

2012 Exploring Traditional Glass Bead Making Techniques in Jewellery. *Journal of Science and Technology* 32(3):103-112.

Discusses the techniques and materials used to produce glass beads in present-day Ghana.

**Ajithprasad, P. and Marco Madella**

2017 Early Harappan Bead Production in Gujarat: Technology, Adaptation and Contacts. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 277-292. Indian Institute of Technology, Gandhinagar.

**Babalola, Abidemi Babatunde**

2015 Archaeological Investigations of Early Glass Production at Igbo-Olokun, Ile-Ife (Nigeria). Ph.D. dissertation. Department of Anthropology, Rice University, Houston.

Describes the deposits (12th-15th centuries) and the recovered materials in significant detail. Using chemical and physical analyses of the glass beads and glass production debris, the competing hypotheses of local primary glass production or re-melting of imported glass to create beads are explored in detail.

**Babalola, Abidemi Babatunde, Susan Keech McIntosh, Laure Dussubieux, and Thilo Rehren**

2017 Ile-Ife and Igbo Olokun in the History of Glass in West Africa. *Antiquity* 91(357):732-750.

The recovery of glass beads and associated production materials from a site in Nigeria has shed light on early glass manufacturing techniques in West Africa between the 11th and 15th centuries AD.

**Babalola, Abidemi and Thilo Rehren**

2016 The 11th-15th Century AD Glass Crucibles from Ile-Ife, Southwest Nigeria. Paper presented at the 23rd biannual Society of Africanist Archaeologist conference, Toulouse, France.  
<https://www.researchgate.net/publication/306017012>, accessed 30 Oct. 2017.

Presents the results of the classification, macro/microstructural, and compositional analyses carried out on glass-working and possibly glassmaking crucibles excavated at Igbo Olokun, Ile-Ife. Drawn-bead production waste was also recovered.

**Babalola, Abidemi Babatunde, Thilo Rehren, Akinlolu Ige, and Susan McIntosh**

2018 The Glass Making Crucibles from Ile-Ife, SW Nigeria. *Journal of African Archaeology* 16:1-29. Provides an in-depth examination of numerous crucible fragments recovered from 11th-15th-century deposits in order to understand the quality of the crucibles, their typology, and their functions in glassworking/making. Compositional analysis of a sample of the thousands of glass beads from the excavations indicates that the crucibles were used to melt the glass used for the beads.

**Basa, Kishor**

1993 Manufacturing Methods of Monochrome Glass Beads in South Asia. *Man and Environment* 18(1):93-100.

1993 A Note on the Drilling Method of Glass Bead Making. *Archaeomaterials* 7(1):53-56. Examination of silicone rubber impressions of the perforations of two Iron Age glass beads from Ban Don Ta Phet, Thailand, shows evidence that they were drilled by lapidary methods more associated with stone beads.

**Bayley, J.**

2003 Glass Bead-Making in Viking York. *Current Archaeology* 16(6)186:252-253. Mentions the use of ceramics as melting plates in the production of glass beads.

**Bellintani, Paolo, Mauro Cesaretto, and Giovanna Residori**

2003 Progetto "I materiali vetrosi nella protostoria dell'Italia del Nord". Archeologia, archeometria, etnoarcheologia e approccio sperimentale. In *Archeologie sperimentali. Metodologie ed esperienze fra verifica, riproduzione, comunicazione e simulazione, Atti del convegno: Comano Terme-Fiavè (Trento, Italy) 13-15 settembre 2001*, edited by P. Bellintani and L. Moser, pp. 311-335. Provincia autonoma di Trento.

Reports on experimental production replication of Bronze Age glass and faience beads found in northern Italy.

**Bertini, Martina, Rajmund Mokso, and Eva M. Krupp**

2014 Unwinding the Spiral: Discovering the Manufacturing Method of Iron Age Scottish Glass Beads. *Journal of Archaeological Science* 43:256-266.

The innovative application of X-ray micro-computed-tomography ( $\mu$ CT) with synchrotron light permitted the identification of characteristic features and markings typical of specific low temperature glass-working techniques, and also added to the evidence for local manufacture.

**Brendle, Tobias**

2005 Glasperlen des frühen Mittelalters. Experimentelle Beobachtungen zur Herstellungstechnik. Bajuwaren Hof Kirchheim, *Jahresschrift* 2004.

Experimental observations on the techniques used to manufacture glass beads during the early Middle Ages.

**Burchell, Alan David**

2018 The Mystery of the Viking Glass Bead Furnaces. Viking Glass Bead Furnaces Used between the 8th-10th Centuries A.D.: Research Into Viking Period Glass Bead Furnaces through Experimentation. M.A. thesis. University of Exeter.

Based on archaeological finds in Denmark and Sweden, presents research into small Viking-period furnaces used to produce glass beads.

**Callmer, Johan and Julian Henderson**

1991 Glassworking at Åhus, S. Sweden (Eighth Century AD). *Laborativ arkeologi* 5:143-154. Examines the beadmaking technology and chemical composition of the recovered glass beads.

**Carroll, B. Harvey, Jr. with Jamey D. Allen**

2004 Bead Making at Murano and Venice. *Beads: Journal of the Society of Bead Researchers* 16:17-37.

This article reproduces a rare eyewitness account of beadmaking at Murano/Venice, Italy, towards the end of the First World War and documents the technology of the time as well as what impact the war had on the industry. Carroll's report takes us through the various steps in the production of drawn or tube beads and also provides a historical perspective of the industry. Although the report presents much useful information, we now know much more about most aspects of glass beadmaking and endnotes provide much additional information and clarification.

**Eluyemi, Omotoso**

1986 Technology of Ife Glass Beads: Excavations at Igbo-Olokun, Ile-Ife, Nigeria. In *The Social and Economic Contexts of Technological Change: The World Archaeological Congress, September 1-7, 1986*. Allen and Unwin, London.

1987 The Technology of the Ife Glass Beads: Evidence from the Igbo-Olokun. *Odu* 32:200-216. Provides a partial inventory of the Olokun beads and discusses their composition and dating. The contemporary fabrication of drawn and rolled beads in Ile-Ife, Nigeria, which uses crushed glass, is also discussed.

**Francis, Peter, Jr.**

1993 West African Powder Glass Beads. *Ornament* 16(4):96-97, 100-101.

Illustrated account of the manufacture and history of various kinds of beads made from pulverized glass.

**Gam Aschenbrenner, Tine**

1990 Perlmager af fag. *Skalk Aarhus* 34:12-15.

Experiments in glass beadmaking at Ribe, Denmark, during the 8th century.

1990 Prehistoric Glass Technology – Experiments and Analyses. *Journal of Danish History* 9:103-213. This valuable article reconstructs the methods for making various kinds of beads: reticella, millefiori, eye beads, etc.

1991 Glasperlefremstilling i yngre romersk jernalder og vikingetid. In *Ekspérimentel arkæologi. Studier i teknologi og kultur* 1, edited by B. Madsen, pp. 153-176. Historical-Archaeological Experimental Center, Lejre.

On glass bead manufacture in the Late Roman Iron Age and Viking period.

1993 Experiments in Glass – Present and Future. In *Annales du 12<sup>e</sup> Congrès de l'Association Internationale pour l'Histoire du Verre, Vienne 26-31 août 1991*, pp. 261-270. Amsterdam.

On the author's archaeo-experiments in glass beadmaking.

1995 Should We Believe in Experiments? In *Glass Beads: Cultural History, Technology, Experiment and Analogy*, edited by M. Rasmussen, U.L. Hansen, and U. Näsman, pp. 123-128. Historical-Archaeological Experimental Center, Studies in Technology and Culture 2.

1997 Glasperlenherstellung – Wie könnte sie vor sich gegangen sein? In *Perlen: Archäologie, Techniken, Analysen*, edited by Uta von Freeden and Alfred Wieczorek, pp. 315-320. Kolloquien zur Vor- und Frühgeschichte 1.

Experimentation has shown how wound beads from an 8th-century workshop at Ribe, Denmark, could have been made, though the furnace construction is still debatable.

1999 Shards or Beads? *Journal of Danish Archaeology* 13:121-132 (1996-1997).

2010 Glasperlenherstellung in Südsandinavien... oder: Notruf aus der Feuerstelle.... *Experimentelle Archäologie in Europa, Bilanz 2010*, Heft 9:163-172. Europäische Vereinigung zur Förderung der Experimentellen Archäologie, Oldenburg.

Experimental archaeology: glass bead manufacture in southern Scandinavia.

#### **Gott, Suzanne**

2014 Ghana's Glass Beadmaking Arts in Transcultural Dialogues. *African Arts* 47(1):10-29.

Discusses the various beadmaking traditions in modern Ghana.

#### **Government of India, Geographical Indications Registry**

2014 Varanasi Glass Beads - G.I. Application No 177. *Government of India, Geographical Indications Journal* 61:7-13; [www.ipindia.nic.in/writereaddata/Portal/IPOJournal/1\\_67\\_1/gi-journal-61.pdf](http://www.ipindia.nic.in/writereaddata/Portal/IPOJournal/1_67_1/gi-journal-61.pdf)

This Application for the Registration of a Geographical Indication contains information regarding the modern-day glass-bead industry in Varanasi, Uttar Pradesh, northern India, and the materials and techniques utilized.

#### **Greiff, S. and E. Nallbani**

2008 When Metal Meets Beads. Technological Study of Early Medieval Metal Foil Beads from Albania. *Mélanges de l'Ecole française de Rome, Moyen Âge* 120(2):355-375.

An in-depth examination of foil beads from the Bukël site in Albania using chemical analysis and optical microscopy. The beads date to the 7th-9th centuries.

#### **Grimbe, Jannika**

2010 Making Glass Beads from the Past. *euroREA: Journal for (Re)construction and Experiment in Archaeology* 7:19-22.

Reports on experiments to replicate the technology used to produce glass beads during the Scandinavian Iron Age.

### **Henderson, Julian**

1995 A Response to R. Lierke's Paper. In *Glass Beads: Cultural History, Technology, Experiment and Analogy*, edited by M. Rasmussen, U.L. Hansen, and U. Näsman, pp. 121-123. Historical-Archaeological Experimental Center, Studies in Technology and Culture 2.

Response to Lierke et al. (1995).

1996 Note on the Technology of the Glass Beads. In *Guernsey, an Island Community of the Atlantic Iron Age*, by B. Burns, B. Cunliffe, and H. Sebire, pp 113-114. Oxford University Committee on Archaeology Monograph 43, Guernsey Museum Monograph 6.

United Kingdom.

### **Hird, F.**

1998-1999 Venetian Beads. *Beads: Journal of the Society of Bead Researchers* 10-11:57-62.

An account, originally published in *The Girl's Own Paper* in 1896, of the techniques and conditions under which glass beads were made in Venice, Italy, during the latter part of the 19th century.

### **Hložeka, M. and T. Trojek**

2015 Millefiori Glasswork Technique in the Migration Period: Investigation of Beads with the Use of Nondestructive X-Ray Fluorescence Micro-Analysis. *Radiation Physics and Chemistry* 116:332-334, DOI:10.1016/j.radphyschem.2015.01.020.

Analysis centered on determining the composition and the production technology of a unique millefiori bead that was found in a burial ground in Kyjov (Hodonin district, Czech Republic) dating back to the Migration Period.

### **Holland, S. and T. Holland**

2006 Folded Glass Beads: An Islamic Innovation. *Ornament* 29(4):34-37.

Replicates the production of folded beads which appear at the end of the Roman period in the eastern Mediterranean. A few previous articles had tried to describe how they were made but some basic steps were lacking.

### **Höpken, Constanze**

2001 Melon Bead Production in the Naval Base of Cologne. *Instrumentum* 13:42ff.

Quartz-ceramic beads, Germany.

2003 Herstellung quarzkeramischer Melonenperlen im römischen Flottenlager Köln Alteburg: Terminologie – Technologie – Befund. *Xantener Berichte* 13:353-363.

Similar content to Höpken (2001).

### **Kanungo, Alok Kumar**

2001 Glass Beads in India: Lamp Winding and Moulding Techniques. *Man and Environment* 26(2):99-108.

2004 Glass Beads in Ancient India and Furnace-Wound Beads at Purdalpur: An Ethnoarchaeological Approach. *Asian Perspectives* 43(1):123-150.

Glass beads are presently a major product of India in at least three different locations, using altogether different techniques. Each production process leaves behind debitage unique to its individual

manufacturing process. Archaeologically, it is imperative to identify and record the production techniques of glass bead manufacture and to identify the various specific waste products rather than merely speaking of beads and production centers on the basis of statistics.

### **Karklins, Karlis**

1982 Guide to the Description and Classification of Glass Beads. In *Glass Beads*, Parks Canada, *History and Archaeology* 59:83-117.

Provides concise descriptions of the manufacture of drawn, wound, blown, mold-pressed, wound-on-drawn, and Prosser-molded beads. An updated and expanded version appears in Karklins (2012).

1993 The *A Speo* Method of Heat Rounding Drawn Glass Beads and its Archaeological Manifestations. *Beads: Journal of the Society of Bead Researchers* 5:27-36.

Describes the method generally used for rounding large glass beads in European glasshouses from the early 17th century to the latter part of the 18th century.

2005 Die "a speo"-Methode zur Rundung gezogener Glasperlen durch Erhitzen und ihre archäologische Erscheinungsformen. *Der Primitivgeldsammler* 26(1):3-8.

German translation of Karklins (1993) with different (and color) images.

2012 Guide to the Description and Classification of Glass Beads found in the Americas. *Beads: Journal of the Society of Bead Researchers* 24:62-90.

Provides concise descriptions of the manufacture of drawn, wound, blown, mold-pressed, wound-on-drawn, and Prosser-molded beads.

### **Karklins, Karlis with Carol F. Adams**

1990 Dominique Bussolin on the Glass-Bead Industry of Murano and Venice (1847). *Beads: Journal of the Society of Bead Researchers* 2:69-84.

Translation from a French book of 1847 by the noted glassmaker Dominique (Domenico) Bussolin on Venetian bead manufacture and trade. Italy.

### **Karklins, Karlis and Derek Jordan**

2009 An Early 19th-Century Account of Beadmaking in Murano and Venice. *Beads: Journal of the Society of Bead Researchers* 21:73-74. Reprinted from *The Bead Forum* 17:5-8 (1990).

In 1816, two German botanists recorded one of the first accounts of drawn beadmaking in Venice, Italy. This version corrects several errors that appear in an earlier translation.

### **Kock, Jan and Torben Sode**

1995 *Glass, Glass Beads and Glassmakers in Northern India*. THOT, Vanlose, Denmark.

Copiously illustrated study, covering traditional beadmaking in Firozabad, Jalesar, and Purdalpur, all near Agra, India. Tools and furnaces used in making raw glass, beads, and bangles are covered.

### **Krzyżanowska, Marta and Mateusz Frankiewicz**

2015 An Archaeological Experiment with Early Medieval Glass Bead Production in an Open Hearth – The Results. *Slavia Antiqua* LVI:109-127.

The aim of this research was to verify the hypothesis of glass bead production in an open hearth, based on archeological evidence from Viking Age Ribe, Denmark, where the remains of “glass” hearths were discovered.

**Küçükerman, Önder**

1987 *Glass Beads: Anatolian Glass Bead Making: The Final Traces of Three Millennia of Glass Making in the Mediterranean Region*. Turkish Touring and Automobile Association, Istanbul.  
Furnace-wound beadmaking in western Turkey.

**Lierke, Rosemarie, F. Birkhill, and P. Molnar**

1995 Experimental Reproduction of Spiral Beads. In *Glass Beads: Cultural History, Technology, Experiment and Analogy*, edited by M. Rasmussen, U.L. Hansen, and U. Näsman, pp. 117-121. Historical-Archaeological Experimental Center, Studies in Technology and Culture 2.  
See Henderson (1995) for a response.

**Liu, Robert K.**

1989 Mosaic Face Beads. *Ornament* 12(3):22-23.  
On Roman, Venetian, and modern Indian methods of manufacture.

**Matthes, C., M. Heck, C. Theune, P. Hoffmann, and J. Callmer**

2004 Produktionsmechanismen von frühmittelalterlichen Glasperlen. *Germania* 82(1):109-157.  
Discusses the production mechanisms of early medieval glass beads.

**Moretti, Cesare**

2001 Le materie prime dei vetrai veneziani rilevate nei ricettari dal XIV alla prima metà del XX secolo. II parte: elenco materie prime, materie sussidiarie e semilavorati. *Rivista della Stazione Sperimentale del Vetro* 31(3):17-32.  
Part II of Moretti and Moretti (1999). This part presents a full list of the primary and secondary raw materials and intermediate products, culled from recipe books of the 14th-20th centuries, found mainly in private collections. The nature, chemical formula, and function of the recipes are indicated with additional historical information and sources, where known.

**Moretti, C. and S. Moretti**

1999 Le materie prime dei vetrai veneziani. Natura, lessico e fonti di approvvigionamento rilevate dai ricettari dal XIV al XIX secolo. *Rivista della Stazione Sperimentale del Vetro* 29(1):31-42.  
Lists all the raw materials found in ca. 70 Venetian manuscripts of the 14th-19th centuries along with the name of the original manuscript and its date. Also provides chemical formulae and the source or origin of the materials when possible.

**Moretti, Cesare and Tullio Toninato**

2011 *Glass Recipes of the Renaissance*. Watts Publishing, London.  
Provides a transcription of an anonymous Venetian manuscript from the mid-16th century along with an English translation with notes by David C. Watts and Cesare Moretti. Many recipes are specifically for beads.

**Morris, Carole**

1994 Powder Glass Beads from Dunkwa, Gold Coast (Ghana). *Bead Society of Great Britain Newsletter* 25:9-10.

A complete “kit” for making powder glass beads collected in the 1930s is in the Beck Collection, Cambridge.

**Neri, Antonio**

2002-2007 *L'arte vetraria/The Art of Glass*. 3 vols. Translated and annotated by Paul Engle. Heiden and Engle, Hubbardston, MA.

Published in three instalments, this is a new translation of the original, which was first published in 1612, and is generally recognized as a seminal work. An inset facsimile page of the original in 17th-century Italian accompanies each page of the translation. At the end of each volume is a glossary, full notes, a select bibliography, and appendices.

**Neuwirth, Waltraud**

1993 *Farbenglas I/Color in Glass I*. Self published, Vienna, Austria.

While not dealing directly with beads, this well-illustrated English/German volume will be of interest to anyone concerned with color in glass. There are hundreds of 18th-20th-centuries formulae for the researcher or glass artist. The present volume covers white, black, yellow and green.

1994 *Perlen aus Gablonz: Historismus, Jugendstil/Beads from Gablonz: Historicism, Art Nouveau*. Self published, Vienna.

This major work presents a detailed and well illustrated account of the Bohemian beads industry including history, technology, and numerous color plates that illustrate the various products. Text is in German and English. Czech Republic.

1998 *Farbenglas II: Farbenpaletten blau, rot, Index/Color in Glass II: Color Pallets Blue, Red, Index*. Self published, Vienna, Austria.

Like Neuwirth (1993) but the colors covered are blue and red.

2011 *Beads from Gablonz. Beads: Journal of the Society of Bead Researchers* 23.

This volume reprints the revised English text of Dr. Neuwirth's (1994) treatise on the Bohemian bead industry complete with all 50 color plates. Czech Republic.

**Opper, Marie-José and Howard Opper**

1996-1997 *Imitation Pearls in France. Beads: Journal of the Society of Bead Researchers* 8-9:23-34.

Describes the different ways of making “false pearls” and illustrates some of the various styles, with a focus on the 20th century and Rousselet, a Parisian beadmaking firm.

**Peake, James R.N. and Ian C. Freestone**

2012 *Cross-Craft Interactions between Metal and Glass Working: Slag Additions to Early Anglo-Saxon Red Glass*. In *Integrated Approaches to the Study of Historical Glass – IAS12*, edited by Wendy Meulebroeck, Karin Nys, Dirk Vanclooster, and Hugo Thienpont, pp. 1-12. Proceedings of the International Society for Optical Engineering 8422.

SEM-EDS analysis of glass beads from the early Anglo-Saxon cemetery complex at Eriswell, southeast England, has provided insights into the production and technology of opaque red glass.



**Peterson, N., S. Backa, J. Ross, and R. Schweitzer**

2014 Glass on Fire: Temperatures in Reconstructed Viking Era Bead Furnaces. In *“Can These Bones Come to Life?”* Vol. 2, edited by Michael A. Cramer, pp. 27-44. Freelance Academy Press, Wheaton, IL.

On the glass-working temperatures achieved in different types of reconstructed furnaces.

***The Pottery Gazette***

2009 How Beads are Made – 1890. *Beads: Journal of the Society of Bead Researchers* 21:111-114. Reprinted from *The Bead Forum* 11:2-8 (1987).

This article on the production of drawn glass beads on the Island of Murano, Venice, Italy, is most notable for the drawings of the various steps in the production process. A discussion of the manufacture of false pearls is also presented.

**Purowski, Tomasz**

2007 Evidence of Winding Technique on Glass Beads Discovered at the Lusatian Culture Stronghold in Wicina, Site 1. *Archaeologia Polona* 45:27-34.

Dated to late Hallstatt C and Hallstatt D, ca. 850 glass beads from Wicina 1 site in Poland were examined and 22% were found to be made by the winding technique.

2008 Badania techniki wyrobu paciorków szklanych okresu halsztackiego metodami petrograficznymi (Petrographic Methods in the Study of Hallstatt Glass Bead Manufacturing Techniques). *Archeologia Polski* LIII(1):7-24.

The examination of petrographic thin sections of five glass beads from the Wicina stronghold have demonstrated beyond doubt the usefulness of the method in determining beadmaking techniques attributed to the Halstatt period. English summary.

**Råhlander, Moa**

2017 *How Beads Come Together: Late Iron Age Glass Beads as Past Possessions and Present Sources*. Masteruppsats i Arkeologi, Stockholms Universitet.

Investigates processes of glass bead production in Scandinavia and Anglo-Saxon England during the 6th-9th centuries.

**Rolland, Joëlle**

2017 L'artisanat du verre dans le monde celtique au second âge du Fer : approches archéométriques, technologiques et sociales / Glass Craftsmanship in the Celtic World during the Second Iron Age: Archeometric, Technological and Social Approaches. Ph.D. dissertation. Université Paris 1 - Panthéon-Sorbonne, Paris.

Approaches La Tène glassmaking through a socio-economic perspective. Includes the chaîne opératoire for glass beads.

**Ross, Lester A.**

2005 Late 19th- and Early 20th-Century Manufacture of Drawn Glass Tubing for Glass Beads. *Beads: Journal of the Society of Bead Researchers* 17:35-51.

An examination of hundreds of U.S. patents reveals that the mechanized production of drawn beads could have occurred as early as the late 19th century, but more likely, they were not mass produced until the end

of World War I, after the invention of the Danner process for mechanically drawing glass tubing. These beads sometimes have multiple sides and/or distinctive polyhedral perforations.

**Ross, Lester A. with Barbara Pflanz**

1989 Bohemian Glass Beadmaking: Translation and Discussion of a 1913 German Technical Article. *Beads: Journal of the Society of Bead Researchers* 1:81-94.

Provides technical information on Bohemian glass beadmaking during the late 19th and early 20th centuries. The article concentrates on the manufacture of mold-pressed beads, secondarily describing methods for producing wound, blown, and drawn beads.

**Sablerolles, Yvette, J. Henderson, and W. Dijkstra**

1997 Early Medieval Glass Bead Making in Maastricht (Jodenstraat 30), The Netherlands. An Archaeological and Scientific Investigation. In *Perlen: Archäologie, Techniken, Analysen*, edited by Uta von Freeden and Alfred Wieczorek, pp. 291-213. Kolloquien zur Vor- und Frühgeschichte 1. Glassworking, together with other high-temperature industries, was practiced in Merovingian Maastricht. A pit of the late 6th to early 7th centuries in the Jodenstraat yielded comprehensive evidence for glass beadmaking and some interesting technological information.

**Schultz, Sarah and Heather Walder**

2016 Technologies of Refired Glass Pendant Production: Experimental Replication Results. *The Wisconsin Archeologist* 97(2):29-48.

Drawing on ethnohistoric sources and the material properties of refired glass pendants recovered from 17th-18th-century sites across the Plains and Midwest regions of North America, investigates the production process.

**Sode, Torben**

1997 Contemporary Anatolian Glass Beads. An Experimental Study. In *Perlen: Archäologie, Techniken, Analysen*, edited by Uta von Freeden and Alfred Wieczorek, pp. 321- 324. Kolloquien zur Vor- und Frühgeschichte 1.

Photographs and sketches show how contemporary Anatolian glass beadmakers get their effects with the simplest technology. This has relevance for archaeological bead studies. Turkey.

2004 Glass Bead Making Technology. In *Ribe Excavations 1970-76*, Vol. 5, edited by Mogens Bencard and Helge Brinch Madsen, pp. 83-102. Jutland Archaeological Society Publications 46. The important 8th-century trading center of Ribe, Denmark, has produced many bead finds and much evidence regarding local beadmaking.

**Sode, Torben, Claus Feveile, and Ulrich Schnell**

2010 An Investigation on Segmented, Metal-Foiled Glass Beads and Blown, Mirrored Glass Beads from Ribe, Denmark. In *Zwischen Fjorden und Steppe: Festschrift für Johan Callmer zum 65. Geburtstag*, edited by Claudia Theune, Felix Biermann, Ruth Struwe, and Gerson H. Jeute, pp. 319-328. Internationale Archäologie, Studia Honoraria 31.

A substantial number of the glass beads excavated at Ribe are imported beads, especially prevalent in the late 8th and beginning of the 9th century. Manufacturing techniques are discussed.

**Spaer, Maud**

1993 Gold-Glass Beads: A Review of the Evidence. *Beads: Journal of the Society of Bead Researchers* 5:9-25.

Describes the types and methods of manufacture of these beads from the 3rd century BC using gold foil. Rhodes is at present the sole known production site. In parts of eastern Europe, these beads lasted into the early 13th century AD.

**Sprague, Roderick and An Jiayao**

1990 Observations and Problems in Researching the Contemporary Glass-Bead Industry of Northern China. *Beads: Journal of the Society of Bead Researchers* 2:5-13.

The authors visited several factories and describe the manufacture of various bead types in an industry now changing under pressure from the plastic bead industry.

**Staššiková-Štukovská, Danica and Alfonz Plško**

2015 Unusual Early Medieval Glass Technologies and their Origin. In *Стекло Восточной Европы с древности до начала XX века* (East European Glass from Antiquity to the Beginning of 20th Century, edited by P.G. Gaidukov, pp. 279-285. Nestor-History, St. Petersburg.

Three unusual beadmaking technologies employed in the region of Slovakia during the 7th-10th centuries are discussed: 1) utilizing glass impurities for ornamentation, 2) decorating with minute balls using binder, and 3) the use of “glass-crystalline” or “glass-quartz” techniques.

**Stern, E. Marianne and Birgit Schlick-Nolte**

1994 *Early Glass of the Ancient World 1600 BC - AD 50: Ernesto Wolf Collection*. Hatje, Ostfildern. Contains a long section on glass and faience manufacture (pp. 19-94) with superb color photos. Many provenances are given as “Art market, Zurich.”

**Teruzzi, Giorgio and Anna Alessandrello (eds.)**

2007 *Trade Beads: From Venice to the Gold Coast*. Centro Studi Archeologia Africana, Milano.

This exhibition catalog provides a brief overview of the Venetian bead industry including well-illustrated descriptions of the two major glass beadmaking processes (drawn and wound) and the various styles/types of beads (some on sample cards) that were produced for trade in Africa as well as elsewhere.

**Theune, C., J. Callmer, M. Heck, and P. Hoffmann**

1997 Glasperlenproduktion im Frühmittelalter. *Ethnographisch-Archäologische Zeitschrift* 38:225-234. On glass bead production in the early Middle Ages.

**Wiesenberg, Frank**

2016 Prinzipstudie Perlenofen: Glasperlen und Fläschchen. In *Experimentelle Archäologie: Studien zur römischen Glastechnik*, Band 1, edited by Bettina Birkenhagen and Frank Wiesenberg, pp. 110-126. Schriften des Archäologieparks Römische Villa Borg 7.

Experimenting with a bead furnace to replicate Roman-period beads and vials. In German and English.

**Willoughby, J.**

2005 *Glass Bead Making in Turkey and Ghana*. Ends of the Earth, Hampton.

This DVD shows detailed stages in making fused and powder-glass beads at Krobo and Asiofia, Ghana, and furnace-worked beads at Kurudere, Turkey.

## FAIENCE

### **Bellintani, Paolo, Mauro Cesaretto, and Giovanna Residori**

2003 Progetto "I materiali vetrosi nella protostoria dell'Italia del Nord". Archeologia, archeometria, etnoarcheologia e approccio sperimentale. In *Archeologie sperimentali. Metodologie ed esperienze fra verifica, riproduzione, comunicazione e simulazione, Atti del convegno: Comano Terme-Fiavè (Trento, Italy) 13-15 settembre 2001*, edited by P. Bellintani and L. Moser, pp. 311-335. Provincia autonoma di Trento.

Reports on experimental production replication of Bronze Age glass and faience beads found in northern Italy.

### **Hatton, G.D., A.J. Shortland, and M.S. Tite**

2008 The Production Technology of Egyptian Blue and Green Frits from Second Millennium BC Egypt and Mesopotamia. *Journal of Archaeological Science* 35(6):1591-1604.

Reports on the microstructure and chemical composition of some 55 Egyptian blue and green frit samples (including bead fragments) from New Kingdom Egypt and 15th-century BC Mesopotamia. The findings suggest that frit cakes were the primary product, and that these were ground to produce powder which was then molded to shape and refired to produce vessels and beads.

### **Kenoyer, J. Mark**

2005 Steatite and Faience Manufacturing at Harappa: New Evidence from Mound E Excavations 2000-2001. *Museum Journal* (National Museum of Pakistan) III-IV:43-56.

Discusses a workshop where various objects of steatite and faience were made, including beads. The findings suggest that the beads may have been quite important as symbols of value since they were being made in relatively controlled contexts.

### **Shortland, A.**

2003 Making a Talisman. *British Archaeology* (May):21.

Explains clearly how faience was made. Scottish and English prehistoric faience beads were made somewhat differently. In Scotland seaweed was used, and jabbing a sharp tool into the side of a paste cylinder formed segmented beads. In England, other kinds of plant ash were used and the beads were formed by rolling a cylinder against a shaper. Faience know-how was probably transmitted through the tin-trade connection.

### **Shortland, A.J., N. Shishlina, and A. Egorkov**

2007 Origins and Production of Faience Beads in the North Caucasus and the Northern Caspian Sea Region in the Bronze Age. In *Les cultures du Caucase: leur relations avec le Proche-Orient*, edited by B. Lyonnet, pp. 269-283. CNRS Editions, Paris.

### **Stocks, Denys A.**

1997 Derivation of Ancient Egyptian Faience, Core and Glaze Materials. *Antiquity* 71(271):179-182. An essential ingredient of the lovely blues in ancient Egyptian materials (faience, glazes, frits) is copper. How did the knowledge of that copper use arise? There is a telling congruence with Egyptian techniques in drilling stone artifacts, and the characteristics of the powder drilled out as waste.

**Tajeddin, Zahed**

2014 Egyptian Faience: Ancient Making Methods and Consideration of Technical Challenges in Sculptural Practice. PhD thesis. University of Westminster.

Discusses the structure and composition of Egyptian faience objects, and also provides a description of how faience beads and other objects are currently made in Qom, Iran.

**Tite, M.S. and M. Bimson**

1986 Faience: An Investigation of the Microstructures Associated with the Different Methods of Glazing. *Archaeometry* 28(1):69-78.

Towards discovering which of the three principal manufacturing methods (efflorescence, cementation, application) used in antiquity for glazing faience beads, etc., was used on a particular object.

**Tite, M.S., P. Manti, and A.J. Shortland**

2007 A Technological Study of Ancient Faience from Egypt. *Journal of Archaeological Science* 34(10):1568-1583.

The chemical composition and microstructure of 35 faience objects spanning the period from the Middle Kingdom through to the 22nd dynasty were determined using analytical scanning electron microscopy in order to determine with certainty whether ancient faience was glazed by efflorescence, cementation, or application.

**Zhang Zhiguo and Ma Qinglin**

2009 Faience Beads of the Western Zhou Dynasty Excavated in Gansu Province, China: A Technical Study. In *Ancient Glass Research Along the Silk Road*, edited by Gan Fuxi, Robert Brill, and Tian Shouyun, pp. 275-289. World Scientific Publishing, Singapore.

Discusses the chemical composition and manufacturing technology.

**Zhou Gu, Jian Zhu, Yaoting Xie, Tiqiao Xiao, Changsui Wang, and Yimin Yang**

2016 Production Technology of Faience Beads from Peng State Cemetery, Shanxi Province, China. In *Recent Advances in the Scientific Research on Ancient Glass and Glaze*, edited by Fuxi Gan, Qinghui Li, and Julian Henderson, pp. 553-532. World Century Publishing, Hackensack, NJ, and World Scientific Publishing, Singapore.

**METAL****Childs, S. Terry**

1994 Native Copper Technology and Society in Eastern North America. In *Archaeometry of Pre-Columbian Sites and Artifacts: Proceedings of a Symposium Organized by the UCLA Institute of Archaeology and the Getty Conservation Institute, Los Angeles, California, March 23-27, 1992*, edited by D.A. Scott and P. Meyers, pp. 229-253. The Getty Conservation Institute, Los Angeles. [http://www.getty.edu/conservation/publications\\_resources/pdf\\_publications/pdf/archaeometry.pdf](http://www.getty.edu/conservation/publications_resources/pdf_publications/pdf/archaeometry.pdf) accessed 31 December 2014.

Among other things, this article examines the cultural and non-cultural factors that influenced the effects of native copper production and use on different Native American societies over time. Beads are discussed.

**Francis, Peter, Jr.**

1992 West African Perspective: Lost-Wax Brass Casting. *Ornament* 15(4):98f.

An account of old methods still in use, with a photograph of an unusual, very large, intricate elbow bead of brass “netting.”

**Gates, Marie-Henriette**

1995 Archaeology in Turkey. *American Journal of Archaeology* 99:207-255.

Early Neolithic copper beads are found to have been heat-treated (p. 212).

**Hansen, Svend**

2016 Beads of Gold and Silver in the 4th and 3rd Millennium BC. In *From Bright Ores to Shiny Metals: Festschrift for Andreas Hauptmann on the Occasion of 40 Years Research in Archaeometallurgy and Archaeometry*, edited by Gabriele Körlin, Michael Prange, Thomas Stöllner, and Ünsal Yalçın, pp. 37-48. Veröffentlichungen aus dem Deutschen Bergbau-Museum Bochum 210.

Discusses metal beads in southern Europe with emphasis on narrow elongated specimens. Includes a section on beadmaking technology.

**Konstantinidi-Syvridi, Eleni, Nikolas Papadimitriou, Anna Philippa-Touchais, and Akis Goumas**

2014 Goldworking Techniques in Mycenaean Greece (17th /16th-12th century BC): Some New Observations. In *Metalle der Macht – Frühes Gold und Silber / Metals of Power – Early Gold and Silver*, edited by Harald Meller, Roberto Risch, and Ernst Pernicka, pp. 335-348. Tagungen des Landesmuseums für Vorgeschichte Halle 11(1).

The techniques discussed include granulation, the anticlastic technique, and “gold embroidery.” Beads are included in the discussion.

**Leusch, Verena, Ernst Pernicka, and Barbara Armbruster**

2014 Chalcolithic Gold from Varna – Provenance, Circulation, Processing, and Function. In *Metalle der Macht – Frühes Gold und Silber / Metals of Power – Early Gold and Silver*, edited by Harald Meller, Roberto Risch, and Ernst Pernicka, pp. 165-182. Tagungen des Landesmuseums für Vorgeschichte Halle 11(1).

Discusses some aspects of early goldworking and use on the basis of new analyses of gold objects (including beads) from the Late Chalcolithic cemetery, Varna I, in Bulgaria.

**McCoy, T.J.,A.E. Marquardt,John T. Wasson, Richard D. Ash, and Edward P. Vicenzi**

2017 The Anoka, Minnesota Iron Meteorite as Parent to Hopewell Meteoritic Metal Beads from Havana, Illinois. *Journal of Archaeological Science* 81:13-22.

Delves into the composition and manufacture of the beads, as well as the source of the material.

**Miller, Duncan E. and Nikolaas J. van der Merwe**

1994 Early Iron Age Metal Working at the Tsodilo Hills, Northwestern Botswana. *Journal of Archaeological Science* 21(1):101-115.

Describes Early Iron Age metal working at the sites of Divuyu and Nqoma including the fabrication of forged square wire and flat sheets of inhomogeneous iron and steel which were subsequently cut into strips for beads and other ornaments.

### **Prévalet, Romain**

2009 Preliminary Observation on Three Late Bronze Age Gold Items from Ras Shamra-Ugarit (Syria). *ArchéoSciences* 33:129-133.

Describes the technical characteristics of the filigree and granulation of two gold beads, as well as the joining processes that were employed by the craftsmen of a famous Levantine kingdom at the end of the 2nd millennium BC.

2013 La décoration des pièces d'orfèvrerie-bijouterie en Méditerranée orientale à l'âge du Bronze: techniques, productions, transmissions. Ph.D. dissertation. Université Paris 1 Panthéon-Sorbonne. A detailed study of the technology and production of gold ornaments, including beads and pendants, in the Eastern Mediterranean during the Bronze Age and the transmission of the techniques.

2014 Bronze Age Syrian Gold Jewellery – Technological Innovation. In *Metalle der Macht – Frühes Gold und Silber / Metals of Power – Early Gold and Silver*, edited by Harald Meller, Roberto Risch, and Ernst Pernicka, pp. 423-433. Tagungen des Landesmuseums für Vorgeschichte Halle 11(2).

Presents an overview of the manufacture of gold jewelry in Syria during the Bronze Age, beads included.

2014 Étude technique d'une perle en or de Tell Banat (Syrie) et réflexion sur la diffusion des savoirs au IIIe millénaire av. J.-C. *Syria* 91:247-260.

Reconstructs the technical processes employed in the 3rd millennium BC to produce a gold bead decorated with filigree and granulation at Tell Banat, Syria.

### **Schorsch, D.**

1995 The Gold and Silver Necklaces of Wah: A Technical Study of an Unusual Metallurgical Joining Method. In *Conservation in Ancient Egyptian Collections*, edited by C.E. Brown, F. Macalister, and M. Wright, pp. 127-135. Archetype Publications, London.

Ball beads of gold and of silver were investigated by X-ray, EDS/SEM, and other analytical methods, revealing how joins were made with the help of flanges. Ancient Egypt.

## **STONE**

### **Alarashi, Hala**

2014 La parure épipaléolithique et néolithique de la Syrie (12e au 7e millénaire avant J.-C.): Techniques et usages, échanges et identités. Ph.D. dissertation. Université Lumière-Lyon, Lyon. On the Epipalaeolithic and Neolithic personal adornments excavated at various sites in Syria (12th-7th millennia BC). Includes production technology, uses, and trade.

### **Altınbilek, Ç., G. Coşkunsu, Y. Dede, M.R.Iovino, C. Lemorini, and C. Özdoğan**

2001 Drills from Çayönü. A Combination of Ethnographic, Experimental and Use-Wear Analysis. In *Beyond Tools: Redefining the PPN Lithic Assemblages of the Levant*, edited by I. Caneva, C. Lemorini, D. Zampetti, and P. Biagi, pp. 137-144. Studies in Early Near Eastern Production, Subsistence, and Environment 9.

Delves into stone bead production technology at a site in southeastern Turkey.

**Amblard, Sylvie**

1984 *Tichit-Walata (R.I. Mauritanie): Civilisation et industrie lithique*. Éditions Recherche sur les civilisations, Paris.

Contains detailed remarks on beads from Mauritania, including stone-bead manufacturing techniques (pp. 191-200).

**Andrieu, Chloé, Edna Rodas, and Luis Luin**

2014 The Values of Classic Maya Jade: A Reanalysis of Cancuen's Jade Workshop. *Ancient Mesoamerica* 25:141-164.

Presents a technological reanalysis of material (beads included) recovered from a large jade preform production area in Guatemala and shows that the quality and color of the raw material corresponds to very different production processes, values, and distribution within the site.

**Auriscchio, C.**

1995 Analisi chimico-mineralogica di una perlina in "steatite" proveniente dal sito del Neolitico finale di Quadrato di Torre Spaccata (Roma). *Origini* 19:305-307.

SEM and electronic microsound analyses reveal the tools used for perforating and polishing a Late Neolithic steatite bead found in Rome, Italy. The stone probably came from some distance away: the Ligurian Alps or Tuscan-Emilian Appennines.

**Bains, Roseleen**

2012 The Social Significance of Stone Bead Technologies at Neolithic Çatalhöyük, Turkey. Ph.D. dissertation. University College London.

Examines technological practices and choices, reconstructs the manufacturing process, and analyzes production contexts in order to determine the organization of stone-bead production at a large Neolithic settlement.

**Bains, Roseleen, Milena Vasić, Daniella E. Bar-Yosef Mayer, Nerissa Russell, Katherine I. Wright, and Chris Doherty**

2013 A Technological Approach to the Study of Personal Ornamentation and Social Expression at Çatalhöyük. In *Humans and Landscapes of Çatalhöyük: Reports from the 2000-2008 Seasons*, edited by I. Hodder, pp. 331-364. Çatalhöyük Research Project 9. Cotsen Institute of Archaeology Press, Los Angeles.

Focuses on the technology and methods of manufacture of the recovered Neolithic beads, pendants, and preforms of stone, bone, shell, and clay. Turkey.

**Barthélemy de Saizieu, B., and M. Casanova**

1991 Semi-Precious Stones Working at Mundigak: Carnelian and Lapis Lazuli. *Proceedings of South Asian Archaeology* 11:17-30.

On the production of stone beads at a 5th-2nd-century site in Kandahar, Afghanistan.

**Baysal, Emma L.**

2014 Findings Relating to the Manufacture and Use of Stone Beads at Neolithic Boncuklu Höyük. *Colloquium Anatolicum* 13:57-79.

Discusses the production technology of the beads recovered from this site in Turkey.



**Belcher, Ellen H.**

2011 Halaf Bead, Pendant and Seal ‘Workshops’ at Domuztepe: Technological and Reductive Strategies. In *The State of the Stone Terminologies, Continuities and Contexts in Near Eastern Lithics*, edited by Elizabeth Healey, Stuart Campbell, and Osamu Maeda, pp. 135-143. *Studies in Early Near Eastern Production, Subsistence, and Environment* 13

Examines some of the technological aspects of stone beads, pendants, and seals from a large 6th-millennium BC site in southeast Turkey in terms of both the utilization of raw materials and the evidence for the methods of manufacture of final products.

**Bellintani, Paolo, Luciano Salzani, Gianni de Zuccato, Marilena Leis, Carmela Vaccaro, Ivana Angelini, Chiara Soffritti, Marco Bertolini, and Ursula Thun Hohenstein**

2015 L’ambra dell’insediamento della tarda Età del bronzo di Campestrin di Grignano Polesine (Rovigo). In *Preistoria e Protostoria del Veneto*, edited by Giovanni Leonardi and Vincenzo Tiné, pp. 419-426. *Studi di Preistoria e Protostoria* 2.

Discusses the late Bronze Age amber-working site of Campestrin di Grignano Polesine in northeastern Italy and provides a reconstruction of the *chaîne opératoire* of “Tiryns type” beads.

**Bernabò Brea, M., M. Miari, P. Bianchi, A. Ghiretti, R. Micheli, and J. Tirabassi**

2006 Manufatti litici d’adorno in Emilia tra neolitico ed età del Bronzo: tipologia, tecnologia, distribuzione. *Atti della XXXIX Riunione Scientifica*, Vol. II:697-712. Firenze.

Discusses the typology, technology, and distribution of stone ornaments (including beads and pendants) excavated in Emilia, northern Italy, made between the Neolithic and the Bronze Age.

**Bhan, Kuldeep K.**

2017 Stone Bead Production through the Ages in Gujarat. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 255-276. Indian Institute of Technology, Gandhinagar.

**Bhan, Kuldeep K., Jonathan Mark Kenoyer, and Massimo Vidale**

2017 Living Tradition: Stone Bead Production in Khambhat – An Ethnoarchaeological Approach. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 167-190. Indian Institute of Technology, Gandhinagar.

**Bril, Blandine, Valentine Roux, and Gilles Dietrich**

2000 Hâbiletés impliquées dans la taille des perles en calcédoine: caractéristiques motrices et cognitives d’une action située complexe. In *Cornaline de l’Inde: des pratiques techniques de Cambay aux techno-systèmes de l’Indus*, edited by V. Roux, pp. 211-329. Éditions de la Maison des sciences de l’homme, Paris.

Delves into the skills involved in knapping chalcedony beads at Cambay, India.

**Bruhns, Karen O.**

1987 Los talleres de cristal de roca en Pirincay, provincia del Azuay. *Miscelánea Antropológica Ecuatoriana* 7:91-100.

Discusses the production of beads from rock crystal at the Formative period site of Pirincay in the highlands of Ecuador.

### **Brunet, Olivier**

2009 Bronze and Iron Age Carnelian Bead Production in the UAE and Armenia: New Perspectives. *Proceedings of the Seminar for Arabian Studies* 39:57-68.

This technological study reveals the existence outside the Indus Valley of different productions and levels of technical skill. Included are discussions of heat treatment, knapping and finishing phases, and drilling.

2014 Les éléments de parure en pierre de la péninsule omanaise du 6e au 2e millénaire av. J.-C. : Production, circulation, valeurs. 3 vols. Ph.D. dissertation. Archéologie, Université Paris 1 Panthéon-Sorbonne.

Exhaustive study of the production, circulation, and value of stone beads and other ornaments from the Oman Peninsula during the 6th to 2nd millennium BC.

### **Calegari, Giulio**

1993 Le perle in «corniola» di Taouarde. L'arte e l'ambiente del Sahara preistorico: dati e interpretazioni. *Memorie della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano* 25(2):117-120.

Describes the shaping and perforation of prehistoric carnelian beads based on finds near Taouardei, Mali.

2003 Un petit atelier de perles en quartz de Taouardei. Préhistoire Art e Sociétés – Mélanges Jean Gausсен. *Bulletin de la Société Préhistorique Ariège-Pyrénées* LVIII:233-236.

Discusses a small workshop for making quartz beads at Taouardei, Mali.

### **Calley, Sylvie**

1989-1990 L'atelier de fabrication de perles de Kumartep: quelques observations technologiques. *Anatolica* 16:157-184.

Discusses a workshop in a Neolithic settlement in Turkey with debris and unfinished carnelian disc beads at various stages of manufacture. These illustrate the techniques of production.

### **Calley, Sylvie and Roger Grace**

1988 Technology and function of micro-borers from Kumartep (Turkey). In *Industries lithiques tracéologie et technologie*, edited by S. Beyries, pp. 69-81. BAR International Series 411.

Dated to the 6th millennium, a Neolithic bead workshop at Kumartep provides evidence for the production sequence of both flint micro-borers and carnelian beads.

### **Ciarlo, Nicolás C., Patricia Solá, and Cristina Bellelli**

2010 Caracterización de cuentas líticas provenientes del valle del Río Manso (Provincia de Río Negro). In *La arqueometría en Argentina y Latinoamérica*, edited by Silvana Bertolino Roxana Cattáneo Andrés D. Izeta, pp. 159-164. Facultad de Filosofía y Humanidades, Universidad Nacional de Córdoba, Córdoba.

Microscopic and analytical examination reveal that two stone beads found in central Argentina are made of a fine-grained metamorphic rock, possibly phyllite or slate. Comments regarding production techniques are provided.

### **Clark, J.D.**

1990 Why Change? An Example of the Technology from India's Enduring Past. *Bulletin of Deccan College* 49:83-98.

Proposes links between micro-blade and beadmaking techniques.

**Coşkunsu, Güner**

2008 Hole-Making Tools of Mezraa Teleilat with Special Attention to Micro-Borers and Cylindrical Polished Drills and Bead Production. *Neo-Lithics, The Newsletter of Southwest Asian Neolithic Research* 8(1):25-36.

Typo-technological analysis, use-wear analysis, and experimentation are used to illustrate two major technological and cultural shifts at Mezraa Teleilat, Turkey, towards the end of the Pre-Pottery Neolithic B (PPNB) and the beginning of the Pottery Neolithic (PN): 1) the use of micro-borers and cylindrical polished drills, which are the two most distinctive hole-making tools among the site's flint assemblage, and 2) bead manufacturing.

**Critchley, P.**

2000 Stone Bead Production at Wadi Jilat 25, a Neolithic site in Eastern Jordan: Technical, Economic, Social and Symbolic Aspects. M.A. thesis. Institute of Archaeology, University College London. Archaeological, ethnographic, and experimental evidence is used to investigate the technology of stone bead production at the site. The approach used is the *chaine operatoire* – how the production process is embedded in socio-economic and socio-cultural organization. Exchange networks, aspects of economic and craft specialization, and symbolic and aesthetic aspects of bead production are briefly described.

**Curcija, Zachary S.**

2016 An Evaluation of Prehistoric Southwestern Disc Bead Manufacturing. M.A. thesis. Department of Anthropology, Northern Arizona University, Flagstaff.

**Curcija, Z. and D. Wescott**

2014 Manufacturing Stone Disc Beads in the Tradition of the Prehistoric Southwest. *Bulletin of Primitive Technology* 47:38-42.

**de Mille, C.N. and T.L. Varney**

2003 A Preliminary Investigation of Saladoid Stone Bead Manufacturing. In *Proceedings of the XIX International Congress for Caribbean Archaeology, Aruba, 2001* II:43-53.

Antigua.

**de Mille, C.N., T.L. Varney, and M. Turney**

2008 Saladoid Lapidary Technology: New Methods for Investigating Stone Bead Drilling Techniques. In *Crossing the Borders: New Methods and Techniques in the Study of Material Culture in the Caribbean*, edited by C.L. Hofman, M.L.P. Hoogland, and A. Gijn, pp. 78-89. University of Alabama Press, Tuscaloosa.

The investigation focuses on the examination of manufacturing traces on the bore walls of stone beads from Antigua in addition to other attributes such as bore hole shape and size.

**d'Errico, F., V. Roux, and Y. Dumond**

2000 Identification des techniques de finition des perles en calcédoine par l'analyse microscopique et rugosimétrique. In *Cornaline de l'Inde: des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by V. Roux, pp. 95-113. Éditions de la Maison des sciences de l'homme, Paris.

Uses microscopic analysis and measurements of roughness to identify the techniques used to polish chalcedony beads at Cambay, India.

**Dimopoulou, N.**

1997 Workshops and Craftsmen in the Harbour-Town at Poros-Katsambas. In *TEXNH: Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age. Proceedings of the 6th International Aegean Conference, Philadelphia, 1996*, edited by R. Laffineur and P.P. Betancourt, pp. 433-438. Aegaeum 16.

Preliminary account of an important excavation of workshops at the harbor linked with the Minoan palace at Knossos, Crete. Finds include raw materials and finished beads, tools, and items such as abrasives and molds.

**Domanski, Marian and John Webb**

2007 A Review of Heat Treatment Research. *Lithic Technology* 32(2):153-194.

Discusses the heat treatment of stone beads to alter their color, appearance, and hardness.

**Du Gardin, Colette**

2015 Du nodule à la parure: l'artisanat de l'ambre à l'âge du Bronze en Europe occidentale / From Raw Material to Ornament: Amber Working in Western Europe During the Bronze Age. In *Artisanats et productions à l'âge du bronze. Actes de la journée de la Société Préhistorique Française, Nantes, 8 Octobre 2011*, edited by Sylvie Boulud-Gazo and Théophile Nicolas, pp. 45-61. Séances de la Société Préhistorique Française 4.

A comparative observation of the beads produced by the most important Bronze Age cultural groups confirms the existence of workshops with different degrees of specialization which produced the beads from amber imported from Northern Europe.

**Duhard, J.-P.**

2002 Quelques aspects techniques dans la confection des "perles" néolithiques en pierre du Sahara. *Bulletin de la Société Préhistorique Française* 99(2):357-365.

Discusses various aspects of the shaping, drilling, and polishing of Neolithic stone beads based on specimens found in situ in Algeria, Mali, Nigeria, and Mauritania.

2003 Quelques "ateliers" de perles du Mali nord-oriental découverts avec Jean Gaussen. *Préhistoire Art et Sociétés – Mélanges Jean Gaussen. Bulletin de la Société Préhistorique Ariège – Pyrénées*. LVIII:219-231.

Examines several ancient stone-bead workshops discovered in northeastern Mali.

**Endo, Hitoshi, Izumi Takamiya, and Renée Friedman**

2009 Field Note 3 - Beads and Bead Making at Hierakonpolis. *Archaeology's Interactive Dig*. <http://interactive.archaeology.org/hierakonpolis/field09/3.html>, accessed 18 December 2016.

Stone beadmaking; Ancient Egypt.

**Fabiano, M., F. Berna, and E. Borzatti von Lowenstern**

2004 Pre-Pottery Neolithic Amazonite Bead Workshops in Southern Jordan. In *Acts of the XIVth World Congress of the Union of Prehistoric and Protohistoric Sciences (UISPP), Liege (Belgium), 2nd-*

8th September 2001, edited by the Secrétariat du Congrès, pp. 265-275. British Archaeological Reports, International Series 1303.

Thousands of borers and awls were found together with hundreds of worked and unworked amazonite fragments. A few finished beads of amazonite and sandstone were also found. Experiments demonstrate that the awls were mounted in drills and the majority of the borers were actually drill bits.

**Falci, Catarina Guzzo and Maria Jacqueline Rodet**

2016 Adornos corporais em Carajás: a produção de contas líticas em uma perspectiva regional / Body Ornaments from the Carajás Region: Stone Bead Production in a Regional Perspective. *Boletim do Museu Paraense Emílio Goeldi. Ciências Humanas* 11(2):481-503.

Site MMA-02, in the state of Pará, Brazil, and associated with the Amazonian variant of the Tupiguarani tradition, was a specialized place for the production of body adornments from stone known as silicified kaolinite.

**Fedorchenko, A. Ju.**

2015 Stone Ornaments of Cultural Layer VII, Ushki Sites (Central Kamchatka): Technological Analysis. *Bulletin of the Far East Branch of the Russian Academy of Sciences* 1:100-114.

Reports on the series of stone beads, pendants, and plaques recovered from the Ushki sites complex in Central Kamchatka, Russia, with emphasis on production technology. In Russian with short English summary.

**Francis, Peter, Jr.**

1988 Pecking and Beads. *Lapidary Journal* 42(5):57-62.

Pecking (spot percussion) for dimpling, perforating, and shaping beads.

**Frazier, S., A. Frazier, and G. Lehrer**

1998-1999 A History of Gem Beadmaking in Idar-Oberstein. *Beads: Journal of the Society of Bead Researchers* 10-11:35-47.

Discusses the famous stone beadmaking emporium of Idar-Oberstein in west-central Germany. It describes the water-driven cutting mills, the technology, the sources of agate and other gemstone materials, and the harsh working conditions of former times.

**Gallaga Murrieta, Emiliano and Emiliano Melgar Tizoc**

2016 Las turquesas del Valle de Onavas: Análisis y resultados. In *Sociedades Mineras en América Latina* 1, edited by Abel Rodríguez López, pp. 110-127. Escuela de Antropología e Historia del Norte de México, Chihuahua.

Discusses the production techniques used to shape and perforate turquoise beads and pendants in the Onavas Valley of Senora, Mexico.

**Garrido Escobar, Francisco Javier**

2015 Mining and the Inca Road in the Prehistoric Atacama Desert, Chile. Ph.D. dissertation. Dietrich School of Arts and Sciences, University of Pittsburgh.

Investigates the social organization and *chaîne opératoire* of turquoise and malachite beads production at camps on the Cachiuyuyo de Llampos Mountain and the nature of settlement and associated artifact assemblages along a nearby section of the Inca Road.

**Gausson, J.**

1993 Perles néolithiques du Tilemsi et du pays Ioullemedene (Ateliers et techniques). L'Arte e l'ambiente del Sahara preistorico: dati e interpretazioni. *Memorie della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano* XXVI(II):253-256.

Deals with Neolithic beadmaking techniques observed at workshops found at Tilemsi, Mali, and the Ioullemedene region.

**González-Urquijo, Jesús, Frederic Abbès, Hala Alarashi, Juan José Ibáñez, and Talía Lazuén**

2013 Microdrill Use at Khiamian Sites in Central and Northern Levant (Syria and Lebanon). In *Stone Tools in Transition: From Hunter-Gatherers to Farming Societies in the Near East*, edited by Ferran Borrell, Juan José Ibáñez, and Miquel Molist, pp. 177-189. Universitat Autònoma de Barcelona, Servei de Publicaci.

Drills found in the Khiamian levels at Tell Mureybet, Wadi Tumbaq 1, and Nachcharini were used mainly to perforate stone beads. This is evident from use-wear marks on the active areas and the residue preserved on them. All the evidence points to at least some of them being hafted.

**Gorelick, L. and A.J. Gwinnett**

1987 The Change from Stone Drills to Copper Drills in Mesopotamia: An Experimental Perspective. *Expedition* 29(3):15-24.

Modern experiments and the detailed study of drill holes place the change in the 3rd millennium BC.

1988 Diamonds from India to Rome and Beyond. *American Journal of Archaeology* 92(4):547-552. Suggests that the use of diamond drills traveled to the Mediterranean in Roman times from India.

1990 Innovative Lapidary Craft Technique in Neolithic Jarmo. *Archaeomaterials* 4:25-32.

Hard stone beads found in northern Iraq were probably worked with a bow drill and loose abrasive.

1994 Beads from Sipan: A Functional Analysis. In *Archaeometry of Pre-Columbian Sites and Artifacts: Proceedings of a Symposium Organized by the UCLA Institute of Archaeology and the Getty Conservation Institute, Los Angeles, California, March 23-27, 1992*, edited by David A. Scott and Pieter Meyers, pp. 175-180. Getty Conservation Institute, Marina del Rey.

A total of 14 mostly tiny turquoise beads excavated from the royal tomb at Sipan, Peru, were studied to determine the method of manufacture using functional analysis and scanning electron microscopy. Two manufacturing hypotheses and experimental duplication are discussed.

1996 Innovative Methods in the Manufacture of Sasanian Seals. *Iran* 34:79-84.

Further study of ancient drilling techniques based on 124 Sasanian seals in the Metropolitan Museum of Art. Most were perforated using iron drills but the remainder seem to have been drilled using twin diamond-tipped iron drills. Also discusses the technical problems of faceting and speculates on the import of garnet bead blanks drilled at workshops within the Sasanian Empire.

**Groman-Yaroslavski, Iris and Daniella E. Bar-Yosef Mayer**

2015 Lapidary Technology Revealed by Functional Analysis of Carnelian Beads from the Early Neolithic Site of Nahal Hemar Cave, Southern Levant. *Journal of Archaeological Science* 58:77-88.

Use-wear analysis applied to two carnelian beads from the Middle Pre-Pottery Neolithic B period in southern Israel revealed a manufacturing procedure that corresponds to genuine lapidary technologies of contemporary traditional societies.

**Gurova, Maria, Clive Bonsall, Bruce Bradley, and Elka Anastassova**

2013 Approaching Prehistoric Skills: Experimental Drilling in the Context of Bead Manufacturing. *Bulgarian e-Journal of Archaeology* 3(2):201-221.

Experimentation on drilling stone of various hardness, as well as shell and bone, using replicated micro-borers and employing manual and mechanical drilling (with a pump drill).

**Gurova, Maria, Clive Bonsall, Bruce Bradley, Elka Anastassova, and Pedro Cura**

2014 Experimental Approach to Prehistoric Drilling and Bead Manufacturing. In *Technology and Experimentation in Archaeology*, edited by Sara Cura, Jedson Cerezer, Maria Gurova, Boris Santander, Luiz Oosterbeek, and Jorge Cristóvão, pp. 47-55. BAR International Series 2657.

Presents experiments in drilling different materials including minerals and rocks, as well as shell and bone, to help understand bead production during the Early Neolithic in the Balkans.

**Guzzo Falci, Catarina and Maria Jacqueline Rodet**

2016 Adornos corporais em Carajás: a produção de contas líticas em uma perspectiva regional / Body Ornaments from the Carajás Region: Stone Bead Production in a Regional Perspective. *Boletim do Museu Paraense Emílio Goeldi. Ciências Humanas* 11(2):481-503.

Site MMA-02 in the Serra dos Carajás region of Brazil, associated with the Amazonian variant of the Tupiguarani tradition, was a specialized place for the production of body adornments from a raw stone material known as silicified kaolinite. Disc beads were the main product.

**Gwinnett, A.J. and L. Gorelick**

1986 Evidence for the Use of a Diamond Drill for Bead Making in Sri Lanka, c. 700-1000 A.D. *Scanning Electron Microscopy* 11:473-477.

The highly-magnified comparison of quartz beads made using a diamond splinter turned by a bow drill in present-day Cambay, India, to those from archaeological contexts in Sri-Lanka suggests that the latter were similarly manufactured.

1988 A Possible Lapidary Training Piece from Arikamedu, India. *Archeomaterials* 2(2):187-193.

A worked rock crystal, not dating after AD 300, may be the earliest evidence of diamond drilling technology.

1989 Evidence for Mass Production Polishing in Ancient Bead Manufacture. *Archeomaterials* 3(2):163-168.

Experiments reveal that tumbling was practiced at the important beadmaking center at Mantai in Ceylon, ca. AD 700-1000.

1991 Bead Manufacture at Hajar ar-Rayhani, Yemen. *Biblical Archaeologist* 54(4):186-196.

Investigation of 64 stone beads (12th century BC to 1st century AD) reveals drilling techniques (Indian connections?) and the earliest evidence for polishing by tumbling (9th-8th centuries BC).

1993 Beads, Scarabs, and Amulets: Methods of Manufacture in Ancient Egypt. *Journal of the American Research Center in Egypt* 30:125-132.

Illustrates the development of drill technology from predynastic times to late antiquity.

1998-1999 A Brief History of Drills and Drilling. *Beads: Journal of the Society of Bead Researchers* 10-11:49-56.

Silicone impressions of the perforations of beads, amulets, and seals are interpreted to define the types of drill used; scanning electron micrographs can identify drill holes from the Paleolithic to the present day, and the drills used.

#### **Healey, Elizabeth and Stuart Campbell**

2014 Producing Adornment: Evidence of Different Levels of Expertise in the Production of Obsidian Items of Adornment at Two Late Neolithic Communities in Northern Mesopotamia. *Journal of Lithic Studies* 1(2):79-99.

Attempts to determine whether beads and other obsidian ornaments were produced at two sites (Domuztepe and Tell Arpachiyah) in Turkey and Iraq, or were acquired as finished objects (or both).

#### **Heimpel, W., L. Gorelick, and A. Gwinnett**

1988 Philological and Archaeological Evidence for the Use of Emery in the Bronze Age Near East. *Journal of Cuneiform Studies* 40(2):195-210.

On the prized abrasive from Egypt, India, and the Greek island of Naxos used from ca. 2000 BC for, inter alia, the manufacture of stone beads.

#### **Horn, M.**

2015 Preliminary Investigations Into the Production of Glazed Steatite Beads: Discussing the Use of Turquoise During the Badarian Period in Egypt. *Archéo-Nil* 25:91-121.

Several beads and pendants found in Badarian graves in the Qau-Matmar region of Middle Egypt formerly identified as turquoise are actually glazed steatite.

#### **Inizan, Marie-Louise**

2000 Importation de cornalines et agates de l'Indus en Mésopotamie: Le cas de Suse et Tello. In *Cornaline de l'Inde: Des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by Valentine Roux, pp. 475-501. Éditions de la Maison des sciences de l'homme, Paris.

<http://books.openedition.org/editionsmsmh/8738>

Discusses the importation of carnelian and agate bead from the Indus Valley to Mesopotamia based on material recovered from two sites in Iraq and Iran, with notes on manufacturing technology.

#### **Johnson, Jay K.**

2000 Beads, Microdrills, Bifaces, and Blades from Watson Brake. *Southeastern Archaeology* 19(2):95-104.

Description and discussion of the stone beads and the tools used in their manufacture at this Middle Archaic mound site in northern Louisiana.



**Kanungo, Alok Kumar**

2017 Transitions in the Stone Beadmaking at Khambhat: An Ethnohistorical Survey. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 191-222. Indian Institute of Technology, Gandhinagar.

**Karant, R.V.**

1988 Silica Bead Industry in Cambay, Gujarat State, India. *Journal of the Geological Society of India* 31:426-431.

1990 The Diamond Drill Used in the Cambay Bead Industry. *Journal of Gemmology* 22:91-96.  
Drilling stone beads at Khambhat, India.

1992 The Ancient Gem Industry in Cambay. *Man and Environment* 17(2):62-70.  
Discusses basic Cambay (India) beadmaking techniques with clear line drawings of the processes.

**Karklins, Karlis, Alicia Hawkins, Heather Walder, and Scott Fairgrieve**

2018 Florida Cut-Crystal Beads in Ontario. *Beads: Journal of the Society of Bead Researchers* 30:44-51.

Discusses three faceted rock-crystal beads generally termed Florida Cut-Crystal which were found in the legacy collections of two 17th-century Huron-Wendat sites in southern Ontario. Includes details about their manufacture and chemical composition.

**Kelly, Gwendolyn O.**

2013 Craft Specialization, Technology and Social Change: A Study of Material Culture in Iron Age and Early Historic South India (c. 1200 BCE - 400 CE). Ph.D. dissertation. University of Wisconsin, Madison.

An in-depth study of stone bead and ornament production and technology in South India.

2016 Heterodoxy, Orthodoxy and Communities of Practice: Stone Bead and Ornament Production in Early Historic South India (c. 400 BCE - 400 CE). *Archaeological Research in Asia* 6:30-50.  
Argues that the South Indian producers of stone beads and ornaments should be considered as a single community of practice, not as distinct ethnic groups, as suggested by some. Also deals with beadmaking techniques.

**Kenoyer, J. Mark**

1992 Lapis Lazuli: Beadmaking in Afghanistan and Pakistan. *Ornament* 15(3):70-73, 86f.  
Detailed account of the methods used, some of which may go back millennia.

2003 Stone Beads and Pendant Making Techniques. In *A Bead Timeline. Vol. 1: Prehistory to 1200 CE*, edited by James W. Lankton, pp. 14-19. The Bead Museum, Washington, D.C.

A general survey of stone beadmaking techniques.

2005 Bead Technologies at Harappa 3300-1900 BC: A Comparative Summary. In *South Asian Archaeology 2001*, edited by C. Jarrige and V. Lefèvre, pp. 157-170. Editions Recherche sur les Civilisations -- ADPF, Paris.

The analysis of beads from different periods and areas of Harappa, Pakistan, have made it possible to define specific trade networks and the organization of production as well as changing patterns of interaction over the history of the site.

2005 Steatite and Faience Manufacturing at Harappa: New Evidence from Mound E Excavations 2000-2001. *Museum Journal* (National Museum of Pakistan) III-IV:43-56.

Discusses a workshop where various objects of steatite and faience were made, including beads. The findings suggest that the beads may have been quite important as symbols of value since they were being made in relatively controlled contexts.

2011 Comments on the SEM Images of Silicon-Based Impressions of Beads Holes. In *Excavations of Farmana, District Rohtak, Haryana, India: 2006-2008*, edited by V. Shinde, T. Osada, and M. Kumar, pp. 469-470. Indus Project Research Institute for Humanity and Nature, Kyoto.

2017 Using SEM to Study Stone Bead Technology. In *History, Science & Technology of Stone Beads*, edited by Alok Kanungo, pp. 409-437. Gandhinagar & Aryan Press, Ahmedabad and Delhi. (In press)

Presents a detailed discussion of the use of scanning electron microscopy to garner details regarding bead production techniques and how to prepare specimens for study. Also provides an overview of the various recorded drilling techniques with SEM images of each.

2017 History of Stone Beads and Drilling: South Asia. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 127-150. Indian Institute of Technology, Gandhinagar.

#### **Kenoyer, J. Mark and Dennys Frenez**

2018 Stone Beads in Oman during the 3rd to 2nd Millennia BCE: New Approaches to the Study of Trade and Technology. *Beads: Journal of the Society of Bead Researchers* 30:63-76.

Archaeological collections in Oman were documented to determine the range of variation in the finished objects and if there is evidence for local production of carnelian and other hard-stone beads. Also provides a chronological discussion of the different techniques used to drill stone beads and pendants.

#### **Kenoyer, J. Mark and Massimo Vidale**

1992 A New Look at Stone Drills of the Indus Valley Tradition. In *Materials Issues in Art and Archaeology, III*, edited by P. Vandiver, J.R. Druzick, G.S. Wheeler, and I. Freestone, pp. 495-519. Materials Research Society Proceedings 267.

Summarizes the state of drilling research and defines two categories of drills that were used in antiquity: tapered cylindrical drills and constricted cylindrical drills. Directions for future research on the relationship between drilling and other contemporaneous technologies are discussed. India, Pakistan.

#### **Kenoyer, J. Mark, M. Vidale, and K.K. Bhan**

1991 Contemporary Stone Beadmaking in Khambhat, India: Patterns of Craft Specialization and Organization of Production as Reflected in the Archaeological Record. *World Archaeology* 23(1):44-63.

Presents preliminary results of ethno-archaeological and experimental studies of the stone-bead industry of Khambhat.

1994 Carnelian Bead Production in Khambhat, India: An Ethnoarchaeological Study. In *Living Traditions: Studies in the Ethnoarchaeology of South Asia*, edited by Bridget Allchin, pp. 281-306. Oxbow and IBH Publishing, New Delhi.

**Kleijne, J.P., O. Brinkkemper, R.C.G.M. Lauwerier, B.I. Smit & E.M. Theunissen (eds.)**

2013 *A Matter of Life and Death at Mienakker (the Netherlands): Late Neolithic Behavioural Variability in a Dynamic Landscape*. Nederlandse Archeologische Rapporten 45.

Among other things, this report deals with the production of amber beads.

**Konasukawa, Ayumu, Hitoshi Endo, and Akinori Uesugi**

2011 Chapter 7. Minor Objects from the Settlement Area. In *Excavations at Farmana: District Rohtak, Haryana, India, 2006-08*, edited by V. Shinde, T. Osada, and M. Kumar, pp. 369-526. Indus Project, Research Institute for Humanity and Nature, Kyoto.

The site yielded a wide variety of beads but especially those of terra cotta and various types of stone. They are attributed to the Harappan and Historical periods. Includes information regarding the drilling technology used based on silicone casts of the perforations.

**Kovacevich, Brigitte**

2011 The Organization of Jade Production at Cancuen, Guatemala. In *The Technology of Maya Civilization: Political Economy and Beyond in Lithic Studies*, edited by Zachary X. Hruby, Geoffrey E. Braswell, and Oswaldo Chinchilla Mazariegos, pp. 149-161.

Combines ethnographic, ethnohistorical, and archaeological data to identify, describe, and interpret the material correlates and social processes surrounding the production of jade beads and other ornaments at a Late Classic Maya site in Guatemala.

**Krzyżanowska, Marta and Mateusz Frankiewicz**

2017 “Paciorki mozaikowe w otwartym palenisku?” Kontynuacja badań / Mosaic Beads in an Open Hearth. Continued Research. *Slavia Antiqua* LVIII:41-54.

Experiments were conducted to determine if Early Medieval Scandinavian beadmakers were capable of crafting complex mosaic glass beads. In Polish with English abstract.

**Law, Randall**

2018 The Art of the Harappan Microbead - Revisited. In *Walking with the Unicorn: Social Organization and Material Culture in Ancient South Asia. Jonathan Mark Kenoyer Felicitation Volume*, edited by Dennys Frenez, Gregg M. Jamison, Randall W. Law, Massimo Vidale, and Richard H. Meadow, pp. 327-342. Archaeopress, Summertown, Oxford, UK.

New observations of steatite microbeads from Zhekhada in northern Gujarat, India, strongly suggests that Harappan craftspeople made the beads by cutting, drilling, and grinding solid steatite rock rather than by forming them from a ground steatite paste as was previously thought.

**Ludvik, Geoffrey**

2012 Stone Beads of Ancient Afghanistan: Stylistic and Technical Analysis. *Field Notes: A Journal of Collegiate Anthropology* 3(1):1-8.

This study addresses antique stone beads made of agate, carnelian, turquoise, jasper, and lapis lazuli, and focuses on stylistic and morphological features as well as manufacturing techniques, specifically the nature of drilling used to perforate the beads.

**Ludvik, Geoffrey, J. Mark Kenoyer, Magda Pieniżek, and William Aylward**

2015 New Perspectives on Stone Bead Technology at Bronze Age Troy. *Anatolian Studies* 65:1-18. Eighteen carnelian and two rock-crystal beads from the site of Troy, Turkey, were studied to better understand lapidary technology and trade during the 3rd-2nd millennium BC in this part of Anatolia.

**Ludvik, Geoffrey, Magda Pieniżek, and J.M. Kenoyer**

2014 Stone Bead-Making Technology and Beads from Hattuša: A Preliminary Report. In *Die Arbeiten in Boğazköy-Hattuša 2013*, edited by A. Schachner, pp.147-153. *Archäologischer Anzeiger* 2014/1.

The beads uncovered at Hattuša, the capital of the Hittite Empire during the late Bronze Age in what is now Turkey, were manufactured from soft stones, like serpentine or limestone, as well as hard stones such as lapis lazuli, rock crystal, and variations of chalcedony such as agate, carnelian, and onyx.

**Lume Pereira, Federica, Giuseppe Guida, Ulrike Müller, and Massimo Vidale**

2017 The Bead-Maker's Toolkit: The Circulation of Drilling Technologies and Gemstones in the "Middle Asian Interaction Sphere." In *The Exploitation of Raw Materials in Prehistory: Sourcing, Processing and Distribution*, edited by Telmo Pereira, Xavier Terradas, and Nuno Bicho, pp. 520-537. Cambridge Scholars Publishing, Newcastle upon Tyne.

Addresses technological transmission in the context of newly established exchange mechanisms of the Early Bronze Age in the Near East and South Asia by focusing on a number of beads recovered from Gonur Depe (Turkmenistan) – the best known urban center of the so-called Oxus civilization (BMAC).

**Maury, J.**

1986 Des Mèches à foret pour la fabrication des perles chalcolithiques sur le site de Camprouch (Caylar, Hérault). *Travaux de l'Institut d'Art Préhistorique* XXVIII:131-137.

Discusses stone drill bits for perforating necklace beads at Camprouch, a Chalcolithic site in southern France.

**Mazzieri, Paola and Roberto Micheli**

2007 Parma-Benefizio, struttura 11: resti di un atelier di lavorazione dei vaghi di collana in steatite del Neolitico medio. *Padusa* XLIII, n.s.:7-23.

Reports on the existence of a steatite disk bead workshop at a Middle Neolithic settlement in northern Italy during the Square Mouthed Pottery phase. The recovered material allows the complete reconstruction of the disk bead manufacturing sequence.

**Melgar Tísoc, Emiliano R. and Iris del Rocío Hernández Bautista**

2013 La lapidaria en el Nevado de Toluca. Tipología y tecnología. In *Bajo el Volcán. Vida y ritualidad en torno al Nevado de Toluca*, edited by Silvina Vigliani and Roberto Junco, pp. 125-151. Instituto Nacional de Antropología e Historia, México, D.F.

Discusses the typology and technology of lapidary objects (including beads) recovered at Nevado de Toluca, Mexico.

**Menon, Jaya**

2014 The Transmission of Craft Technologies in the Bronze Age. *Studies in People's History* 1, 2: 127-141. DOI: 10.1177/2348448914549894.

This article looks at different drilling technologies in the Bronze Age from Egypt to the Indian subcontinent. The adoption or rejection of different types of drilling mechanisms in different regions reminds us that technologies have to be socially acceptable in the first place before they could be adopted.

**Miller, Heather M.-L.**

2008 The Indus Talc-Faience Complex Types of Materials: Clues to Production. In *South Asian Archaeology 1999, Proceedings of the Fifteenth International Conference of the European Association of South Asian Archaeologists, Universiteit Leiden, 5-9 July, 1999*, edited by Ellen M. Raven, pp. 111-122. Egbert Forsten, Groningen.

The classification of talc-faience complex materials is difficult as they are almost identical in appearance even under low magnification. This article provides comparative, descriptive terminology for these various materials which should facilitate more uniform descriptions in the future. Also provided is an overview of the probable processes of the manufacture of these materials and the objects created from them.

**Mohanty, R.K. and Tilok Thakuria**

2016 *Indian Beads: History and Technology*. Pentagon Press, New Delhi.

Provides a detailed account of non-glass bead manufacture and trade in India from the upper paleolithic to early history. Includes information about manufacturing techniques, raw materials, and manufacturing centers in ancient India, as well as traditional bead manufacturing at Khambat, Gujarat.

**Moorey, P.R.S.**

1994 *Ancient Mesopotamian Materials and Industries: The Archaeological Evidence*. Eisenbrauns, Winona Lake, IN.

The chapter on “The Stoneworking Crafts: Ornamental Stones” contains a section on beads and the types of stones used to produce them.

**Needham, Andy, Aimée Little, Chantal Conneller, Diederik Pomstra, Shannon Croft, and Nicky Milner**

2018 Beads and Pendant. In *Star Carr. Volume 2: Studies in Technology, Subsistence and Environment*, edited by Nicky Milner, Chantal Conneller, and Barry Taylor, pp. 463-477. White Rose University Press, York.

Chapter 33 discusses the small group of ornaments recovered from the important Mesolithic site of Star Carr in North Yorkshire, England, United Kingdom. They include shale disc beads, a possible bird-bone bead, a perforated amber fragment, perforated red deer teeth, and a unique, engraved shale pendant which represents the earliest form of Mesolithic art in Britain. Insight is provided regarding the manufacture of the ornaments.

**Nguyen Kim Dung**

1996 The Trang Kenh Jewellery Workshop Site: An Experimental and Microwear Study. *Indo-Pacific Prehistory Association Bulletin* 14:161-165.

The microwear observations on tools, finished nephrite ornaments (including beads), and waste material from the Bronze Age site of Trang Kenh, Vietnam, supported by experiments, indicate a rather high level of development using quite complex tools for jewelry manufacture during the late 2nd millennium BC in northern Vietnam.

**Noain Naura, María José**

1996 Las cuentas de collar en variscita de las Minas Prehistóricas de Gavà (Can Tintorer), bases para un estudio experimental. *CuPAUAM* 23:37-86.

Reconstructs the manufacturing sequence for Neolithic variscite necklace beads in the province of Barcelona, Spain.

1997 El proceso de fabricación de las cuentas de collar en variscita. *Boletín de Arqueología Experimental* 1:10-11.

Describes the process for making variscite necklace beads.

**Pelegrin, J.**

2000 Technique et méthodes de taille pratiquées à Cambay. In *Cornaline de l'Inde: des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by V. Roux, pp. 53-93. Éditions de la Maison des sciences de l'homme, Paris.

Expounds on the stone-bead knapping methods and techniques practiced at Cambay, India.

**Popkiewicz, Eryk**

2016 Jakimi sposobami i narzędziami obrabiano paciorki bursztynowe z obiektów obrzędowych Pucharów Dzwonowatych z Supraśla / Techniques and Tools Used for Processing Amber Beads from Bell Beaker Ritual Features Located in Supraśl. In *Studia i Materiały do Badań nad Neolitem i Wczesną Epoką Brązu na Mazowszu i Podlasiu VI*, edited by Ryszard F. Mazurowski, Dariusz Manasterski, and Katarzyna Januszek, pp. 53-74. Instytut Archeologii Uniwersytetu Warszawskiego, Warsaw.

Replicative experimentation revealed that the tools used to process amber beads excavated in northeastern Poland were made of metal, most likely copper alloys. In Polish with substantial English abstract.

**Prabhakar, V.N.**

2017 Documentation and Analysis of Stone Drills from Dholavira. In *Stone Beads of South and Southeast Asia: Archaeology, Ethnography and Global Connections*, edited by Alok Kumar Kanungo, pp. 293-316. Indian Institute of Technology, Gandhinagar.

**Prabhakar, V.N., R.S. Bisht, R.W. Law and J.M. Kenoyer**

2012 Stone Drill Bits from Dholavira – A Multi-Faceted Analysis. *Man and Environment* XXXVII(1): 8-25.

A detailed study of the large collection of Harappan drill bits excavated at Dholavira, Gujarat, India, which were used in the production of stone beads. Mostly made of “Ernestite,” the drills played a major role in the advancement of technology in the perforation of beads made of siliceous materials.

**Queffelec, Alain, Pierrick Fouéré, Céline Paris, Christian Stouvenot, and Ludovic Bellot-Gurlet**

2018 Local Production and Long-Distance Procurement of Beads and Pendants with High Mineralogical Diversity in an Early Saladoid Settlement of Guadeloupe (French West Indies). *Journal of Archaeological Science: Reports* 21:275-288.

Presents an integrated study of the mineralogy and typo-technology of the ornaments which date to 250-400 cal. AD. The materials used include serpentine, amethyst, turquoise, sudoite, rock crystal, calcite, feldspar, diorite, jasper, aventurine, chlorite, paragonite, and nephrite. Production waste represents several stages of the chaîne opératoire.

**Quinn, Colin Patrick**

2006 Vital Signs: Costly Signaling and Personal Adornment in the Near Eastern Early Neolithic. M.A. thesis. Department of Anthropology, Washington State University, Pullman.

Discusses stone bead production techniques during the Early Neolithic in the Southern Levant at the site of Dhra', Jordan, with emphasis on hole drilling.

**Raad, Danielle**

2015 The Production of Stone Beads at the Pre-Pottery Neolithic Site of el-Hemmeh, Jordan. S.M. thesis. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge.

Patterns of typology, color, and material are systematically explored, and manufacturing methods are reconstructed based on the close examination of perforations, polishing, and tool marks on ten PPNA beads carefully selected as case studies.

**Ricou, Christian, Thimus Esnard, and Luc Laporte**

2009 Archéologie expérimentale: Éléments de comparaison ethnographiques et archéologiques / Experimental archeology: Elements for Comparing Ethnographic and Archaeological Data. In *Des premiers paysans aux premiers métallurgistes sur la façade atlantique de la France (3500-2000 av. J.-C.) / From the First Farmers to the First Metallurgists on the French Atlantic Coast (3500-2000 cal. B.C.)*, edited by Luc Laporte, pp. 506-520. Édition Association des Publications Chauvinoises, Mémoire XXXIII.

Reports on the experimental replication of stone and shell beads found on Artenacian sites in west-central France.

**Rigaud, Solange and Veerle Rots**

2018 Analyse microscopique de quatre perles provenant de la tombe T.200 (N° 26) de Chagar Bazar (Syrie). In *Chagar Bazar (Syrie) VIII. Les Tombes Ordinaires de l'Âge Du Bronze Ancien et Moyen Des Chantiers D-F-H-I (1999-2011). Études Diverses*, edited by Önhan Tunca and Abd el-Massih Baghdo, pp. 149-154. Peeters, Leuven, Belgium.

A microscopic examination of four talc beads from a tomb in Syria dated to the early Bronze Age (ca. 2800-2000 / 2700-1900 BC) reveals the chaîne opératoire.

**Rochette, Erick T.**

2007 *Investigación sobre Producción de Gienas de Prestigio de Jade en el Valle Medio del Motagua, Guatemala*. Foundation for the Advancement of Mesoamerican Studies, Los Angeles.

Archaeological surveys and excavations were conducted in the Middle Motagua Valley of southern Guatemala, centering on the region around the Lower Lato River Valley, to understand the distribution, organization, and technological process of jadeite artifact production (primarily beads). English abstract.

2009 The Late Classic Organization of Jade Artifact Production in the Middle Motagua Valley, Zacapa, Guatemala. Ph.D. dissertation. Department of Anthropology, Pennsylvania State University, State College, PA.

The archaeological evidence demonstrates widespread production of jade artifacts in the only positively identified jade source for prehispanic Mesoamerica. Discusses the technology involved.

2010 Jade in Full: Prehispanic Domestic Production of Wealth Goods in the Middle Motagua Valley, Guatemala. In *Housework Craft Production and Domestic Economy in Ancient Mesoamerica*, edited by Kenneth G. Hirth, pp. 205-224. Archeological Papers of the American Anthropological Association 19.

Presents evidence for non-elite, household production of jadeite items (particularly beads) in the study area.

**Rodet, M.J., D. Duarte-Talim, and C.G. Falci**

2014 A produção de contas líticas na Amazônia a partir da perspectiva teórico-metodológica da Escola Francesa clássica (exemplo da Serra dos Carajás, Pará). In *Indústrias Líticas na América do Sul: Abordagens teóricas e metodológicas*, edited by A. Lourdeau, S. Viana, and M.J. Rodet. Editora da UFPE, Recife, Brazil.

The production of stone beads in the Amazon at Serra dos Carajás, Pará, Brazil, from the theoretical and methodological perspective of the classical French School.

**Rodet, M.J., D. Duarte-Talim, M.I. da Silveira, E.R. de Oliveira, and M.L. da Costa**

2014 The Production of Beads and Lithic Pendants in the Salobo River Basin, Pará, Brazil. In *Traceology Today: Methodological Issues in the Old World and the Americas*, edited by M.E. Mansur, M.A Lima, and Y. Maigrots, pp. 61-68. BAR International Series 2643.

**Rollefson, Gary**

2002 Bead-Making Tools from LPPNB al-Basit, Jordan. *Neo-Lithics* 2/02:5-7.

By analogy with other settlements in the Levant, the presence of large numbers of drills at al-Basit argues for a bead industry despite the glaringly small number of ornaments that have been recovered.

**Rollefson, Gary and M. Parker**

2002 Craft Specialization at al-Basit, Wadi Musa, Southern Jordan. *Neo-Lithics* 1/02:21-23.

Analysis of material recovered from the large LPPNB settlement at al-Basit, near Petra in southern Jordan, demonstrates a focus on drill production, ostensibly for the manufacture of beads.

**Roux, Valentine**

2000 Contexte historique et ethnographique / Historical and Ethnographical Context. In *Cornaline de l'Inde: des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by V. Roux, pp. 19-50. Éditions de la Maison des sciences de l'homme, Paris.

Presents a historical and ethnographical introduction to the Cambay stone-bead industry including a synopsis of manufacturing techniques; India. English abstract.

**Roux, Valentine (ed.)**

2000 *Cornaline de l'Inde: Des pratiques techniques de Cambay aux techno-systèmes de l'Indus*. Éditions de la Maison des sciences de l'homme, Paris.

Contains nine articles on various aspects of beadmaking technology in the Indus Valley of India and Pakistan, as well as related topics. The nine articles are listed individually in the respective sections of this bibliography.



**Roux, V., B. Bril, and G. Dietrich**

1995 Skills and Learning Difficulties Involved in Stone Knapping: The Case of Stone-Bead Knapping in Khambhat, India. *World Archaeology* 27(1):63-87.

New methods of recording manufacturing processes throw light on the makers of long carnelian beads and their high value in the Harappan civilization.

**Roux, V. and P. Matarasso**

1999 Crafts and the Evolution of Complex Societies: New Methodologies for Modeling the Organization of Production, a Harappan Example. In *The Social Dynamics of Technology: Practice, Politics, and World Views*, edited by M.-A. Dobres and C.R. Hoffman, pp. 46-70. Smithsonian Institution Press, Washington.

Harappan stone-bead technology; Pakistan and India.

2000 Les perles en cornaline harappéenne, pratique technique et techno-système. In *Cornaline de L'Inde: Des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by V. Roux, pp. pp. 413-438. Éditions de la Maison des sciences de l'homme, Paris.

On the technology of Harappan carnelian beads; Pakistan, India.

**Roux, V. and J. Pelegrin**

1989 Taille des perles et spécialisation artisanale: enquête ethnoarchéologique dans le Gujarat. *Techniques et Cultures* 14:23-49.

An ethno-archaeological investigation of stone-bead production in Gujarat, India.

**Salvatori, S., M. Vidale, G. Guida, and E. Masioli**

2009 Ilgynly-Depe (Turkmenistan) and the 4th Millennium BC Metallurgy of Central Asia. *Paléorient* 35(1):47-67.

Surface finds include a number of copper beads as well as a silver example. Their production and composition are discussed.

**Sax, Margaret and Nigel Meeks**

2009 The Manufacture of a Small Crystal Skull Purported to be from Ancient Mexico. *British Museum Technical Research Bulletin* 3:47-55.

Close examination of the techniques used in the production of a small perforated quartz skull reveal that the object is not pre-Columbian but was made between the late 16th century and the mid-19th century when it was acquired.

**Seeberger, F.**

1992 Zur Herstellung der neolithischen Kalkröhrenperlen und Kettenschieber. *Archäologisches Korrespondenzblatt* 22:41-45.

Neolithic working debris and flint drills from a site on Lake Constance, Germany, inspired experiments in reconstructing stone-bead manufacture using flint bits and a bow drill. Calculations about the time required suggest that only the upper levels of society could afford beads.

**Sela, A. and V. Roux**

2000 La perforation des perles en calcédoine: approche mécanique des techniques harappéennes. In *Cornaline de l'Inde. Des pratiques techniques de Cambay aux techno-systèmes de l'Indus*, edited by V. Roux, pp. 173-204. Éditions de la Maison des sciences de l'homme, Paris.

A technical approach to perforating Harappan chalcedony beads; India.

**Shinohara, Yūichi**

2011 Stone Ritual Items and the Stones of Okinoshima Island in the Fifth Century. In *Okinoshima Island and Related Sites in the Munakata Region, Study Report I*, pp. 435-489. World Heritage Promotion Committee of Okinoshima Island and Related Sites in the Munakata Region, Fukuoka, Japan.

The ritual items include beads in comma-shaped, cylindrical, round, disc, and mortar-shaped forms. Thorough report which includes information about manufacturing techniques and chronology.

**Stocks, Denys A.**

1989 Ancient Factory Mass-Production Techniques: Indications of Large-Scale Stone Bead Manufacture during the Egyptian New Kingdom Period. *Antiquity* 63(240):526-531.

Among the craftworkers depicted in Egyptian tomb-painting are drillers of beads going about their work. An experimental study of bead-drilling leads to an assessment of the industrial nature of the enterprise.

2003 *Experiments in Egyptian Archaeology: Stoneworking Technology in Ancient Egypt*. Routledge, London.

A very illuminating book with a whole chapter devoted to early beadmaking techniques. Detailed discussion of the mass-production techniques depicted in Egyptian tombs and then of the author's attempts to replicate them (pp. 203-224). The most highly skilled workers could produce up to five beads at a time. Other parts of the book deal with drills, abrasives, etc.

**Strafella, A., I. Angelini, G. Guida, S. Ferrari, M. Cupitò, M.R. Giuliani, and M. Vidale**

2017 Micromorphologies of Amber Beads: Manufacturing and Use-Wear Traces as Indicators of the Artefacts' Biography. *Praehistorische Zeitschrift* 92(1):144-160.

Microscopic examination of a group of Bronze-Age amber beads from two different sites in northern Italy revealed the use of a red-hot punch for creating the perforations.

**Takács, József**

2016 Gemstone Objects from Burma: Gemmological Tests and Investigation of Production Technology. In *Burmese Gemstone Amulets and Talismans, Vol. 1*, edited by Terence Tan, Susan Conway, József Takács, and István Zelnik, pp. 30-41. Hungarian Southeast Asian Research Institute, Budapest.

A thousand or so Burmese gemstone objects at the Department of Mineralogy of the Eötvös Loránd University and at the Hungarian Southeast Asian Research Institute were examined to identify the materials used, establish the techniques used in their production, and determine whether they are authentic, ancient pieces.

**Thakuria, T. and R.K. Mohanty**

2010 A Stone Bead Manufacturing Centre in Peninsular India: Preliminary Study of Manufacturing Debitage from Trench F of Mahurjhari Excavations, Maharashtra. *Tamil Civilization* 23:15-38.

**Tosi, M. and M. Vidale**

1990 4th Millennium BC Lapis Lazuli Working at Mehrgarh, Pakistan. *Paléorient* 16(2):89-99.  
Describes the lapis lazuli industry at Mehrgarh based on material surface collected at site MR2 which dates to the 4th millennium B.C. This find represents one of the earliest lapis lazuli beadmaking assemblages in South Asia and shows the involvement of the Kachi Plain region in the production of luxury ornaments since comparatively ancient periods.

**Uesugi, Akinori, Manmohan Kumar, and Vivek Dangi**

2018 Indus Stone Beads in the Ghaggar Plain with a Focus on the Evidence from Farmana and Mitathal. In *Walking with the Unicorn: Social Organization and Material Culture in Ancient South Asia. Jonathan Mark Kenoyer Felicitation Volume*, edited by Dennys Frenez, Gregg M. Jamison, Randall W. Law, Massimo Vidale, and Richard H. Meadow, pp. 568-591.  
Archaeopress, Summertown, Oxford, UK.

Presents a thorough analysis of the stone beads recovered from two Urban Indus sites in northern India, including a reconstruction of the bead production process.

**Uesugi, Akinori and Wannaporn Kay Rienjang**

2018 Stone Beads from Stupa Relic Deposits at the Dharmarajika Buddhist Complex, Taxila.  
*Gandhāran Studies* 11:53-83.

Silicone casts made of the perforations of stone beads recovered from an early 1st millennium site in northern Pakistan provide information concerning the various drilling techniques used.

**van Gijn, Annelou**

2006 Ornaments of Jet, Amber and Bone. In *Schipluiden: A Neolithic Settlement on the Dutch North Sea Coast c. 3500 cal BC*, edited by L.P. Louwe Kooijmans and P.F.B. Jongste, pp. 195-205.  
*Analecta Praehistorica Leidensia* 37/38.

Discusses the beads and their production techniques.

2008 De ornamenten van Ypenburg. In *Ypenburg-locatie 4. Een nederzetting met grafveld uit het Midden-Neolithicum in het West-Nederlandse kustgebied*, edited by Hans Koot, Lauren Bruning, and Rob A. Houkes, pp. 277-288. Hazenberg Archeologie, Leiderdorp.

Discusses the amber and jet beads recovered from a Middle Neolithic site in the western Netherlands with an account of production techniques.

2013 Ornaments of Jet, Amber and Bone. In *Schipluiden: A Neolithic Settlement on the Dutch North Sea Coast c. 3500 CAL BC*, edited by Leendert P. Louwe Kooijmans and Peter F.B. Jongste, pp. 195-205. *Analecta Praehistorica Leidensia* 37/38.

Includes a description of stone beadmaking technology.

2014 Beads and Pendants of Amber and Jet. In *A Mosaic of Habitation at Zeewijk (the Netherlands): Late Neolithic Behavioural Variability in a Dynamic Landscape*, edited by E.M. Theunissen et al., pp. 119-127. *Nederlandse Archeologische Rapporten* 47.

On the manufacturing sequence of locally made amber and jet beads recovered from a Late Neolithic site in Zeewijk, the Netherlands.

**Vidale, Masimo**

1995 Early Beadmakers of the Indus Tradition: The Manufacturing Sequence of Talc Beads at Mehrgahr in the 5th Millennium BC. *East and West* 45(1-4):45-80.

Reconstructs the techniques used by ancient artisans to make steatite disc beads, Pakistan. Excellent illustrations and SEM photos.

**Viola, Stefano**

2016 Significato sociale della *parure* in pietra tra l'età del Rame e il Bronzo Antico dell'Italia settentrionale. Un approccio tecno-funzionale attraverso la sperimentazione archeologica. D.Sc. thesis. University of Geneva.

On the social meaning of stone jewelry (including beads and pendants) from sites in northern Italy dating from the Copper to Early Bronze ages. Includes a detailed account of the manufacturing processes.

**Viola, Stefano, Maria Adelaide Bernabo' Brea, Dino Delcaro, Federica Gonzato, Cristina Longhi, Giorgio Gaj, Roberto Macellari, Luciano Salzani, Alessandra Serges, James Tirabassi, and Marie Besse**

2017 Types and Gesture. The Jewellery of the Copper Age in the Alps in a Techno-Typological Study. In *Materials, Productions, Exchange Network and their Impact on the Societies of Neolithic Europe*, edited by Marie Besse and Jean Guilaïne, pp. 69-82. Archaeopress Publishing, Oxford.

Compares jewelry artifacts (mainly stone beads) from sites in northern Italy dating from the Copper Age to the Early Bronze Age to determine the technology and tools used to produce them, as well as how to differentiate wear marks from technological traces.

**Wartke, R.-B.**

1991 Handwerk und Technologie im Alten Orient. 1. Teil: Ver- und Bearbeitung von Ton und Stein. 2. Teil: Ver- und Bearbeitung von Metall und Glas. *Antike Welt* 22:35-48, 82-96.

Succinct account of the techniques for making stone beads (shaping, boring, etching) in the ancient Orient, and some remarks pertinent to beadmaking in metal and various vitreous materials.

**Williams, L.**

1984 *A New Approach to the Study of Bead-Making Workshop Practices with Special Reference to Carnelian and Agate Beads from Ban Don Ta Phet, Thailand*. University of London, Institute of Archaeology.

Stone bead technology.

**Wright, Katherine I. (Karen)**

2008 Craft Production and the Organisation of Ground Stone Technologies. In *New Approaches to Old Stones: Recent Studies of Ground Stone Artefacts*, edited by Y. Rowan and J. Ebeling, pp. 130-143. Equinox Archaeology, London.

Discusses the massive evidence for the production of beads made of green, red, and black "Dabba marble" at the Late Neolithic sites of Jilat 13 and 25 in eastern Jordan.

**Wright, K.I., P. Critchley, A.N. Garrard, R. Bains, D. Baird, and S. Groom**

2008 Stone Bead Technologies and Early Craft Specialization: Insights from Two Neolithic Sites in Eastern Jordan. *Levant* 40(2):131-165.

Stone bead production and exchange in Wadi Jilat and the Azraq Basin, Jordan.

**Wright, Katherine I. and Andrew Garrard**

2003 Social Identities and the Expansion of Stone Bead-Making in Neolithic Western Asia: New Evidence from Jordan. *Antiquity* 77(296):267-284.

Discusses evidence for stone bead production and use at six seasonally occupied aceramic neolithic campsites in the Wadi Jilat region of eastern Jordan. Most of the beads were made from a local colored stone, so-called "Dabba Marble," but varieties of flint, silicified sandstone, white limestone/chalk, white quartz/calcite were also used. Long-distance imports were limited to two beads of malachite and turquoise, and a small number of Red Sea shells and mother-of-pearl beads.

**Yang, Y., M. Yang, Y. Xie, and C. Wang**

2008 Application of Micro-CT: 3D Reconstruction of Tool Marks on an Ancient Stone Bead and its Implication for Jade Drilling Techniques. In *Proceedings of the 37th International Symposium on Archaeometry, 13th-16th May 2008, Siena, Italy*, edited by Isabella Turbanti-Memmi, pp. 343-347. Springer.

The specimen examined is a black stone beads from a tomb of the "Peng" Nation, Western Zhou Dynasty (1046-771 BC).

**SHELL**

**André, Lino**

2016 Análise das técnicas de perfuração e evidências de uso dos adornos da "Vala" (Cabeço da Amoreira, Muge). *Magos: Revista cultural do concelho de salvaterra de Magos* 3:3-24.

Provides information regarding perforation techniques and use wear on Mesolithic adornments (primarily beads) from the Cabeço da Amoreira shell midden at Muge, central Portugal. The same content as the next entry.

**André, Lino António and Nuno F. Bicho**

2016 Perforation Techniques and Traces of Use on the Mesolithic Adornments of the Trench Area at Cabeço da Amoreira Shellmidden (Muge, Central Portugal). *Comptes Rendus Palevol* 15(5):569-580.

Discusses a set of personal adornments made of gastropod shells (beads included), a cervid tooth, and a clay ring fragment. Includes a description of the objects, their distribution in the archaeological context, the techno-typological analysis of the perforations, and the evidence for their use as adornments.

**Arnold, Jeanne E. and Diana Rachal**

2002 The Value of Pismo Clam Tube Beads in California: Experiments in Drilling. *North American Archaeologist* 3(3):187-207.

Illustrated study of experiments in drilling and other technological aspects of aboriginal production of shell beads along the Pacific coast of California.

**Avezuela Aristu, B.**

2010 The Personal Ornaments Made from Molluscs at the Middle-Late Magdalenian Site of La Peña de Estebanvela (Segovia, Spain). In *Not only Food: Marine, Terrestrial and Freshwater Molluscs in Archaeological Sites*, edited by E. Álvarez-Fernández and D. Carvajal-Contreras, pp. 48-56. Munibe Suplemento 31.

The ornament collection from the site contains six species of marine molluscs, one freshwater mollusc, and three red deer atrophied canines, all of them perforated. A technological study of the perforations was undertaken on the molluscs and an experimental comparative collection created.

**Avezuela Aristu, B., I. Martín Lerma, J.A. Marín de Espinosa, and F.J. Muñoz Ibáñez**

2011 Los adornos-colgantes en el Paleolítico Superior: experimentación sobre las perforaciones en *Littorina obtusata*. In *La investigación experimental aplicada a la Arqueología*, edited by A. Morgado, J. Baena Preysler, and D. Garcia Gonzalez, pp. 263-269. Imprento Galindo, Ronda, Málaga.

Investigates how a certain species of shell was perforated to form ornaments during the Upper Paleolithic period.

**Bar-Yosef Mayer, Daniella E.**

2014 Temporal Changes in Shell Bead Technologies Based on Levantine Examples. In *Archaeomalacology: Shells in the Archaeological Record*, edited by Katherine Szabó, Catherine Dupont, Vesna Dimitrijević, Luis Gómez Gastélum, and Nathalie Serrand, pp. 91-100. BAR International Series 2666.

**Basilia, Pauline A.**

2012 Traded Technology: The Development of the Shell Bead Manufacturing Tradition in the Ille Site, El Nido, Philippines Bead Assemblage. <https://www.academia.edu/1839047/>, accessed 12 June 2017.

2014 Examining Residue Morphology of the Microperforated Cut Shell Beads from Ille Site, El Nido Palawan. *Proceedings of the Philippine Association of Microscopists, Annual Scientific Conference and General Assembly* 7:40-43.

SEM examination of shell beads from a Philippine Metal Age site revealed that a number of them exhibited appliques of black, yellow, red, and high-fiber substances.

**Benghiat, Samuel, Darko Komšo, and Preston T. Miracle**

2009 An Experimental Analysis of Perforated Shells from the Site of Šebrn Abri (Istria), Croatia. In *Mesolithic Horizons. Papers Presented at the Seventh International Conference on the Mesolithic in Europe, Belfast, 2005*, Vol. 2, edited by Sinéad McCartan, Rick Schulting, Graeme Warren, and Peter Woodman, pp. 730-736. Oxbow Books, Oxford.

This article focuses on using experimental archaeology to reconstruct the mode of production of a sample of perforated *Columbella rustica* shells from an Early Holocene upland camp in Croatia.

**Blake, Michelle**

2010 Drill Baby, Drill! An Analysis of Late Period Chumash Microdrills from CA-SLO-214. M.A. thesis. Sonoma State University, Rohnert Park, CA.

Presents a study of Chumash shell beads and the microdrills used to produce them in southern California.

**Campbell, Greg**

2017 The Reproduction of Small Prehistoric Tusk Shell Beads. In *Not Just for Show: The Archaeology of Beads, Beadwork and Personal Ornaments*, edited by Daniella E. Bar-Yosef Mayer, Clive Bonsall, and Alice M. Choyke, pp. 168-?. Oxbow Books, Oxford and Philadelphia.

Uses replication experimentation to demonstrate how very short (1-3 mm) tusk-shell beads were made during the Epipaleolithic of the Levant.

**Camps-Fabrer, Henriette (ed.)**

1991 *Fiches typologiques de l'industrie osseuse préhistorique, cahier IV: objets de parure.*  
Publications de l'Université de Provence, Aix-en-Provence.

A typology for prehistoric bone, shell, and ivory ornaments, including beads, spacers, and pendants. Information concerning production techniques, use/wear, and spacial and temporal distribution is also provided.

**Cargill, Sydney, Isha Chavva, Shannon Duffy, Julia Flores, Jennifer Mao, Gabrielle Shvartsman, Cindy Weng, and Sharmitha Yerneni**

2015 The Guangala and Manteño-Huancavilca Shell Ornament Production Methods. Drew University, [www.drew.edu/govschool/wp-content/uploads/.../T6-Final-Paper.docx](http://www.drew.edu/govschool/wp-content/uploads/.../T6-Final-Paper.docx), accessed 18 Dec. 2016.

Investigates and compares the methods used to produce Spondylus-shell beads in two Ecuadorian cultures.

**Carter, Benjamin**

2008 Technology, Society and Change: Shell Artifact Production among the Manteño (A.D. 800-1532) of Coastal Ecuador. Ph.D. dissertation. Department of Anthropology, Washington University, Saint Louis, Missouri.

Presents a thorough study of Manteño shell bead production based on a large collection of material recovered from six sites in two geographically and temporally different groups: the southern portion of modern-day Manabí province and from the Santa Elena Peninsula; and Late Guangala/Early Manteño (ca. AD 700-1300) and Late Manteño (ca. AD 1200-post 1532).

**Carter, Benjamin and Matthew Helmer**

2015 Elite Dress and Regional Identity: Chimú-Inka Perforated Ornaments from Samanco, Nepeña Valley, Coastal Peru. *Beads: Journal of the Society of Bead Researchers* 27:46-74.

Contains information regarding the techniques utilized in the production of the perforated shell and stone ornaments recovered from a Chimú-Inka period (ca. 1470-1532) elite tomb at Samanco, Peru.

**Carter, Robert, Harriet Crawford, Simeon Mellalieu, and Dan Barrett**

1999 The Kuwait-British Archaeological Expedition to as-Sabiyah: Report on the First Season's Work. *Iraq* 61:43-58.

Flint microdrills found with finished and unfinished shell disc beads confirm a bead manufacturing function for this small, coastal 5th-millennium site in Iraq.

**Ciarla, R., F. Rispoli, and P. Yukongdi**

2017 Shell Personal Ornaments Craft at the Site of Tha Kae, Lopburi Province, Central Thailand. Tracing the Southward Dispersal of the Drilling Technique. *Journal of Indo-Pacific Archaeology* 41:30-65.

Presents the manufacturing cycle for the three main shell-bead types recovered from a Bronze Age site (ca. 1100-500 BCE).

**Cooke, Richard. G and Luis A. Sánchez H.**

1997 Coetaneidad de Metalurgia, Artesanías de Concha y Cerámica Pintada en Cerro Juan Díaz, Panamá. *Boletín del Museo del Oro (Colombia)* 42:57-85.

Discusses shell bead and pendant manufacture at a prehispanic site in Panama.

**d'Errico, F., P. Jardón-Giner, and B. Soler-Mayor**

1993 Critères à base expérimentale pour l'étude des perforations naturelles et intentionnelles sur coquillages. In *Traces et Fonction. Les Gestes Retrouvés*, edited by P. Anderson, S. Beyries, M. Otte, and H. Plisson, pp. 243-254. Université de Liège, ERAUL 50.

Criteria for experiments to determine if holes in shells are natural or intentional.

**Feinman, Gary M. and Linda M. Nicholas**

1993 Shell-Ornament Production in Ejutla. *Ancient Mesoamerica* 4(1):103-119.

Reports on the production of shell beads and other adornments from Pacific Coast species during the Terminal Formative/Early Classic periods at a site in Oaxaca, Mexico.

1995 Household Craft Specialization and Shell Ornament Manufacture in Ejutla, Mexico. *Expedition* 37(2):14-25.

Discusses the production of pre-Hispanic marine-shell beads.

**Fernández, Mabel M. and Mariano Ramos**

2007 hallazgos especiales del sitio Casa de Piedra de Ortega, Provincia de Río Negro. *Anales de Arqueología y Etnología* 61-62:147-164.

The small finds from a site in northern Argentina include glass, bone, stone, and shell beads. Close examination of the shell objects helped to establish manufacturing techniques.

**Folb, L.**

1993 Marine Shell Beads and Microdrills in Early Woodland New York: Possible Connections between the Prehistoric Middlesex and Bushkill Complexes Suggested by the Analysis of Use-Wear on Microdrills. Unpublished Senior Project. Department of Anthropology, Bard College, Annandale-on-Hudson, New York.

**Francis, Peter, Jr.**

1989 The Manufacture of Beads from Shell. In *Proceedings of the 1986 Shell Bead Conference*, edited by Charles F. Hayes III, pp. 25-35. Rochester Museum and Science Center, Research Records 20.

Through experimentation, examination of excavated material, ethnographic observations, and a survey of the literature, techniques for making shell into beads have been identified. These techniques are discussed in their historical contexts, and means of identifying the techniques on archaeological/ethnographic material are discussed.

**Graesch, Anthony P.**

2004 Specialized Bead Making among Island Chumash Households: Community Labor Organization during the Historic Period. In *Foundations of Chumash Complexity*, edited by Jeanne E. Arnold, pp. 133-171. Perspectives in California Archaeology 7.

This study focuses on the socioeconomic contexts of Chumash household participation in specialized shellworking industries and the larger regional economy during the period from 1782 to 1819.



**Groman-Yaroslavski, Iris, Danny Rosenberg, and Dani Nadel**

2013 A Functional Investigation of Perforators from the Late Natufian/Pre-pottery Neolithic A Site of Huzuk Musa – A Preliminary Report. In *Stone Tools in Transition: From Hunter-Gatherers to Farming Societies in the Near East*, edited by Ferran Borrell, Juan José Ibáñez, and Miquel Molist, pp. 165-176. Universitat Autònoma de Barcelona, Servei de Publicacions.

Reports on the analysis of the large collection of flint perforators, shell beads, and bead production waste found at a site in Lower Jordan Valley Israel.

**Gruet, Yves, Luc Laporte, and Yves Bodeur**

2009 Objets de parure recueillis sur le site arténacien de Ponthezières / Objects of Ornament Collected on the Artenacian Site of Ponthezières. In *Des premiers paysans aux premiers métallurgistes sur la façade atlantique de la France (3500-2000 av. J.-C.) / From the First Farmers to the First Metallurgists on the French Atlantic Coast (3500-2000 cal. B.C.)*, edited by Luc Laporte, pp. 470-504. Édition Association des Publications Chauvinoises, Mémoire XXXIII.

Provides a detailed account of the beads fashioned from fresh and fossil shell and stone excavated at Ponthezières, France, along with a discussion of how they were produced.

**Guinea, Mercedes**

2006 Un sistema de producción artesanal de cuentas de concha en un contexto doméstico manteño: Japoto (provincia de Manabí, Ecuador). *Bulletin de l'Institut Français d'Études Andines* 35(3):299-312.

Discusses several hypotheses concerning the production of shell beads at Japoto, an archaeological habitation site of the Integration Period (AD 800-1535) in Ecuador.

2011 Artesanía doméstica de cuentas de concha en el Ecuador prehispánico: el montículo J4 de Japoto. *Estudios del hombre* 29:307-332.

The prehispanic J4 mound at Japoto, Ecuador, yielded evidence of the manufacture of shell beads. The article examines the technology, places of manufacture, and bead use.

**Guzzo Falci, Catarina, Annelou Van Gijn, M. Magdalena Antczak, Andrzej T. Antczak, and Corinne L. Hofman**

2017 Challenges for Microwear Analysis of Figurative Shell Ornaments from Pre-Colonial Venezuela. *Journal of Archaeological Science: Reports* 11:115-130.

Microwear analysis is used to assess technologies of production and use-wear of figurative shell ornaments from north-central Venezuela.

**Hartzell, Leslie L.**

1991 Archaeological Evidence for Stages of Manufacture of *Olivella* Shell Beads in California. *Journal of California and Great Basin Anthropology* 13:29-39.

The detailed study of shell bead production refuse enhances the ability of archaeologists to determine when and where particular bead types were manufactured.

**Harzhauser, Mathias, Eva Lenneis, and Christine Neugebauer-Maresch**

2007 Freshwater Gastropods as Neolithic Adornment: Size Selectiveness and Perforation Morphology as a Result of Grinding Techniques. *Annalen des Naturhistorischen Museums in Wien* 108 A:1-13.

Documents the methodology of perforating the shells of the fluvial gastropod *Lithoglyphus naticoides* based on experimental comparison. The study focuses on one “population” of piercings found in an early Neolithic (Linear Pottery Culture) grave in Kleinhadersdorf, Austria, to determine whether these artificial openings are a random product of grinding or whether the Neolithic craftsmen already tried to meet distinct parameters.

**Heit, Ilia**

2014 The Bead Workshop at Site MPS4, Mil Plain, Azerbaijan: Craft Specialization and the Manufacture of Shell Jewelry in the Neolithic. In *Beyond Ornamentation. Jewelry as an Aspect of Material Culture in the Ancient Near East*, edited by Amir Golani and Zuzanna Wygnańska, pp. 21-39. Polish Archaeology in the Mediterranean, Special Studies 23(2).

The archaeological remains indicate production of a distinct type of disc bead from one shell species of the genus *Didacna*. Moreover, they allow a closer look at manufacturing techniques and raise questions about craft specialization as well as the presence of a long tradition of shell jewelry in the Circumcaspien region.

**Henrickson, Celeste N.**

2013 The Archaeology of Cueva Santa Rita: A Late Holocene Rockshelter in the Sierra de la Giganta of Baja California Sur, Mexico. Ph.D. dissertation. Department of Anthropology, University of California, Berkeley.

Chapter 4 deals with the production of *Olivella* shell beads.

**Hohmann, Bobbi M.**

2002 Preclassic Maya Shell Ornament Production in the Belize Valley, Belize. Ph.D. dissertation. University of New Mexico, Albuquerque.

**Holley, George R.**

1995 Microliths and the Kunnemann Tract: An Assessment of Craft Production at the Cahokia Site. *Illinois Archaeology* 7(1-2):1-68.

Includes a discussion of the production of shell beads.

**Howard, Jennifer M.**

2008 No Drills, No Problem? The Possible Use of Sea Urchin Spines as Drills on San Nicolas Island: An Experimental Archaeology Project. M.A. thesis. Department of Anthropology, Northern Illinois University, Dekalb.

Disproves the theory that worked sea urchin spines found in association with shell-bead detritus at a site in California’s Channel Islands were used to drill *Olivella* shell beads. They may, however, have been used to smooth out the drill perforations after manufacture.

**Koppel, Brent and Katherine Szabó**

2013 Report on an Experimental Shell-Working Workshop. *Malaco+Archaeology Group Newsletter* 22:1-6.

One section reports on *Nassarius pullus* bead production using indirect percussion.

**Kozuch, Laura**

2003 Use of Fire in Shell Bead Manufacture at Cahokia, Illinois. In *Zooarcheology: Papers to Honor Elizabeth S. Wing*, edited by F. Wayne King and C. Porter, pp. 81-90. *Bulletin of the Florida Museum of Natural History* 44(1).

Presents evidence for heat-treatment of marine shell in bead manufacture at this Mississippian culture site. A columella bead-working reduction sequence is presented.

2007 Replication of *Busycon* Columella Shell Beads. *Illinois Archaeology* 14/15:142-157.

Concentrates on the technology used to produce shell beads found on Mississippian sites in the eastern United States.

2014 Crafting Shell Beads at East St. Louis & Greater Cahokia. Illinois State Archaeological Survey, <https://www.academia.edu/22602830/>, accessed 14 March 2016.

Slide show on the production of disc and columella beads from lightning whelk shells.

**Laporte, Luc**

1994 Parures et centres de production dans le Centre-Ouest de la France au Néolithique final. Ph.D. dissertation. 2 vols. Histoire de l'Art et Archéologie, Université de Paris I-Panthéon/Sorbonne, Paris.

Presents a technological study of Late Neolithic shell-bead production along the west coast of France.

1997 Un site de production de parures discoïdes en coquillageau Néolithique final à Ponthézières (Saint-Georges-d'Oléron, Charente-Maritime). <https://www.academia.edu/2457834/>, accessed 1 August 2016.

Discusses Late Neolithic production of disc shell beads in western France.

1998 Ornament Production Centres along the French Atlantic Coast during the Late Neolithic. In *Craft Specialization: Operational Sequences and Beyond*, edited by Sarah Milliken and Massimo Vidale, pp.17-23. BAR International Series 720.

A condensed version of Laporte (1994).

**Lindner, Christopher and Lisa Folb**

1996 *Chert Microdrills from Eastern New York: Use-Wear on Bushkill Tools that Might Have Made Middlesex Beads*. Occasional Publications in Northeastern Anthropology 15.

Replicative experiments focussing on chert microdrills from a Schoharie Creek site argue against a proposed function of drilling holes in shell beads.

**Littman, S.L. and W.F. Keegan**

1991 A Shell Bead Manufacturing Center on Grand Turk, TCI. In *Proceedings of the Fourteenth International Congress for Caribbean Archaeology, Barbados, 22-28 July, 1991*, edited by A. Cummins and P. King, pp. 147-156. Barbados Museum and Historical Society, Bridgetown.

**Mărgărit, Monica**

2008 Les perles en valves de *Unio* dans l'habitat énéolithique de Hârșova-tell (département de Constanța). *Annales d'Université "Valahia" Târgoviște, Section d'Archéologie et d'Histoire* X(1):73-77.

The settlement of Hârșova-tell, Romania, has produced material representing all the stages in the manufacture of disk beads from *Unio* shells. It is attributed to the Gumelnița culture.

**Mayo Torné, Julia del Carmen**

2004 *La Industria Prehispánica de Conchas Marinas en "Gran Coclé," Panamá*. Ph.D. dissertation. Universidad Complutense de Madrid.

Discusses the prehispanic manufacture of beads and other ornaments from marine shells in Panama.

**Melgar Tísoc, Emiliano Ricardo**

2009 La producción especializada de objetos de concha en Xochicalco. M.A. thesis. Antropología, Universidad Nacional Autónoma de México, México D.F.

In depth study of the specialized manufacture of the shell objects, including beads and pendants, found at a site in central Mexico. Includes experimental technology replication.

2010 Manufacturing Techniques of *Oliva* Pendants at Xochicalco (Morelos, México). In *Not only Food: Marine, Terrestrial and Freshwater Molluscs in Archaeological Sites*, edited by E. Álvarez-Fernández and D.R. Carvajal-Contreras, pp. 216-225. Munibe Suplemento 31.

Identifies the different tools and techniques employed in the production of *Oliva* shell pendants, also known as tinklers, at the Epiclassic (AD 650-900) site of Xochicalco, in the Western Valley of Morelos, México. These pendants once formed necklaces and were part of offerings inside the main structures of the settlement.

2011 Evidencias de producción de objetos de concha en Xochicalco. *Estudios del hombre* 29:153-176. Presents evidence for the manufacture of shell beads and pendants at Xochicalco, a walled site in Mexico inhabited ca. AD 650-900.

**Melgar Tísoc, Emiliano Ricardo and María del Rosario Domínguez Carrasco**

2014 Los artesanos de concha y la élite de Calakmul: los objetos elaborados y sus técnicas de manufactura. *Los Investigadores de la Cultura Maya* 2013 22(2):203-219.

Describes shell beadmaking technology based on specimens excavated at Calakmul, Campeche, Mexico.

**Micheli, Roberto**

2015 Conchiglie affascinanti per ornamenti di prestigio: produzione, distribuzione e impiego dello *Spondylus gaederopus* nella preistoria europea. In *Appunti di archeomalacologia*, edited by A. Girod, pp. 198-212. All'Insegna del Giglio, Sesto Fiorentino.

Investigates the production, distribution, and use of ornaments, including beads, made from the shells of *Spondylus gaederopus* in European prehistory.

**Miller, Michelle A.**

1996 The Manufacture of Cockle Shell Beads at Early Neolithic Franchthi Cave, Greece: A Case of Craft Specialization? *Journal of Mediterranean Archaeology* 9(1):7-37.

Examines the manufacture of one distinct type of disc bead made from marine mollusc shell. The results of this study establish criteria which may be applied to the production of diverse ornaments of various materials and from sites of many regions and dates.

**Moore, Jerry D. and Carolina Vilchez**

2016 Spondylus and the Inka Empire on the Far North Coast of Peru: Recent Excavations at the Taller Conchales, Cabeza de Vaca, Tumbes. In *Making Value, Making Meaning: Techné is the Pre-Columbian World*, edited by Cathy Costin, pp. 221-251. Dumbarton Oaks, Washington.

Presents new archaeological data for the Inka state's organization of *Spondylus* craft production at Taller Conchales which illuminate the different *châines opératoires* involved in producing *Spondylus* objects such as beads and pendants – production that reflects political decisions, ritual practice, and the techné of artisans.

**Murphy, Kirsty**

2011 'She Drills Seashells on the Seashore': An Experimental Study – Manufacture-Wear vs. Use-Wear Using Palaeolithic Technologies for the Perforation of Whole Shell Beads. In *Archaeomalacology Revisited: Non-Dietary Use of Molluscs in Archaeological Settings*, edited by Canan Çakırlar, pp. 54-63. Oxbow Books, Oxford.

Analyzes the relative effectiveness of different manufacturing techniques for whole shell bead perforation, using simple technologies that would have been available at the time.

**Nigra, Benjamin T. and Jeanne E. Arnold**

2013 Explaining the Monopoly in Shell-Bead Production on the Channel Islands: Drilling Experiments with Four Lithic Raw Materials. *Journal of Archaeological Science* 40(10):3647-3659.

Tests the proposition that Channel Island, California, chert outperforms other lithic materials in drilling efficiency and drill use life.

**Pascual Benito, Josep Lluís**

2003 Los talleres de cuentas de *Cardium* del Neolítico peninsular. In *Actas del III Congreso del Neolítico en la Península Ibérica*, edited by Pablo Arias Cabal, Roberto Ontañón Peredo, and Cristina García-Moncó Piñeiro, pp. 277-286. Monografías del Instituto Internacional de Investigaciones Prehistóricas de Cantabria 1.

Discusses the process for producing circular beads from *Cardium* shells at two Early Neolithic sites in Spain.

**Pauc, Paulette**

1997 Reproduction de perles circulaires réalisées en test de *Cerastoderma edule*. In *Journées d'Archéologie Expérimentale. Bilan des années 1996-1997*, edited by Christian Chevillot, pp. 7-66. Parc Archéologique de Beynac, Dordogne, France.

Replicates the technology used to produce circular beads from cockle shells during the Neolithic period.

2000 La production de parures en coquillages marins, dans l'Aude (F.), entre le Néolithique final et le Bronze ancien. In *Pirineus i veïns al 3r mil·lenni AC: XII Col·loqui International d'Arqueologia de Puigcerdà, 10-12 de novembre del 2000*, pp. 367-376. Institut d'Estudis Ceretans, Puigcerdà, Spain.

Fifty sites in the department of Aude in southern France have revealed evidence of marine-shell ornament production, mainly circular beads made from the shells of *Cerastoderma edule*.

2010 Introduction of the Third Experimental Necklace of Prehistoric Jewellery Components. *Malaco+Archaeology Group Newsletter* 17:7-10.

Jewellery components made in imitation of prehistoric examples were strung on a linen cord and worn for a month. The results are compared with prehistoric jewellery showing different types of wear.

**Pauc, P. with D. Bohic and P. Faure**

2004 Brève typologie de l'outillage lithique inhérent à la fabrication de parures protohistoriques en coquillages et les sources de matières. *Bulletin de la Société d'Études Scientifiques de l'Aude* 104:69-76.

Presents a brief description of the stone tools used in the manufacture of Neolithic shell beads and investigates the source of the raw material. France.

**Pauc, P. and A. Pauc**

2006 Enfilage des coquilles de *Columbella rustica* et de *Trivia europea*. *euroREA* 3:25-30.

The authors have been experimenting with the perforation and threading of beach shells in an attempt to reproduce prehistoric shell necklaces such as found in Early Bronze Age contexts in Switzerland.

**Pauc, P. and J. Reinhard**

2002 Protohistoric Shell Bead Manufacture and the Problem of String Suspension: Recent Studies in the Northwestern Mediterranean Region. *Malaco+Archaeology Group Newsletter* 2:2-5.

**Pearson, Charles E. and Fred C. Cook**

2012 The Bead Maker's Midden: Evidence of Late Prehistoric Shell Bead Production on Ossabaw Island, Georgia. *Southeastern Archaeology* 31(1):87.

Excavation revealed abundant information regarding shell-working technology, including the full range of tools and raw materials used and the sequences involved in the production of shell beads. Replication experiments were conducted to validate the archaeological findings.

**Perlès, Catherine**

2018 *Ornaments and Other Ambiguous Artifacts from Franchthi: Volume 1, The Palaeolithic and the Mesolithic*. Indiana University Press, Bloomington.

The majority of ornaments recovered from Franchthi Cave in Greece were formed from shell and constitute one of the largest collections in Europe for the temporal periods involved. Analysis of the ornaments has revealed the complete production process.

**Perlès, Catherine and Marian Vanhaeren**

2010 Black *Cyclope neritea* Marine Shell Ornaments in the Upper Palaeolithic and Mesolithic of Franchthi Cave, Greece: Arguments for Intentional Heat Treatment. *Journal of Field Archaeology* 35(3):298-309.

A reassessment of the ornaments from the site led to the hypothesis that a variable fraction of at least one type of personal ornament (marine-shell beads belonging to the species *Cyclope neritea*) may have been intentionally heated to change their natural whitish color to black.

**Perrette, Claire**

2011 Value and Shell Artefacts in Melanesia: Analysis of the Assemblage of Bourewa (Viti Levu, Fiji). M.A. thesis. Université de Bourgogne.

This study of 324 shell ornaments (including beads and pendants) associated with the Lapita culture focuses on four major facets of shell artifact production and consumption: (1) raw material choice, (2) shellworking techniques, (3) curation, and (4) implications for value.

**Rick, Torben C.**

2004 Red Abalone Bead Production and Exchange on California's Northern Channel Islands. *North American Archaeologist* 25:215-237.

California's Channel Islands were ancient centers of shell bead production and exchange. Research at two historic Chumash villages on the Santa Rosa and San Miguel islands produced large assemblages of red abalone epidermis beads, beads-in-production, and bead blanks. A dearth of finished beads compared to beads-in-production suggests that most of the beads were being manufactured for trade or use outside of the household in which they were produced.

**Ricou, Christian and Thimus Esnard**

2000 Étude expérimentale concernant la fabrication de perles en coquillage de deux sites artenaciens oléronais. *Bulletin de la Société préhistorique française* 97(1):83-93.

Sites devoted to the manufacture of shell beads from cockle shells on the island of Oléron, France, have yielded evidence for all the production steps.

**Ricou, Christian, Thimus Esnard, and Luc Laporte**

2009 Archéologie expérimentale: Éléments de comparaison ethnographiques et archéologiques / Experimental archeology: Elements for Comparing Ethnographic and Archaeological Data. In *Des premiers paysans aux premiers métallurgistes sur la façade atlantique de la France (3500-2000 av. J.-C.) / From the First Farmers to the First Metallurgists on the French Atlantic Coast (3500-2000 cal. B.C.)*, edited by Luc Laporte, pp. 506-520. Édition Association des Publications Chauvinoises, Mémoire XXXIII.

Reports on the experimental replication of stone and shell beads found on Artenacian sites in west-central France.

**Rigaud, Solange and I. Gutiérrez-Zugastie**

2015 Symbolism among the Last Hunter-Fisher-Gatherers in Northern Iberia: Personal Ornaments from El Mazo and El Toral III Mesolithic Shell Midden Sites. *Quaternary International*, doi:10.1016/j.quaint.2015.10.029, accessed 17 May 2016.

*L. obtusata* and *Trivia* sp. shells were systematically used for personal ornamentation by groups who occupied northern Iberia during the Mesolithic. The shells from two sites in Asturias, Spain, offer a unique opportunity for investigating raw material procurement, selection strategies, and manufacturing processes developed by Asturian Mesolithic societies for bead production.

**Salas Rossenbach, Kai**

2007 Estudio Tecnológico de 13 collares etnográficos patagónicos / Technological Study of 13 Ethnographic Necklaces from Patagonia. *Magallania* 35(1):33-41.

Describes the techniques used to produce the shell bead that comprise the long necklaces worn by the Patagonian Canoe Indians of Chile.

**Serrand, Nathalie**

1995 Strombus Gigas: Parts and their Utilization for Artefacts Manufacture: A Case Study from the Tanki Flip Site, Aruba. *Proceedings of the International Association for Caribbean Archaeology* 16:229-240.

Concentrates on beads and pendants specifically made from *Strombus gigas* shells and presents the complete manufacturing sequence. The material dates to ca. AD 1000-1500.

**Shaw, Ben and Michelle C. Langley**

2017 Investigating the Development of Prehistoric Cultural Practices in the Massim Region of Eastern Papua New Guinea: Insights from the Manufacture and Use of Shell Objects in the Louisiade Archipelago. *Journal of Anthropological Archaeology* 48:149-165.

Shell beads and other objects from five prehistoric sites on two islands (Rossel and Nimowa) in the Louisiade Archipelago are analyzed to determine how they were manufactured and used.

**Solís del Vecchio, Felipe and Anayensy Herrera Villalobos**

2015 Herramientas y adornos de concha en el sitio Jícaro: Un acercamiento a las cadenas operativas, Bahía de Culebra, noroeste de Costa Rica. *Vínculos* 35(2012):67-106.

Analysis of the shell beads and pendants recovered from a site occupied during the 10th-15th centuries in northwestern Costa Rica has permitted the reconstruction of the *chaîne opératoire* for the different forms.

**Stiner, Mary C., Steven L. Kuhn, and Erksin Güleç**

2013 Early Upper Paleolithic Shell Beads at Üçağızlı Cave I (Turkey): Technology and the Socioeconomic Context of Ornament Life-Histories. *Journal of Human Evolution* (2013):1-19.

Ten early Upper Paleolithic layers in Üçağızlı Cave I (41-29 uncalibrated ky BP) on the Hatay coast of southern Turkey preserve a rich and varied record of early upper Paleolithic life, including the production and use of large numbers of shell ornaments. This study examines shell bead production, use, and discard in relation to site function and the diversity of on-site human activities.

**Szabó, Katherine**

2004 Technique and Practice: Shell Working in the Western Pacific and Island Southeast Asia. Ph.D. thesis. Department of Archaeology and Natural History, Australian National University, Canberra.

Presents a detailed account of shell artifact production at various sites attributed primarily to the Lapita culture. The findings suggest widespread relationships in shell-working practices across the study area that have a considerable time depth. Beads appear to have been made principally from *Conus* shells.

**Taborin, Yvette**

1991 La parure des Solutréens et des Magdaléniens anciens des Jamblancs. *Paléo* 3(3):101-108.

Discusses the technology for making shell beads and tooth pendants found in the late Solutrean/early Magdalenian levels at Jamblancs, France.

**Tátá, Frederico, João Cascalheira, João Marreiros, Telmo Pereira, and Nuno Bicho**

2014 Shell Bead Production in the Upper Paleolithic of Vale Boi (SW Portugal): An Experimental Perspective. *Journal of Archaeological Science* 42:29-41.

Focuses on shell bead production during the Upper Paleolithic at the site of Vale Boi in southwestern Portugal as a means of understanding social visual transmission. Experimental replication techniques



include scratching, sawing, and hammering using lithic and bone implements on both internal and external sides of the shells.

**Tsuneki, Akira**

1989 The Manufacture of *Spondylus* Shell Objects at Neolithic Dimini, Greece. *Orient* XXV:1-21. Beads are among the objects discussed.

**Velázquez Castro, Adrián**

2007 *La producción especializada de los objetos de concha del Templo mayor de Tenochtitlan*. Instituto Nacional de Antropología e Historia, México.

Discusses the specialized production of shell beads and other objects at the Great Temple of Tenochtitlan, Mexico City.

2012 The Study of Shell Object Manufacturing Techniques from the Perspective of Experimental Archaeology and Work Traces. In *Archaeology, New Approaches in Theory and Techniques*, edited by Imma Ollich-Castanyer, pp. 229-250. InTech.

The techniques employed to manufacture mollusc shell objects in pre-Hispanic Mexico have been little studied to date. Researchers have, therefore, turned to experimental archaeology and the characterization and comparison of manufacturing traces. This article presents the principal results obtained concerning shell pieces found in offerings in the sacred precinct of Tenochtitlan, Mexico City.

**Velázquez-Castro, Adrián, Patricia Ochoa-Castillo, Norma Valentín-Maldonado, and Belem Zúñiga-Arellano**

2017 A Mother-of-Pearl Shell Pendant from Nexpa, Morelos. In *Not Just for Show: The Archaeology of Beads, Beadwork and Personal Ornaments*, edited by Daniella E. Bar-Yosef Mayer, Clive Bonsall, and Alice M. Choyke, pp. 129-135. Oxbow Books, Oxford and Philadelphia.

Presents the analysis of a shell pendant depicting two lizards excavated in southern Mexico that dates to the Early Formative period. Includes information regarding manufacturing techniques.

**Vitezović, Selena**

2011 Neolithic Decorative Objects from Osseous Materials from the Site Starčevo-Grad. *Zbornik Narodnog muzeja* XX(1):11-25.

Examines 20 objects of bone and shell (including beads and pendants) from the Starčevo culture in Serbia from a technological point of view: raw materials, production techniques, form, use, and discard.

**Yerkes, Richard W.**

1993 Methods of Manufacturing Shell Beads at Prehistoric Mississippian Sites in Southeastern North America. In *Traces et fonction, les gestes retrouvés: Actes du colloque international de Liège 8, 9, 10 décembre 1990*, Vol. 1, edited by Patricia C. Anderson, pp. 235-242. *Études et Recherches Archéologiques de l'Université de Liège* 50.

The processes that prehistoric Mississippian artisans developed to manufacture shell beads have been reconstructed through experimental replication studies, microwear analysis, and ethnographic observations. A survey of ethnographic data on shell-working in southeastern North America is presented, and the results of the replication experiments and microwear analyses are summarized.

## EGGSHELL

### **Barich, Barbara E. and Giulio Lucarini**

2014 The Hidden Valley Technological Complex – An Overview. In *From Lake to Sand: The Archaeology of Farafra Oasis, Western Desert, Egypt*, edited by Barbara E. Barich, Giulio Lucarini, Mohamed A. Hamdan, and Fekri A. Hassan, pp. 321-332. Edizioni All’Insegna del Giglio, Florence.

Discusses ostrich eggshell bead production at a mid-Holocene site in Egypt.

### **Bednarik, Robert G.**

1998 The Archaeological Significance of Beads and Pendants. *Man and Environment* 23(2):87-99. Discusses the subject from the perspective of cognitive human evolution. Posits the presence of beads from the Acheulian period onwards, and presents the results of replicating the manufacture of ostrich-eggshell beads.

2011 About Ostrich Eggshell Beads. *The Bead Forum* 59:2-8.

On early disc beads and the replication of their manufacturing techniques.

2015 The Significance of the Earliest Beads. *Advances in Anthropology* 5:51-66.

This paper attempts to explore beyond the predictable and banal archaeological explanations relating to early beads and pendants. It recounts replication experiments to establish aspects of technology so as to better understand what can be learned from the quantifiable properties of these artifacts.

### **Beyin, Amanuel**

2010 Use-Wear Analysis of Obsidian Artifacts from Later Stone Age Shell Midden Sites on the Red Sea Coast of Eritrea, with Experimental Results. *Journal of Archaeological Science* 37(7):1543-1556.

The sites produced large quantities of lithic artifacts in association with mollusc shells and ostrich eggshell beads, but it is unclear if all the stone tools were required for bead and mollusk shell processing. The study involved recording of microfracture damage traces in order to infer the use-material and the manner in which the artifacts were used.

### **Cristiani, Emanuela**

2014 Ostrich Eggshell Products from Hidden Valley Village, Farafra Oasis – Contributions from Technological Analysis. In *From Lake to Sand: The Archaeology of Farafra Oasis, Western Desert, Egypt*, edited by Barbara E. Barich, Giulio Lucarini, Mohamed A. Hamdan, and Fekri A. Hassan, pp. 301-306. Edizioni All’Insegna del Giglio, Florence.

Analysis permitted the reconstruction of the *chaîne opératoire* of the ostrich eggshell beads from a mid-Holocene site thanks to the large number of unfinished fragments.

### **Flexner, J.L., J.B. Fleisher, and A. LaViolette**

2008 Bead Grinders and Early Swahili Household Economy: Analysis of an Assemblage from Tumbwe, Pemba Island, Tanzania, 7th-10th Centuries AD. *Journal of African Archaeology* 6(2):161-181.

Discarded potsherds or stone cobbles with long grooves abraded into their surfaces are some of the most common artifacts on late 1st-millennium AD coastal sites and are believed to have been utilized to form

shell beads. Examination of a large assemblage of grinders from Tumbe suggests that production was unstandardized and decentralized, carried on in individual households.

**Jacquet, Agathe**

2014 *Expérimentation archéologique: La chaîne opératoire de fabrication des perles discoïdes en test d'oeuf d'autruche au Néolithique dans le Bassin du Gobaad, République de Djibouti*. Espace de Recherches Expérimentales de Cambous (EREC), Société Languedocienne de Préhistoire (SLP), Cahier 1.

Replicates the likely method used to produce Neolithic ostrich-eggshell beads in the Gobaad Basin, Republic of Djibouti, Africa.

**Kandel, Andrew W. and Nicholas J. Conard**

2005 Production Sequences of Ostrich Eggshell Beads and Settlement Dynamics in the Geelbek Dunes of the Western Cape, South Africa. *Journal of Archaeological Science* 32(12):1711-1721.

Focuses on the production, use, and discard of ostrich eggshell beads recovered from Later Stone Age open-air sites in the Geelbek Dunes of the Western Cape, and presents a comprehensive production chain for analyzing the manufacture of beads and introduces the concept of a heuristic production value for evaluating the degree of completion reflected by an assemblage.

**Mandu, V.**

995 The Technology of Ostrich Eggshell Bead Production. B.A. dissertation. University of Nairobi.

**Orton, Jayson**

2008 Later Stone Age Ostrich Eggshell Bead Manufacture in the Northern Cape, South Africa. *Journal of Archaeological Science* 35(7):1765-1775.

The data from five beadmaking sites of the Later Stone Age in Namaqualand show that most breakage occurs during the drilling stage and that the production process has not changed through the last 4,000 years. The lack of production debris reflecting large beads suggests these were brought into Namaqualand from elsewhere.

**Pleurdeau, David, Emma Imalwa, Florent Détroit, Joséphine Lesur, Anzel Veldman, Jean-Jacques Bahain, and Eugène Marais**

2012 "Of Sheep and Men": Earliest Direct Evidence of Caprine Domestication in Southern Africa at Leopard Cave (Erongo, Namibia). *PLoS One* 7(7): e40340.

The recovered ostrich eggshell beads and pendants were produced using three different manufacturing techniques.

**Sůvová, Zdeňka, Lenka Suková, Ladislav Varadzin, Martin Odler, Václav Čílek, and Petr Pokorný**

2014 The Production and Consumption of Ostrich Eggshell Beads at the Mesolithic Settlement of Sphinx (SBK.W-60), Jebel Sabaloka. <https://www.academia.edu/8615520/>, accessed 10 June 2017.

Poster presentation on material from a site in Sudan.

**Wang, ChunXue, Yue Zhang, Xing Gao, XiaoLing Zhang, and HuiMin Wang**

2009 Archaeological Study of Ostrich Eggshell Beads Collected from SDG Site. *Chinese Science Bulletin* 54(21):3887-3895, doi: 10.1007/s11434-009-0620-6.

Discusses the production techniques for the eggshell beads found at the Shuidonggou (SDG) site, Ningxia Province, China, and dated to the Early Holocene (< 10 ka BP).

**Wingfield, C.**

2003 Ostrich Eggshell Beads and the Environment, Past and Present. In *Researching Africa's Past: New Contributions from British Archaeologists*, edited by P. Mitchell, A. Haour, and J. Hobart, pp. 54-60. Oxford School of Archaeology.

An in-depth study of the making of ostrich eggshell beads and what can be learned from applying present-day technology to interpreting the past.

**BONE, IVORY, ANTLER, AND HORN**

**Brumm, Adam, Michelle C. Langley, Mark W. Moore, Budianto Hakim, Muhammad Ramli, Iwan Sumantri, Basran Burhan, Andi Muhammad Saiful, Linda Siagian, Suryatman, Ratno Sardi, Andi Jusdi, Abdullah, Andi Pampang Mubarak, Hasliana, Hasrianti, Adhi Agus Oktaviana, Shinatria Adhityatama, Gerrit D. van den Bergh, Maxime Aubert, Jian-xin Zhao, Jillian Huntley, Bo Li, Richard G. Roberts, E. Wahyu Saptomo, Yinika Perston, and Rainer Grün**

2017 Early Human Symbolic Behavior in the Late Pleistocene of Wallacea. *PNAS*; DOI: 10.1073/pnas.1619013114, accessed 11 April 2017.

Late Pleistocene finds at the Leang Bulu Bettue rock-shelter on Sulawesi, Indonesia, include two bead blanks fashioned from the same lower incisor of a pig-deer and a pendant consisting of a bear cuscus phalange with a perforation at its proximal end. Includes information regarding production techniques.

**Camps-Fabrer, Henriette (ed.)**

1991 *Fiches typologiques de l'industrie osseuse préhistorique, cahier IV: objets de parure*. Publications de l'Université de Provence, Aix-en-Provence.

A typology for prehistoric bone, shell, and ivory ornaments, including beads, spacers, and pendants. Information concerning production techniques, use/wear, and spacial and temporal distribution is also provided.

**Lázníčková-Galetová, Martina**

2014 The Phenomenon of Gravettian Necklaces – Mammoth Ivory Necklaces from Dolní Věstonice I (Moravia, Czech Republic). *Quaternary International* 359-360:229-239.

Seven beads/pendants were examined to determine the state of conservation, manufacturing technology, decorating style, and supposed function. It was possible to partially reconstruction of the *chaîne opératoire*.

**Le Dosseur, Gaëlle**

2004 Fiche travail de l'os au Proche-Orient durant l'Épipaléolithique récent (Natoufien). In *Fiches de la Commission de nomenclature sur l'industrie de l'os préhistorique. Cahier XI: Matières et techniques*, edited by Denis Ramseyer, pp. 89-112. Éditions Société Préhistorique Française, Paris.

Contains short sections on the manufacture of tubular and globular beads from the bones of birds and mammals, as well as pendants made from mammal canines, in the Middle East during the recent Epipaleolithic (Natoufien).

**Lubinski, Patrick M.**

2003 Rabbit Hunting and Bone Bead Production at a Late Prehistoric Camp in the Wyoming Basin. *North American Archaeologist* 24(3):197-214.

Illustrates and discusses evidence for rabbit-bone bead production at the Raptor site in southwestern Wyoming. The site dates to approximately AD 600-1000.

**MacGregor, Arthur**

1985 *Bone, Antler, Ivory, and Horn: The Technology of Skeletal Materials Since the Roman Period*. Barnes and Noble, Totowa, NJ.

Beads, mostly medieval (pp. 99-102, fig. 58).

**Mărgărit, Monica, Valentin Radu, and Dragomir Nicolae Popovici**

2015 From Operculum to Bead: Production of Pearls from Opercular Bones of *Cyprinus carpio* in the Romanian Eneolithic. *Environmental Archaeology*, DOI:

<http://dx.doi.org/10.1179/1749631414Y.0000000019>, accessed 20 July 2015.

Sites of the Gumelnița culture in Romania have produced a significant number of carp opercular bones in the process of being turned into circular beads.

**Moreno-García, Marta, Carlos M. Pimenta, Ana Pajuelo Pando, and Pedro M. López Aldana**

2010 Archaeological Evidence of Pre-Industrial Worked Bone Activity in 18th Century Seville, Spain. In *Ancient and Modern Bone Artefacts from America to Russia*, edited by Alexandra Legrand-Pineau et al., pp. 183-190. BAR International Series 2136.

On the manufacture of lathe-turned bone rosary beads.

**Picod, C.E.A.**

1999 Examen de perles en os tourné des XVIème et XVIIème siècles et expérimentation. In *La tournerie: mémoire et créations*, pp. 31-37. Centre Jurassien du Patrimoine, Lons-le-Saunier, Lavans.

An examination of lathe-turned bone beads of the 16th and 17th centuries with replication experimentation.

**San Juan-Foucher, Cristina, Pascal Foucher, and Carole Vercoutère**

2013 Parures aurignaciennes de Gargas (Hautes-Pyrénées, France): approche typo-technologique d'un nouveau type de perle. In *F. Javier Fortea Pérez. Universitatis Ovetensis Magister: estudios en homenaje*, edited by Marco de la Rasilla Vives, pp. 335-346. Ediciones de la Universidad de Oviedo.

Presents a detailed typo-technological and comparative study of two previously unrecorded items of personal adornment from the Aurignacian deposits at Gargas, France. One is a finished antler bead and the other an ivory bead blank.

**Smith, Marc B. and John W. Fisher, Jr.**

2010 Bone Beads and Bead Production Debitage. In *Precontact Archaeology and Prehistory of the Central Montana High Plains*, edited by Leslie B. Davis, p. 130. Bureau of Land Management Cultural Resources Series 5. Billings, Montana.

**Spitzers, T.A.**

2009 Die Konstanzer Paternosterleisten: Analyse zur Technik und Wirtschaft im spätmittelalterlichen Handwerk der Knochenperlenbohrer. Ph.D. dissertation. University of Amsterdam.

Presents an analysis of bone beadmaking technology and economy during the late medieval period in Constance, Germany.

2013 Die Konstanzer Paternosterleisten: Analyse zur Technik und Wirtschaft im spätmittelalterlichen Handwerk der Knochenperlenbohrer. *Fundberichte aus Baden-Württemberg* 33:661-940.

As above.

**Vitezović, Selena**

2011 Neolithic Decorative Objects from Osseous Materials from the Site Starčevo-Grad. *Zbornik Narodnog muzeja* XX(1):11-25.

Examines 20 objects of bone and shell (including beads and pendants) from the Starčevo culture in Serbia from a technological point of view: raw materials, production techniques, form, use, and discard.

**Walter, Rudolf**

2018 Essai d'archéologie expérimentale pour la production de perles à perforation double aurignaciennes / Test in Experimental Archaeology in Order to Produce Aurignacian Double Perforated Beads. *L'Anthropologie* 122(3):374-384.

Reports on attempts to replicate small double-perforated ivory beads which are an important category of finds in southwestern Germany during the Aurignacian.

**White, Randall**

1989 Production Complexity and Standardisation in Early Aurignacian Bead and Pendant Manufacture: Evolutionary Implications. In *The Human Revolution: Behavioural and Biological Perspectives on the Origins of Modern Humans*, edited by Christopher Stinger and Paul Mellars pp. 366-390. Edinburgh University Press.

1989 Visual Thinking in the Ice Age. *Scientific American* 261(1):92-99 (July).

Reconstructs ivory bead production during the Aurignacian period in southwestern France.

1995 Ivory Personal Ornaments of Aurignacian Age: Technological, Social and Symbolic Perspectives. In *Travail et l'usage de l'Ivoire au Paléolithique Supérieur*, edited by J. Hahn et al., pp. 29-62.

Centre Universitaire Européen pour les Biens Culturels, Ravello, Italy.

Reports on several years of research on Aurignacian personal ornaments, a large proportion of which were manufactured of mammoth ivory. The technology of ivory bead production is shown to have been extraordinarily labor consumptive and to have varied from one European region to the next. France, Germany, Belgium, European Russia.

2002 Observations technologiques sur les objets de parure. In *L'Aurignacien de la grotte de Renne: Les fouilles d'André Leroi-Gourhan à Arcy-sur-Cure (Yonne)*, edited by B. Schmider, pp. 257-266. Supplément à Gallia Préhistoire XXXIV.

Discusses the technology of Aurignacian beads and pendants of ivory and animal canines, respectively. Also a perforated gastropod shell. France.

2004 La parure en ivoire des hommes de Cro-Magnon. *Pour la Science* 43:98-103 (April-June).  
Observation, analysis, and experimentation reveal the techniques used by Aurignacian artisans to produce “basket” beads of mammoth ivory.

## SEEDS AND NUTS

**Pauc, P., P. Moinat, and J. Reinard**

2005 Description de la fabrication expérimentale du grain d’enfilage en akène de *Lithospermum* de type 2 et de la pendeloque à ailettes globulaires. *euroREA* 2:40-54.

Replicates the production of two types of prehistoric beads made from seeds in Europe.

## MIXED MATERIALS

**Acosta, Alejandro A., Natacha Buc, and M. Natalia Davrieux**

2015 Producción y uso de ornamentos en las tierras bajas de Sudamérica: el caso de las poblaciones humanas prehispanicas del extremo meridional de la cuenca del Plata (Argentina) / The Production and Use of Ornaments in the Lowlands of South America: The Case of Pre-Hispanic Human Populations of the Southern End of the La Plata Basin (Argentina). *Munibe Antropologia-Arkeologia* 66:09-325.

The beads and pendants of shell, stone, ceramic, and perforated carnivore canines recovered from several sites are described, focusing on the raw materials used, their acquisition, and other aspects linked to the manufacturing processes. Their possible use as vectors of information transmission is also discussed.

**Bains, Roseleen, Milena Vasić, Daniella E. Bar-Yosef Mayer, Nerissa Russell, Katherine I. Wright, and Chris Doherty**

2013 A Technological Approach to the Study of Personal Ornamentation and Social Expression at Çatalhöyük. In *Substantive Technologies from Çatalhöyük: Reports from the 2000-2008 Seasons*, edited by I. Hodder, pp. 331-363. Monographs of the Cotsen Institute of Archaeology, University of California at Los Angeles.

Delves in detail into the technologies and methods used to manufacture beads of stone, clay, shell, and bone and teeth at a large Neolithic settlement in southern Anatolia, Turkey.

**Breukel, T.W. and C.G. Falci**

2017 Experimental Reproduction of Wear Traces on Shell, Coral, and Lithic Materials from the pre-Colonial Caribbean. In *Proceedings of the 26th Congress of the International Association for Caribbean Archaeology*, edited by C.B. Velasquez and J.B. Haviser. SIMARC Heritage Series 15.

Reports on the experimental replication of techniques used for splitting, abrading, carving, and perforating a variety of shell species and rock types using tools made of flint, bone, coral, coarse and fine-grained sandstone, and shell.

**Evely, D.**

1992 Stone Vases and Other Objects. In *Well Built Mycenae, fasc. 27: Ground Stone*, edited by W.D. Taylour, E.B. French, and K.A. Wardle, pp.1-34. Oxbow, Oxford.

Describes a stone mold for making gold and vitreous relief-beads (pp. 29-31).

**Falci, Catarina Guzzo**

2017 Assembling all the Beads: The Production and Use of Late Ceramic Age Beads from Northwestern Dominican Republic. In *Proceedings of the 26th Congress of the International Association for Caribbean Archaeology*, edited by C.B. Velasquez and J.B. Haviser. SIMARC Heritage Series 15.

Assesses how beads were produced and used by the indigenous peoples of the Caribbean based primarily on finds from the site of El Flaco which dates to the 13th-15th centuries. Included are beads made of igneous rocks, calcite, coral, and shell.

**Formigli, Edilberto**

1995 *Preziosi in oro, avorio, osso e corno: arte e tecniche degli artigiani etruschi*. Atti del seminario di studi ed esperimenti: Murlo, 26 settembre - 3 ottobre 1992. Nuova Immagine, Siena.

A detailed and amply illustrated study of Etruscan manufacturing methods including gold, ivory, bone, and stone. Much on granulation.

**Gurova, Maria and Clive Bonsall**

2017 Experimental Replication of Stone, Bone and Shell Beads from Early Neolithic Sites in Southeast Europe. In *Not Just for Show: The Archaeology of Beads, Beadwork and Personal Ornaments*, edited by Daniella E. Bar-Yosef Mayer, Clive Bonsall, and Alice M. Choyke, pp. 159-167. Oxbow Books, Oxford and Philadelphia.

**Hutchinson, M.E.**

1996 *A Technical Examination of the Non-Glass Beads from Two Anglo-Saxon Cemeteries at Mucking, Essex*. Ancient Monuments Laboratory Report 52/95.

Examines the holes, surfaces, etc., of 557 amber, jet/shale, silver, and quartz beads. A diskette accompanying the report contains two databases describing each bead.

**Kenoyer, J. Mark**

1986 The Indus Bead Industry: Contributions to Bead Technology. *Ornament* 10(1):18-23. Covers shell, stone, bleached ("etched") carnelian, paste, and faience.

**Miller, Heather M.-L.**

2007 *Archaeological Approaches to Technology*. Academic Press, Burlington, MA.

Discusses the technological aspects of the production of beads of stone, shell, faience, and glass, as well as the archaeological determination of the relative value of objects for prehistoric societies, and the relationship between valued objects and status.

**Pau, Claudia**

2015 Los objetos de adorno personales campaniformes de los yacimientos granadinos: El caso de Cerro de la Virgen, Orce, Granada. *Revista Atlantica-Mediterranea* 17:63-271.

Reports on the beads and pendants of bone, shell, and animal teeth from a Bell Beaker site in southeastern Spain, including insight into usage and production technology.

**Pauc, Paulette, Patrick Moinat, and Jacques Reinhard**

2004 Le collier de la dame de Chamblandes. *euroREA* 1:103-118.



Discusses the replication of a necklace found with a female burial in Switzerland and attributed to the 4th millennium BC. Materials included marble, brown coal, shell, and seeds.

**Reese, David S.**

1999 The Pierced Calcarenite Disk. In *Faunal Extinction in an Island Society: Pygmy Hippopotamus Hunters of Cyprus*, by A.H. Simmons, p. 151f. Kluwer Academic/Plenum, New York.

Describes a neolithic stone disc, 105 mm in diameter, 7 mm thick, with a beveled 4.75-mm central perforation. Various uses have been suggested for such discs but the author suggests they were platforms for stone and shell beadmaking, the central hole serving to hold the piece being worked.

**White, Randall and Christian Normand**

2015 Early and Archaic Aurignacian Personal Ornaments from Isturitz Cave: Technological and Regional Perspectives. In *Aurignacian Genius: Art, Technology and Society of the First Modern Humans in Europe, Proceedings of the International Symposium, April 08-10 2013, New York University*, edited by in Randall White and Raphaëlle Bourrillon, pp. 138-164. P@lethnology 7.

Focuses on the techniques used for perforating teeth; the chronological variation in the selection of animal teeth (and one human tooth); the raw materials used for the beads and pendants (amber, ivory, talc, bone); data concerning local personal ornament production (or not); the exploitation of amber and its provenance; and the existence of abundant personal ornaments (pendant-anthropomorphic sculpture and shells) in the Archaic Aurignacian levels.

**Wright, Katherine I. (Karen)**

2012 Beads and the Body: Ornament Technologies of the BACH Area Buildings at Çatalhöyük. In *House Lives: Building, Inhabiting, Excavating a House at Çatalhöyük, Turkey*, edited by R. Tringham and M. Stevanovic, pp. 17.1-17.44. University of California at Los Angeles, Monographs of the Cotsen Institute of Archaeology.

Presents a thorough discussion of the stone, shell, bone, and clay beads from a very large Neolithic and Chalcolithic settlement in southern Anatolia, Turkey.

**Wright, K.I., P. Critchley, A.N. Garrard, R. Bains, D. Baird, and S. Groom**

2008 Stone Bead Technologies and Early Craft Specialization: Insights from Two Neolithic Sites in Eastern Jordan. *Levant* 40(2):131-165.

Stone bead production and exchange in Wadi Jilat and the Azraq Basin, Jordan.