

rendered Meighan's interpretations of certain topics—such as his discussion of the origins of the various beads brought to the region—outdated and factually incorrect.

But this project goes much further than simply publishing Meighan's system and accompanying text. As the editor, Blair makes use of extensive footnoting to point out where current understandings conflict with Meighan's original text, providing a range of references to more recent archaeological studies from both academia and cultural resource management. While Blair relies on footnotes for most of his edits, he does offer a substantive introductory chapter that situates Meighan's work both historically and in the context of contemporary bead research. For the uninitiated, this chapter alone offers a useful introduction to California glass bead studies. Particularly useful here is his short discussion of likely manufacturing centers, which included not only Venice, but also France, Bohemia, and perhaps even China.

Blair is also credited as a coauthor on Chapter 6, which presents Meighan's original descriptive typology with key updates including each bead's corresponding placement in the Kidd/Karklins system. Though Blair does not exhaustively expand Meighan's tabulation of the geographic distribution for each bead type, the textual descriptions for many beads contain additional information about manufacturing location and dating, drawn from Blair's extensive research on the glass beads of colonial North America. Especially important in this chapter are two concordance tables. Table 5, for example, organizes Meighan's types by Kidd/Karklins type in a clearly legible manner. The other, Table 6, is presented according to Meighan's type numbers but also includes each bead's corresponding Kidd/Karklins type along with information on manufacturing method, construction, color, opacity, and size. Taken together, these tables are nothing short of a Rosetta Stone for the early historical archaeology of California.

It is also worth reiterating that nearly all of the beads in the type collection were collected from Native Californian ancestral sites. Perhaps ironically given Meighan's vocal opposition to repatriation, the published volume is sensitive to this fact and to the contemporary cultural and political contexts in which these beads exist. As Blair explains in his introduction, many of the beads in Meighan's type collection lack robust provenience information, and given the history of California archaeology it is likely that at least some were originally associated with burials. Accordingly, Blair consulted with representatives of multiple Native Californian communities, who asked that photographs of

the physical beads not be included. Instead, the volume contains color plates with composite drawings of all 440 of Meighan's original bead types, showing each one along both axes. These drawings are a necessary compromise and the utility of the illustrations is not diminished in any meaningful way—especially given the long reliance of bead researchers on the drawings presented in the Kidd/Karklins typology.

Overall, the publication of Meighan's *Glass Trade Beads of California* will be immensely satisfying for a subset of archaeologists and other bead researchers who have waited for this volume in some cases for decades. But the final version of the book is more than simply the long-overdue printing of Meighan's original typology. Blair has done a commendable job of maintaining the flavor of the original while simultaneously offering updates that will greatly enhance the impact of this publication. By contextualizing Meighan's original work within the current state of the art of bead studies, Blair has positioned this volume to help breathe life into older collections and to bring broader awareness to the fascinating range of glass beads that circulated across the complex social interactions between Native communities and various newcomers in colonial California.

REFERENCES CITED

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The Elemental Analysis of Glass Beads: Technology, Chronology and Exchange.

Laure Dussubieux and Heather Walder (eds.). Studies in Archaeological Sciences 8. Leuven University Press, Leuven. 2022. 392 pp., 81 figs. ISBN: 9789462703384, 9789461664662, 9789461664655. 80 € (hardback); free (PDF).

Dr. Laure Dussubieux and Dr. Heather Walder have edited a comprehensive and detailed book on the elemental analyses of glass beads. Dr. Dussubieux is a senior research scientist at the Negaunee Integrative Research Center of the Field Museum in Chicago, Illinois. She has considerable experience in the analysis of glass beads from a global perspective, utilizing LA-ICP-MS (Laser Ablation-Inductively Coupled Plasma – Mass Spectrometer). Dr. Heather Walder is an assistant teaching professor in the Department of Archaeology and Anthropology at the University of Wisconsin–La Crosse. Her research interests include the study of colonial and prehistoric material culture, with a particular focus on glass beads.

This publication represents the outcome of a workshop convened at the Elemental Analysis Facility (EAF) of the Field Museum, organized by Dussubieux and Walder. Regrettably, the necessity to comply with the prevailing health protocols necessitated that the event be conducted in an online format. The book brings together more than twenty archaeologists and scientists from various geographical areas to provide insights into the current state of research on the chemical analysis of glass beads. All chemical analyses presented in this book were conducted at the EAF with LA-ICP-MS. Additionally, some chapters include data previously obtained with instrumental neutron activation analysis (INAA), a method that predated analyses with LA-ICP-MS for glass objects. Indeed, prior to the enhancements made to mass spectroscopy instruments and their integration with laser ablation, INAA was the sole non-destructive approach for elemental analysis of glass artifacts.

The book is divided into four sections, in addition to an introduction (two chapters) and a conclusion. The initial two chapters provide an overview of the history of chemical analysis conducted on glass beads (Chapter 1) and of the research questions associated with glass beads worldwide and through time (Chapter 2). Part I is comprised of five chapters on European glass beads found in North America, excavated on sites spanning from the 17th to the 19th century. Part II comprises four chapters on beads manufactured in South and Southeast Asia between the Protohistoric period and the 17th century. The five chapters of Part III are dedicated to the examination of glass beads excavated in Africa and in the western part of the Indian Ocean, with a focus on the precolonial and colonial periods. Finally, Part IV comprises two chapters on glass beads from Israel and Iraq, with a temporal scope spanning

from the Neolithic/Antiquity period to the Medieval period (6000 BCE to 13th century CE).

The book presents a comprehensive and compelling case study in the integration of archaeological and chemical data to address archaeological questions and enhance our understanding of human behavior. Indeed, the examination of manufacturing techniques, trade networks, and questions regarding their chronologies are typically challenging when relying solely on observations, even when utilizing advanced optical and electronic microscopies. The undertaking of a chemical analysis can facilitate the acquisition of such information, provided that the specific data pertinent to the analysis are available. The book's diverse chapters allow readers to explore the different methods to process elemental analysis, including binary and ternary diagrams with relevant chemical elements, as well as multi-component analysis methods such as principal components analysis (PCA). The various contributions, which encompass sites from around the globe, illustrate the diversity of glass bead production and the necessity of considering glass recipes to accurately assign them to the appropriate period and culture. Indeed, several chapters demonstrate the existence of long-distance networks even during the early periods, as well as the striking similarity of the beads manufactured over time and across different geographical regions. The numerous colored plates of beads are of significant value for those engaged in research on beads.

The online supplementary materials are of significant interest to archaeologists seeking to expand their knowledge of the chemical analysis of glass objects with LA-ICP-MS, as well as to more advanced users of chemical analysis data who require comparison materials.

LA-ICP-MS is currently the only non-destructive and micro-invasive elemental method that provides such a wealth of information on glass beads. This book offers a comprehensive overview of the insights that can be gained from such data. Its open access is a valuable contribution to the scientific community and is likely to encourage further exploration of this approach in the study of glass beads.

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