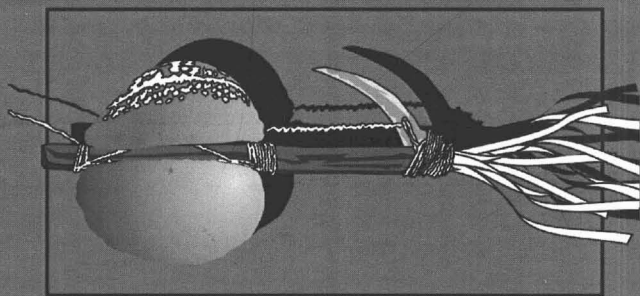


HAWAIIAN ARCHAEOLOGY

VOLUME 10

2005



SOCIETY FOR HAWAIIAN ARCHAEOLOGY

HAWAIIAN ARCHAEOLOGY

VOLUME 10

2005

iii Editor's Preface

THEMATIC ESSAYS

- 1 Determining the Function of Polynesian Volcanic Glass Artifacts: Results of a Residue Study
Marshall I. Weisler and Michael Haslam
- 18 Eight Million Points Per Day: Archaeological Implications of Laser Scanning and Three-Dimensional Modeling of Pu'ukoholā Heiau, Hawai'i Island
Mara A. Mulrooney, Thegn N. Ladefoged, Russell Gibb, and Daniel McCurdy
- 29 Functional Assessment in Archaeological Research
Mike T. Carson

AREA-SPECIFIC REPORTS

- 47 Holocene Landscapes of Waimānalo Bay: Archaeological Investigations at Bellows Beach, O'ahu
John A. Peterson
- 70 Archaeological Work in Waipi'o Valley, Hāmākua District, Hawai'i Island
Ross Cordy, Eric Komori, and Kanalei Shun
- 96 Tricks, Traps, and Tunnels: A Study of Refuge Caves of Hawai'i Island
Robert Bollt

FORUM

- 115 Science, Sanctimony, and Salvation: Considering a Unified Organizational Structure for Hawaiian Archaeology
Mike T. Carson

REVIEWS

- 130 Book Review: The Archaeology of Global Change: The Impact of Humans on Their Environment
Mike T. Carson

Copyright © 2005 by the Society for Hawaiian Archaeology. All rights reserved.
ISSN 0890-1678

EDITORIAL STAFF FOR *HAWAIIAN ARCHAEOLOGY*

- **Lead Editor: Mike T. Carson, SHA Publications Chair**
International Archaeological Research Institute, Inc., mcarson@iarii.org
- **Managing Editor: Mary C. Sullivan, SHA Publications Co-chair**
University of Mississippi, Oxford, hawaiianarchaeology@hotmail.com

BOARD OF DIRECTORS FOR THE SOCIETY FOR HAWAIIAN ARCHAEOLOGY

- **President: Hallett H. Hammatt**
Cultural Surveys Hawaii, hhammatt@culturalsurveys.com
- **Vice-president: John Peterson**
Garcia and Associates, Inc., jpeterson@garciaandassociates.com
- **Treasurer: Alan Carpenter**
Hawaii Division of State Parks, alan.b.carpenter@hawaii.gov
- **Communications Secretary/Webmaster: Jo Lynn Gunness**
University of Hawai'i, gunness@hawaii.edu
- **Recording Secretary: Christi Shaw**
U.S. Army Corps of Engineers, Christi.a.shaw@usace.army.mil
- **Education: Toni Han Palermo**
Hawaii State Judiciary, Toni.H.Palermo@courts.state.hi.us
- **Legislative: David Cox**
U.S. Army Garrison, Hawaii, coxd@schofield.army.mil
- **Standards and Ethics: James Bayman**
University of Hawai'i, jbayman@hawaii.edu

PUBLICATIONS INFORMATION

- **Cover Design: Mark de Guzman**
Scientific Consultant Services, Inc., mark@scshawaii.com
- **Layout Design: Mary C. Sullivan, SHA Publications Co-chair**
University of Mississippi, Oxford
- **Printer: Mike T. Carson**
International Archaeological Research Institute, Inc., mcarson@iarii.org

SUBSCRIPTIONS

- *Hawaiian Archaeology* is published annually and distributed to members of the Society for Hawaiian Archaeology. Memberships applications or *HA* request forms are available from the Treasurer.

EDITOR'S PREFACE

I am jubilant to introduce Volume 10 of *Hawaiian Archaeology* at the conclusion of my term as lead editor of this journal. Volume 10 continues with much the same organization, peer review, format, and layout that managing editor Mary Sullivan and I began in Volume 9. A few minor adjustments have strengthened the scholastic contribution of the journal, improved its appearance and readability, and reduced the overall production cost.

Readers will notice two minor alterations in the look of the journal. First, although the internal formatting and layout remain the same as in Volume 9, the page size has been reduced. Second, the color scheme for the front cover has changed. Volume 10 continues the use of color graphics where they provide useful information not possible in black ink or grayscale printing. Nonetheless, color printing incurs a certain cost that we prefer to minimize.

As I intimated in the preface to Volume 9, I have instituted one important change in Volume 10 regarding the peer review policy. Starting with Volume 10, the peer reviews are no longer anonymous, although we have maintained the policy started in Volume 9 to have at least two peer reviews for each manuscript, in addition to a detailed review by the lead editor of the journal. I made this change in recognition that anonymous reviews run counter to the goal to communicate ideas freely and professionally in a community of scholars. Primarily, the peer reviews provide constructive comments for authors to improve manuscripts prior to possible publication. Secondly, I have used the peer review comments to help form my own opinion as lead editor about whether or not to accept individual manuscripts for publication.

The successful production of Volume 10 is owed to the effort of a number of dedicated individuals. The authors and peer reviewers deserve credit for their input, without which Volume 10 would have no publishable content. Mary Sullivan labored tirelessly as managing editor of the journal to uphold high standards and to meet the demanding production schedule.

This journal would be virtually meaningless if not for its readership, and I am pleased to announce that readership has grown significantly, along with the commercial and institutional distribution, making *Hawaiian Archaeology* available more widely than ever before. Moreover, the information about titles, authors, abstracts, and key words for each article can be accessed through the Society for Hawaiian Archaeology (SHA) website <<http://www.sha.hawaii.edu>>, and the same information can be entered into library databases and other search engines, bringing *Hawaiian Archaeology* into the forefront of scholarly research. Finally, the current peer review status of the journal marks a substantial stride forward in national and worldwide recognition.

At the time of writing this preface in August 2005, Hawaiian archaeology is at an uneasy crossroads in at least four respects. First and foremost, the Hawai'i State Historic Preservation Division (SHPD) has been languishing with the departure of nearly all of its experienced personnel, and it has been struggling to meet the demands of its mission for the public and for mandated compliance with state and federal laws. Second, university programs face an uphill battle to provide updated curriculum and training opportunities for new generations of Hawaiian archaeologists about to be employed in cultural resource management, government compliance, and private contracting. Third, private

contractors, government agencies, and academic researchers engage in very different types of activities with variable understandings of professional research standards. Fourth, public opinions about Hawaiian archaeology more and more frequently involve misunderstanding and outrage about what archaeologists are doing to Hawaiian cultural resources.

I offer that the major problems for Hawaiian archaeology are largely the same as for archaeology as a discipline overall. Three questions are necessary. 1) What can archaeologists do to ensure the highest quality of their work? 2) What steps can be taken to be as respectful as possible of cultural beliefs and traditions? 3) What is the real value and significant contribution of archaeology in general and also of any individual project? The answers inevitably evolve with changing circumstances and experiences, and the issues are far too complex for this editorial preface. Nonetheless, these issues ought to be in the minds of every practicing archaeologist. At least some of these issues are considered directly or indirectly in the contributions to this volume of *Hawaiian Archaeology*.

Toward the end of the preface to Volume 9, I expressed my desire to broaden the scope of original contributions to the journal to reflect a diversity of perspectives and to convey a good sample of the highest quality of current research in Hawaiian archaeology. I believe that Volume 10 at least partially achieves these ambitious goals, and the authors are to be commended for their fine work. Volume 10 offers three *Thematic Essays*, three *Area-Specific Reports*, one *Forum* contribution, and one *Review* of a recent book.

Volume 10 opens with three thematic essays, each of which concerns technical or methodological procedures of general utility in Hawaiian archaeology. Marshall Weisler and Michael Haslam describe a recent microscope study of residues on volcanic glass artifacts, providing high-resolution data about the actual uses of these nearly ubiquitous artifacts. Mara Mulrooney, Thegn Ladefoged, Russell Gibb, and Daniel McCurdy demonstrate the utility of three-dimensional laser-scanning imagery for large and complex monuments, as illustrated by their work at Pu'ukoholā Heiau. I present a model for multi-faceted functional assessment of general applicability, and hopefully this model will encourage further research.

The three area-specific reports concern the islands of O'ahu and Hawai'i. For O'ahu, John Peterson presents a new geomorphological model of coastal Waimānalo, and this work undoubtedly will prove useful for future investigations in that area. For Hawai'i, Ross Cordy, Eric Komori, and Kanalei Shun provide a synthesis of archaeological resources of Waipi'o, based largely on their multiple field surveys and testing projects. Also for Hawai'i, Robert Bollt develops criteria to identify refuge caves, and he analyzes their distribution in relation to chiefly centers.

The single forum contribution for Volume 10 conveys my own vision of a unified organizational structure for archaeology as a discipline, specifically as practiced in Hawai'i. This work developed from what was originally my editorial preface for this volume, but the length of the text and its significant content made it more suitable for an article in its own right. I must express my gratitude to H. David Tuggle, Michael F. Dega, Peter Mills, D. Kyle Latinis, Christopher Monahan, J. Stephen Athens, and James M. Bayman for their critical comments to help fulfill the requirements of peer

review. Despite their variable degrees of agreement or disagreement with my opinions, they courteously provided honest and constructive suggestions to improve my work.

Volume 10 concludes with a review of a book concerning the archaeology of global change, edited by Charles Redman, Steven James, Paul Fish, and J. Daniel Rogers. The general principles and research issues in this book are of interest to all archaeologists, especially in island settings that arguably represent microcosms of global change.

In closing this preface, I would like to emphasize the joys of my experience with Volumes 9 and 10, as well as to announce my fondest wishes for the next editorial team. The new editorship was decided at the SHA annual meeting in October 2005 in Kaua'i. Meanwhile, potential authors and others making inquiries are directed to the SHA website <<http://www.sha.hawaii.edu>> for updated information about the journal. This experience over the past two years has improved my skills as a writer and researcher in more ways than I had anticipated. I eagerly look forward to see future volumes of the journal. Meanwhile, I hope you enjoy Volume 10.

- Mike T. Carson

Hawaiian Archaeology lead editor, Volumes 9 and 10



Pacific Legacy, Inc.

est. 1994

We have two offices in Hawai'i and three in California to serve our clients in the Pacific Basin and the Western U. S. Our services include:

- ① *archaeological survey, testing, and mitigation*
- ① *archaeological monitoring during construction*
- ① *site preservation and interpretation*
- ① *cultural impact assessments*
- ① *historical research*
- ① *architectural documentation*
- ① *development of monitoring, mitigation, and preservation plans*
- ① *emergency recovery of human remains and development of burial treatment plans*
- ① *artifact analyses and curation*

Contact us at:
<http://www.pacificlegacy.com>
Oahu: (808)263-4800
Hilo: (808)351-9560

NOTES FOR CONTRIBUTORS

Articles on Hawaiian prehistory or archaeology, and those that contribute to the advancement of method and theory as these apply to Hawai'i are considered for publication in *Hawaiian Archaeology*. Those wishing to submit an article for the journal should write the manuscript in Microsoft Word. The manuscript should be twelve-point, Times New Roman font; double-spaced; and e-mailed to hawaiianarchaeology@hotmail.com. It will be reviewed by the lead editor for content and then sent to no fewer than two reviewers. All graphics must be sent in JPEG form and be saved under the maximum DPI. Tables should be made in Word or Excel. Included in a submission should also be an abstract, full title, contact information for the lead author (including e-mail address, phone number, and mailing address), and a short biographical statement for all authors. Please format article in accordance with the Chicago Manual of Style's 14th Edition. Spelling of Hawaiian words should follow spelling in the most current edition of Hawaiian Dictionary (Pukui and Elbert), and spelling of Hawaiian place names should follow all Hawaiian synchronic elements as found in Place Names of Hawaii (Pukui, Elbert, and Mookini 1974).

Conventions for Radiocarbon Dates

In citing radiocarbon dates, *Hawaiian Archaeology* uses the following conventions: B.P. (before 1950) indicates an uncalibrated radiocarbon age; CRA (conventional radiocarbon age) indicates a radiocarbon age that 1.) uses 5568 as the ¹⁴C half-life, 2.) was measured against the NBS oxalic acid standard, 3.) uses 1950 as the zero date for radiocarbon time, 4.) is normalized for ¹³C, and 5.) has not been corrected for reservoir effects; B.C./A.D. indicates a measurement that has been calibrated to calendar years.

SOCIETY FOR HAWAIIAN ARCHAEOLOGY MEMBERSHIP FEES

Membership includes e-mail notices about upcoming events in Hawaiian archaeology, a discount on entrance to the annual conference, a copy of the *Hawaiian Archaeology* journal, among other benefits.

Institutional:	\$35
Professional:	\$30
Student:	\$15

Mailing Address: P.O. Box 23292, Honolulu, HI 96823-3292

Web Address: www.sha.hawaii.edu

Copyright © 2005 Society for Hawaiian Archaeology. All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of the Board of Directors, Society for Hawaiian Archaeology.