

Review Essay

Panel discussion: the underwater archaeology of Red Bay

Robert Grenier, Marc-André Bernier, and Willis Stevens (eds.). *The Underwater Archaeology of Red Bay: Basque Shipbuilding and Whaling in the 16th Century*, Ottawa, ON: Parks Canada, <http://www.publications.gc.ca>, 2007. 5 vols. CDN \$140.00, hardback; ISBN 978-0-660-19652-7.

Vol. 1, *Archaeology Underwater: The Project*. xxiv + 254 pp, illustrations, photographs, tables, site plans, notes.

This long-awaited, five-volume publication by Parks Canada presents the results of almost two decades of archaeological research prompted by the discovery of a sixteenth-century Basque whaling vessel in the harbour of Red Bay, Labrador. Based on eight seasons of fieldwork between 1978 and 1985 and subsequent years of analysis and background studies, this comprehensive report demonstrates how government-sponsored scientific inquiry can yield an academically sound and highly informative product. Published in French and English, the reasonably priced hardbound volumes illustrate how nautical archaeology can bring to light a forgotten segment of national heritage that was preserved for centuries under water.

Volume I, *Archaeology Underwater: The Project*, offers a chronological overview of the research with descriptions of initial discoveries at Red Bay, subsequent historical and archaeological investigations, underwater excavation and recording methodologies, and technological innovations in a subarctic marine environment.

The volume begins with dedications by the Canadian minister of the environment; the minister of tourism, culture and recreation; the director-general of the Basque Gipuzkoa Government; and the ambassador of Spain to Canada. Pioneer nautical archaeologist George F. Bass has contributed the foreword. A list of fieldwork and research participants is included in the first chapter. Project Director Robert Grenier sets the scene with a narrative on the archaeological discoveries at Red Bay and provides a brief essay about the challenges that the project faced.

The second chapter provides essential context with a fascinating historical account of sixteenth-century Basque maritime exploits in Labrador by Jean-Pierre Proulx, who explores the culture of the whale fishery from its development to its decline. Seasonal expeditions to *Terranova* allowed these fishermen to prey on migrating bowhead and right whales, turning a handsome profit in oil. We learn that the Basque fishing fleet in 1571 consisted of nearly 100 vessels that were crewed by some 4,000 fishermen. Financial backers who lent funds to outfit the annual voyages were paid in casks of oil and a percentage of profits. Insured, equipped, and crewed, the ships sailed as collectives to the Strait of Belle Isle, where shore stations were constructed to flense (i.e., cut up) the catch and render and stow the oil. According to some historians, this Basque fishery had a direct causal effect on the European discovery of the “new” world.

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Chapter 3 chronicles the “first dig” in the waters of Red Bay—as opposed to the “second dig” in the laboratory and office, excavating raw data from the field. Peter Waddell explains the precise provenience control he adopted for the shipwreck remains discovered in 1987 (presumed to be the whaling galleon *San Juan* that sank at Red Bay in 1565, but designated throughout the report as site 24M). James Ringer provides a chronology of underwater investigations, from the initial discovery of 24M to its final reburial. Included are site plans that track progress in each of the eight seasons of excavation. We learn that work on the 24M vessel triggered the discovery of two additional large ships, at least six small craft, and a possible wharf, all associated with sixteenth-century Basque whaling activities.

In Chapters 4 and 5, Waddell describes the project’s methodology and technology, from diving operations (which utilized hot-water suits) and mapping and recording techniques (which included stereophotogrammetry) to disassembly of the hull structure, surface recording of hull timbers (explained by Albert Wilson), dendrochronological sampling (i.e., dating timbers by counting growth rings), and reburial of the ship’s hull remains. James Ringer outlines various artifact recovery techniques, which included underwater moulding of the hull, and block lifting of fragile materials with plaster and polyethylene glycol.

The final chapter offers a multi-authored overview of the stratigraphy, features, and artifacts encountered during the excavation of the 24M site, as well as those encountered at the sites of three other vessels (27M, 28M, and 29M). Willis Stevens and Stephen Cumbaa describe a zooarchaeological survey of the whaling harbour that revealed profusions of codfish and whale bones. At the end of Chapter 6, a photographic essay includes more than sixty colour and black-and-white photographs of the Red Bay environment, the range of technical activities, features of the 24M site, excavation and conservation procedures, as well as views of artifacts and a fully-rigged ship model based on archaeological data. There is a folded site plan of the 24M wreck in a pocket inside the back cover.

This first volume of *The Underwater Archaeology of Red Bay* provides a tantalizing introduction to the next four volumes that contain the essential archaeological data and their subsequent interpretations from the “second dig.” Together, the five-volume suite marks a milestone in the study of the maritime technology that ultimately propelled European sailors across the globe. A well-organized and superbly illustrated report, it will remain an indispensable reference and guide for researchers who wish to share the results of their own investigations in the future.

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Volume II, *Material Culture*. x + 245 pp, illustrations, photographs, tables, notes.

Volume II introduces the analysis and interpretive phases of the material culture

recovered from the Red Bay Project. Although the archaeological evidence suggests the vessel was heavily salvaged, several artifacts remain. The vessel's material culture is unique in that it represents not a broad cross-section but rather reflects the more utilitarian aspects of sixteenth-century life, especially as it relates to whaling and whaling ships. The main types of artifacts include casks, earthenware and leather, but a variety of metals and organics were recovered as well. Each chapter consists of a brief introduction, basic descriptions of artifacts, an historical context and preliminary conclusions. Line drawings, photographs, and historical images help flesh out the text.

The first chapter of Volume II (Chapter 7), is titled the "Second Dig." According to Robert Grenier, the term "second dig" was chosen because the term helped relate the material culture to the excavation and to stress the metaphor "digging for information." As any archaeologist knows, some of the more intensive and more interesting research is done after the actual excavation. Indeed, the analysis of material culture from Red Bay was as complex and significant as the "first dig." Olive Jones adds a brief summary to the introduction to highlight the importance of each artifact group discussed in the volume's subsequent chapters.

In Chapter 8, Brad Loewen examines over 80 casks recovered from the Red Bay Project. Five sizes of casks and three sizes of open containers were identified. Analysis revealed valuable information concerning tool marks and construction of the casks, as well as personal identification marks that say much about the casks' use and reuse. In addition to an overall summary, Loewen provides detailed analysis of basic terminology, construction and metrology for casks that will be useful resource for anyone interested in historical coeprage.

Coarse earthenware and stoneware is the subject of Chapter 9. Gérard Gusset studied assemblages from both land and underwater sites and found two broad categories: coarse earthenware and coarse stoneware. Each item represented utilitarian vessels used for food or food preparation. Virginia Myles adds to Gusset's research with her analysis of 25 Spanish Majolica vessels recovered from both terrestrial and underwater sites. The chapter concludes with a sub-chapter on roofing tile fragments associated with whale oil production.

Chapter 10 is a discussion of the "410 cut and stitched leather fragments of leather footwear," which represent at least 49 individual shoes and boots (p.135). Not surprisingly, many of the fragments, according to Stephen Davis, suggest reuse and/or modification. Overall, the leather fragments comprise one of the largest collections of common footwear for the latter half of the sixteenth century.

Other organic material recovered from the Red Bay Project is the topic of Chapter 11. This chapter begins with Gérard Gusset's discussion of wooden tableware and other wooden artifacts, most of which relate to food preparation and service. The items include dishes, spoons, a knife, a spatula and a variety of small boxes. Other wooden artifacts include a weaving heddle, ("a type of weaving loom used to manufacture narrow fabrics" [p.216]) a hair comb and a whisk broom. Stephen Davis and Catherine Sullivan present short sub-chapters on each artifact. Rounding out Chapter 11 is John D. Light and Jonathan Moore's section on "Tools and Tool Handles."

They found that most of the handles were related to whale hunting. The final sub-section of this chapter is Davis' discussion of textiles, wicker and fibres. Although the conditions of Red Bay helped preserve several fragments none were large enough to make diagnostic conclusions.

Volume II ends with an analysis of metal artifacts. Phil Dunning discusses domestic metals such as pewter, brass, and copper fragments. Charles Bradley continues with a short examination of a coin-like object, known as a jeton or counter, "used with counting boards to make arithmetic calculations using principles similar to those of the abacus" (p.242). John Light concludes the final chapter with his analysis of fastening holes and augers.

While many of the individual chapters and sub-chapters include a conclusion, the volume would be greatly enhanced with a chapter devoted to overall conclusions that synthesizes information from each area of study. For example, research suggests that sixteenth-century Basque whalers were a part of the expanding Atlantic World that included trade with Portugal, Italy, France, England and Germany. Such conclusions, to varying degrees, are addressed in subsequent volumes, but some sort of overarching conclusion within this volume would greatly enhance the overall analysis. The significance of twenty years of research deserves a chapter that underscores the monumental efforts of those involved in the Red Bay Project. With this one criticism aside, the volume is an outstanding representation of material culture studies and the information presented should prove to be a springboard for further analysis.

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Volume III: *The 24M Hull*. x + 319 pp, illustrations, photographs, tables, site plans, notes.

The discovery of the "Red Bay Wreck" in Labrador by Parks Canada has brought to light a wealth of information relating to sixteenth-century Basque whaling activities in the New World. While this site includes components such as terrestrial whaling processing areas, a potential wharf, several large shipwrecks and multiple smaller boats used for whale hunting, the nautical archaeology of the "24M" hull comprises the primary focus of this impressive project. In fact, Volume III of the five volume series is devoted exclusively to the 24M hull.

Parks Canada archaeologist Brad Loewen authors most of the volume, starting with background material on sixteenth-century hull design, Basque ship types, and units of measure. Loewen summarizes the primary sources of information relating to vessels in this period, namely early ship treatises written by authors from England, Portugal and Spain. He argues that a distinction exists between ship design and construction methods, data on both of which can be gleaned from the archaeological record and used to compare with the published treatises. His synopsis of Renaissance hull design, noting particularly

the proportions shipwrights used to configure hull shape, keel length, deck length, beam, the rakes of stem and sternpost, etc., provides an excellent overview of how ships were conceptualized by their builders. This analysis is followed by a discussion of the various Basque ship types, whether the *nao* and *galeón* represented distinct vessels at this time (Loewen argues convincingly that they did), and the importance of the *codo de ribera*, a measurement standard found only on the Basque coast and used particularly for shipbuilding.

These conceptual principles are followed by archaeological data recovered from the 24M hull. In the second chapter, Loewen presents architectural information relating to the longitudinal profile of the hull, namely the stem, keel and sternpost. The keel of the 24M hull proved a fascinating find, as the garboard planks (the first outer hull planks attached to the keel) were actually carved into the single keel timber for much of its length, indicating as Loewen states, “The tradesman who sculpted this astonishing form from a single beech tree was clearly able to envision the form of the entire ship” (p.30). Following the discussion of the hull profile, chapters on the framing system, planking, hull fasteners and the rare example of a preserved square tuck stern offer substantial architectural details. By laying out the master frame components on a 1:10 scale, Parks Canada archaeologists were able to decipher key elements in the frame design, notably the shape of the floor and the four arcs that shipwrights would have used to construct the frame. Following these arcs on frames positioned forward and aft of the master couple allowed them to reconstruct how the shipwright laid out the skeletal structure of the ship, and in essence provides insight into how the sixteenth-century ship designer literally “conceived” the hull. Considering that for much of human history ships comprised the most complex structures generated by societies, attaining these insights into the planning and design of hull shapes should place the archaeological study of ship design square within the field of cognitive archaeology.

This reviewer was particularly impressed with the careful plotting of anomalous fasteners including iron nail holes and 35 milli-meter wood plugs to indicate positions of ribbands used to help shape the ends of the vessel, a technique described in contemporary texts but which is now seen archaeologically due to the careful recording and analysis by Parks Canada staff. In fact, this attention to detail can be seen in all aspects of the analysis of the 24M hull, including the planking, fastener patterns, stern construction, rudder and internal assembly, and much of this information is beautifully illustrated by line drawings, plan views, profiles, exploded views and isometric projections that aid the reader in understanding these complex structures.

The discussion of archaeological data recovered from the 24M hull is followed by a summary of the Basque shipbuilding trades, touching on sixteenth-century forestry and carpentry practices and the tonnage formulas used in the region at that time. Far from being extraneous, these topics bring to light the sheer complexity of sixteenth-century ship construction and the industries required to sustain it. For example, tree ring counts suggest that many of the futtocks used to build the ship were harvested at around forty years of age, and the natural shape of these timbers was put to good use in the structure of the vessel. This indicates a practice of forestry management geared to

generate frames with minimal waste. Details like this go far in supporting Loewen's thesis that Basque shipbuilding resulted from the integration of conceptual hull design and practical construction techniques that began in the forest with the felling of specific trees, continued to the shaping of timbers prior to transport to the coastal shipyards, and finished with the hull's assembly by the master shipwright.

This volume, and indeed the entire five-volume series of the underwater archaeology of Red Bay, is clearly a landmark study in the excavation and study of sixteenth-century wreck sites. Perhaps more importantly, the contextual research incorporating the Basque whaling industry, shipbuilding practices, timber trades, and the sheer detail of information relating to the 24M hull, will serve as a major reference for nautical archaeologists, historians, model builders, and anyone desiring a greater understanding of the complexities of historic shipbuilding.

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Volume IV: *Rigging, Vessel Use and Related Studies*. x + 391 pp, illustrations, photographs, tables, site plans, notes.

The two-decade-long study of the sixteenth-century Basque vessel in Red Bay, Labrador, called the 24M vessel, is one of the most thorough studies of any shipwreck performed to date. Through careful excavation and analysis, Parks Canada archaeologists were able to record minute details of the vessel's construction and shipboard customs, greatly enhancing our knowledge of maritime architecture and culture in the Age of Discovery and Exploration. The results of this long investigation are presented in a multi-volume set that, while years in the preparation is well worth the wait. Volume IV is dedicated to Rigging, Vessel Use and Related Studies.

Carrying on from previous volumes, Volume IV begins with Chapter 17, dedicated to rigging and deck hardware. As the authors explain, the hundred years between the mid-fifteenth century and mid-sixteenth century brought striking changes in vessel design and in rigging technology. The collection of rigging elements recovered from the 24M vessel is divided into components such as standing blocks, running blocks, and rope and cordage with descriptions and discussion of each type. A possible rigging scheme is provided by Charles S. Bradley, based in part on the rigging components recovered. Illustrations of the reconstructed standing rigging, running rigging, and sail plan augment and complement the text. Deck fittings associated with rigging, such as cleats, pin rails, and sheaved timbers, are included in the discussion along with ground tackle including the capstan, cathead, and anchor.

Chapter 18, "Further Analysis Relating to the 24M Vessel," describes some of the ancillary studies undertaken by researchers that are related to the work in Red Bay. These include a discussion of caulking materials and protective coatings used in sixteenth-century Iberian ship construction, evidence for which was found on the 24M

hull. The Basque iron industry, which provided fastenings for shipbuilding, is presented by John D. Light, including a description of mines and forges as well as a thorough explanation of fastener types and production. Chapter 18 concludes with Charles D. Moore's and Albert E. Wilson's discussion of the use of models as tools for research and interpretation, using models created of the 24M vessel as examples to explain their utility and value.

Chapter 19 is devoted to "Shipboard Activities and Vessel Use," a discussion of daily life onboard a sixteenth-century Spanish Basque whaler in Labrador by Willis Stevens, Daniel LaRoche, Douglas Bryce, and R. James Ringer. Based on information recovered during investigations, this chapter presents evidence for food-related activities (both material culture and food remains), personal possessions and occupational activities, operational activities such as navigation, and armament for defence. The chapter also presents Stephen L. Cumbaa's description of harbour activities in which the ship was engaged when it sank, primarily whaling and the processing of whale products. These activities were directly related to the ship's cargo of whale oil contained in casks; the remains of many casks were found still in position. Chapter 19 concludes with discussions of studies of lading practices, cask typology, cargo capacity, stowage, and ballasting.

Marc-André Bernier presents a detailed account of how the wreck site was formed in "Site Formation Process and Break-up of the 24M Vessel" (Chapter 20). Methodology of the study is presented, along with limitations, as are results of analysis of lateral, vertical, and longitudinal movement of ship timbers throughout the site. Specific timbers and ship elements are described relative to their original and discovered positions, revealing intriguing clues to the ship's wrecking and disarticulation. The effects of water, ice, and human intervention are also included.

"Dating and Identification of the Red Bay Wrecks" is presented by Bernier and Robert Grenier in Chapter 21. Although the years of research and investigation have provided much fuel for speculation, a specific identity has not been confirmed for the 24M vessel (or for the 27M and 29M sites). This chapter presents the hypothesis the 24M vessel is a ship called *San Juan*, wrecked while fully loaded in 1565 when a gust of wind broke its moorings. Both archaeological and archival evidence is discussed, although the authors are careful to explain that, while the evidence is persuasive, a confirmation has not been reached. Another Basque whaler discovered in 2004 may further cloud the issue.

Ryan Harris and Brad Loewen describe one of the little whaleboats discovered with the 24M vessel in Chapter 22, "A Basque Whaleboat: Chalupa No. 1." One of three discovered in direct association with the main wreck, these small craft provided the only archaeological evidence, to date, of their type. Chalupa No. 1 is the best preserved of the three and was discovered nearly in its entirety under the wreck's stern. This chapter presents the site formation processes that led to the whaleboat's preservation, as well as a description of hull elements and lines drawings of this unique craft.

Conclusions for the report are presented in Chapter 23 by project principal investigator Robert Grenier. While not repeating the conclusions for each section of the

report, included at the end of every chapter, Chapter 23 seeks “to highlight some of the methodological and scientific aspects of the Red Bay excavation and the various ways in which the project has innovated” (p.381). These include the seminal study of casks, the decision to completely dismantle the wreck for analysis, and success of the recording system. A final Epilogue (Chapter 24) by Cindy Gibbons completes the report.

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Volume V: *Appendices, Glossary and Bibliography*. x + 287 pp, illustrations, photographs, tables, notes.

The final volume of the five-piece set is dedicated to presenting the end matter for the entire report. While each chapter and volume contains specific notes, Volume V presents as appendices additional detailed information that, while certainly important, would otherwise clutter the previous volumes. Divided into fourteen sections, each appendix is dedicated to a specific aspect of Parks Canada’s research into sixteenth-century Basque shipbuilding, sailing and whaling by Michael M. Barkham, as well as particular studies of the wreck site. These include Willis Stevens’ methodology for the field lab, Peter J.A. Waddell’s wood identifications, and Daniel LaRoche’s synthesis of the dendrochronological studies.

Charles S. Bradley presents reports on rigging components from the 24M hull, as well as from a survey of the harbor and the 27M hull site. Bradley’s work also includes an analysis of tool marks and a thorough catalog of fittings and rigging components by function and provenience. This information may be compared to the rigging of a 500-ton *nao* by Suzanne Beauvais, which is also included. John Light’s studies of fasteners from the 24M site and of the ship’s steering mechanism complete the specific appendices.

A meticulous and extremely useful glossary is provided by Marc-André Bernier, Charles D. Moore, and Brad Loewen. Focusing on “selected terminology applied to specific features of 16th-century Basque shipbuilding as revealed by the 24M ship remains” (p.227), the glossary provides terms in English, French, and Spanish, as well as the description/definition of the term and is augmented by illustrations. A bibliography providing reference information for works cited throughout the report completes Volume V and offers avenues for interested readers to pursue further research.

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