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UNDERWATER RESEARCH AT RED BAY, LABRADOR: A SUMMARY OF THE 1981 FIELD SEASON

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Introduction

The Red Bay Project is a multidisciplinary study of a sixteenth-century Basque whaling station located in the small Labrador coastal town of Red Bay. The study is centred around the archaeological investigation of Basque material-culture remains found both on land and underwater. In 1981 a formal agreement was signed between Parks Canada and the Province of Newfoundland and Labrador giving the Marine Excavation Unit a clear mandate to undertake research on the underwater remains of the whaling station and of the San Juan, a whaling ship which sank in Red Bay harbour in 1565. This report summarizes the underwater research conducted in 1981 by the Marine Excavation Unit of Parks Canada with assistance from the Material Culture Research Unit and Conservation Division. Further assistance was provided by Manual Izaguirre, a Basque researcher and diver who worked in Red Bay during most of the 1981 field season.

The principal objective of the field season was to excavate the midship area of the San Juan with the goal of collecting important interpretative data on the pattern of cargo stowage as well as gaining an insight into areas of architectural significance, including the ship's pump well and pump tube, the mast step, and the overall structural characteristics of the hull. Other objectives included the completion of the excavation around the ship's transom to prepare it for raising and recording on the surface, a determination of the structural relationship between the keel and stern post, the completion of the 1980 shore trench, a continuation of the harbour survey and the excavation of a small exploratory trench located just off shore from a major Basque try-works and wharf complex.

There were 825 dives made onto the site which resulted in a total of 1757.40 underwater hours. This large number of hours was possible due to the use of a hot-water-suit system which sustains a diver at a constant temperature of 42° C, offsetting the effects of the cold Labrador water.

Excavation

Midship Area

The midship area contained the bulk of the cargo of whale-oil casks (Fig. 1). This area also contained the pump tube and pump well assembly along with the mast step. The excavation was therefore designed in anticipation of problems caused by the presence of these artifacts and features. The foremost problem was the large number of casks which due to their complete collapse and disassembly over time produced a formidable recording operation. Literally thousands of staves and other cask parts were scattered across the wreck site although some did remain as part of

complete assemblages. Initially in 1979, an individual stave was mapped in relation to its location within a particular assemblage. This procedure was extremely time-consuming both underwater and on the surface when researchers tried to reassemble the casks. Subsequently a new recording procedure was introduced in 1981 which emphasized casks instead of staves and which provided for an accurate definition of each cask's outline as well as its spatial and stratigraphic position within the vessel's hold. This recording was supplemented by photographic coverage of the individual cask assemblages which also recorded the relationship between those assemblages. The result was an accurate three-dimensional recording of cask assemblages which revealed the precise nature of the stowage pattern.

Cask Stowage Pattern (Ringer 1982). There were at least three tiers of casks (Fig. 2). The bottom tier was laid in rows directly onto the vessel's ceiling planking and/or futtocks, with the longitudinal axis of the casks running parallel to the fore and aft line of the vessel. The second tier was similarly aligned although the casks' positions were offset so that the widest part of the upper cask filled the hollow formed by the juncture of the ends of the four casks below it. In this manner the casks formed an interlocking network that would have been resistant to shifting. This stowage pattern represents the general alignment of casks within the vessel's hold; however, the pattern was disrupted in the area of the pump well and pump tube assembly (Fig. 3). At this location two casks were placed aft of the pump well on either side of and transversal to the keelson. A smaller cask was placed on the keelson between the two traverse casks. A third transverse cask was placed forward of the pump well on the port side of the keelson while the remaining casks surrounding the pump well followed the general alignment pattern.

Ballast stones (Audy 1982). The casks were supported in a variety of ways through the use of billets, chocks, wedges and ballast stone. Ballast stone, which consisted primarily of limestone, was found throughout the entire central hull area. Its principal function was to act as support beds for the casks with the stones being packed on either side of casks to prevent movement from side to side. In the archaeological record these beds were revealed as long lines of ballast running longitudinally along the bottom of the vessel's hold (Fig. 4). This type of support was also used on the second tier of casks and possibly the third tier.

Apart from being used as support beds on the ceiling planking, ballast stones were used for the same purpose to fill in the open spaces between casks. Further, the stones were also placed between futtocks in those areas not covered by ceiling planking, thus forming a relatively level and continuous support surface throughout the hold up to the beginning of the second futtocks.

Pump Assembly (Waddell 1982). One of the major artifacts recovered in 1981 was a 2.39-m section of pump tube (Fig. 5). It was constructed from a single piece of beech which was subsequently squared and the corners bevelled. The outer diameter was 26 cm with an inner bore diameter of 12 cm. A plunger along with two wooden shafts, representing the pump's plunger spear and connecting spear, were found within the bore. The plunger consisted of 21 leather discs of varying diameters which were placed on the plunger spear in a bullet-like shape to facilitate the downward thrust in the tube bore and the passage of water around and above the discs. The base of the tube was located next to the pump sump, a circular hole cut into the port side of the keelson aft of the mast step (Fig. 6).

A foot valve and an associated flapper were excavated from the sump. The valve was manufactured from beech wood in the form of a stepped cylinder so that the upper portion, which was 11 cm in diameter, would slide into the bore at the base of the pump tube. The leather flapper would have been fastened to the top of the

valve and served to block the bore of the pump tube which was now reduced to 6.5 cm, the bore diameter of the foot valve. The pump was enclosed by a well or box with measurable dimensions of 97 cm by 97 cm. The well extended over a portion of the mast step which was incorporated into the keelson as an expansion of the keelson. The step was made of a rectangular recess cut into the top of the keelson and which acted as a large mortice into which the heel of the main mast was set.

Stern

Transom (Grenier 1982). The transom was completely excavated and raised for surface recording. A preliminary investigation into the surrounding structure was started and proved to be extremely important in the planning of the 1982 field season at which time the complete stern area is expected to be fully excavated.

The transom was lying flat on the harbour bottom located behind and below the broken end of the sternpost. It consisted of five transom beams rebated to fit over the inner face of the sternpost, as well as seven outside planks on the port side and five outside planks on the starboard side. These planks all fitted on the rabet of the stern post in a v-shaped pattern. This design, sometimes called the "square-tuck," is typical of the sixteenth and early seventeenth centuries. The transom was disassembled following underwater recording and then brought to the surface where it was reassembled for drafting and photographic recording (Fig. 7).

Further excavation beneath and around the transom has revealed a large number of structural timbers including the lower end of the port side "fashion piece" (a curved timber forming one side of the stern), a section of mast or yard, frame members, exterior planking, numerous unidentified timbers and, perhaps most important, the ship's rudder. This significant discovery was only partially excavated; however, the excavation did succeed in uncovering the base of the rudder which had been located adjacent to the keel. It was noted that the base was contoured to fit over a short, aft extension of the keel which served to protect the forward bottom end of the rudder from possible damage in case of grounding. Complete excavation and recording of the rudder is expected to take place during the 1982 field season.

An unexpected artifact, found during the stern excavation, was the remains of a small boat with many of its principal structural elements still associated. The boat's stem or sternpost, keel and three lower strakes were all located more or less in their original positions. Approximately one metre of the boat's length has been uncovered, the remaining length lying beneath the large rudder of the San Juan. While recovery may prove difficult, archaeologically the small boat and its contents represent a sealed Basque context with extremely high interpretative value.

Artifact Discussion

Cask Material (Bradley 1982). By far the most numerous class of artifacts was cask parts. Fifty-two nearly complete casks were recovered and are presently undergoing analysis and conservation. Preliminary research indicates a similar construction technique as that encountered during previous years of excavation (Ross 1980). The predominant cask size was the barrica, although several smaller, "one-third" barricas were also found. Of particular interest within the cask material was the discovery of one stave substantially longer than a barrica stave. It has been tentatively identified as being from a pipa. The large size and its context (above the first deck level) indicate that such a container probably held provisions rather than whale oil. Further research is planned to determine overall size and function of the pipa.

Ship's Fittings and Rigging (Bradley 1982). Thirty-seven artifacts representative of the ship's fittings and rigging were recovered from the San Juan. At least six functional groupings were identified: standing blocks, running blocks, components of the rigging, tackle and sails, rope and cordage and unidentified material.

Ceramics. The ceramic collection consisted of two nearly complete coarse earthenware vessels of the holloware form and a limited number of isolated coarse earthenware sherds. One of these vessels was particularly interesing primarily due to its unique form (Fig. 8). All examples were located outside the cask deposit near the first deck level in the midship area.

Treen. Seven wooden artifacts including two platters, one incomplete bowl, three small boxes of undetermined function and one small spatula-like artifact were recovered from the central hull area of the San Juan (Figs 9 & 10). There was also one incomplete bowl found outside of the wreck adjacent to the stern (Fig. 11). Of the seven artifacts found within the vessel, five were located above the first deck level in the midship area.

Leather. Two nearly complete shoes and nine fragments were recovered from the wreck. The shoes and six of the fragments were all found near the first deck level.

Textiles. Seven fragments of straw-like matting and a fibrous bundle bound together with sizing were found near the first deck level.

Faunal Remains. The analysis of faunal remains is being undertaken by Stephen Cumbaa of the Zooarchaeological Identification Centre, National Museum of Natural Sciences. This study involves the analysis of all faunal remains in and around Red Bay harbour with particular emphasis on whale species identification, whale-processing techniques and carcass-disposal patterns. However, the study is also concerned with other classes of faunal remains that to date have included codfish, bird, seal, polar bear, black rat, domestic pig and domestic dog. The last two specimens are from questionable contexts. Of particular interest during the 1981 field season was the discovery of specific codfish bones within the San Juan representing salt cod. Further, these bones were intermixed with what is thought to be the remains of a large black rat and which would represent one of the earliest confirmed dates for the arrival of old-world rats in North America. The remains were also found in association with a type of wicker material, possibly from a basket.

Shore Trench

The excavation of the shore trench which began in 1980 was completed in 1981. The emphasis throughout the excavation was on stratigraphy, in an attempt to understand the relationship between the wreck and the Basque shore station. However, it soon became apparent that both the stratigraphic data (strata and their interfaces) and the plan data (artifacts, features and faunal remains) were more representative of the Basque occupation on the land site and relatively little information was being gathered concerning the wreck. This pattern continued in 1981 with a large and diversified collection of artifacts and faunal remains, the majority of which appeared to be secondary refuse from the shore-based operation. Also at this time an attempt was made to extend the shore trench onto the land to link up with the excavation units of that operation. However, the attempt was short-lived as a large amount of tightly packed rock forced closure of this excavation.

The shore trench excavation was successful in tying together the wreck and

deposits from the shore station. The various strata uncovered were formed primarily by discard processes involving secondary refuse. The result was seen in the formation of an excellent stratigraphic record, indicative of events on Saddle Island, which revealed several interesting periods of activity at the shore station. A large build-up of wood chips represented an initial period of construction, followed by an extensive deposit of codfish bones indicative of a substantial cod-splitting operation contemporaneous with whaling and finally a large amount of rock collapse thought to be rubble from the Basque shore structures.

Harbour Survey

This survey consisted of two distinct operations: a free-swimming bottom search and the partial excavation of an exploratory trench referred to as the wharf trench (Fig. 12).

The free-swimming search was conducted along the north shore of Saddle Island east of the wreck site. It encompassed the area directly in front of a major oven complex used by the Basques for "trying-out" the whale blubber. During the course of the survey few whale bones were recorded, such as five ear bones, a few small skull fragments and a vertebra fragment. It appeared that harbour silts had long since covered any trace of the Basque whale butchering.

The survey also located a few loose timbers, probably representative of drift material from the wreck site. These timbers all appeared to be oak and some showed evidence of fastenings (treenails and nail holes).

The wharf trench was an exploratory excavation within the surveyed area for the purpose of examining the remains of a possible Basque "cutting-in" stage or wharf. These remains were visible along the shore of Saddle Island during periods of low tide and consisted of piles of rock ballast and morticed timbers. A 2-m-by-6-m grid was installed a few metres off shore at a depth of about 3 m. The grid was aligned perpendicular to the shore line and directly in front of the wooden timbers. While only one sub-operation was excavated, an interesting pattern of artifacts was observed. The artifact collection including whale bone was limited to flipper elements, concretions, numerous wooden artifacts, some of which may be small boat parts, and coarse earthenware roofing tiles. The presence of concretions, which were found in relatively lesser numbers on the wreck site, may represent tool loss during the flensing operation. More excavation of the wharf is planned for the 1982 field season.

Summary

The 1981 field season resulted in the complete excavation of the vessel mid-section. This included the recording of a large number of casks which resulted in a better understanding of the way in which the cargo was stowed. Detailed recording was also carried out on the pump well and pump tube as well as the mast step. The vessel's transom was raised and recorded as was an associated "fashion piece." Major discoveries near the stern included the large oak rudder, a section of mast or yard and, perhaps most intriguing, a small boat. Artifacts recovered from the San Juan in 1981 are beginning to provide a first-time look at shipboard life. Such things as wooden bowls and platters, holloware storage jars, food items including salt cod and various nuts, leather footware and, finally, rats all contribute a tiny image to a much larger picture of what life was like on board a sixteenth-century Basque whaler.

Excavation was also carried out in several areas outside the wreck which

included the completion of the shore trench, continuation of the harbour survey with particular emphasis placed on the excavation of a wharf trench. Archaeological research is scheduled to continue in 1982 with planned excavation of the vessel's stern and further selected investigation of the harbour's cultural resources.

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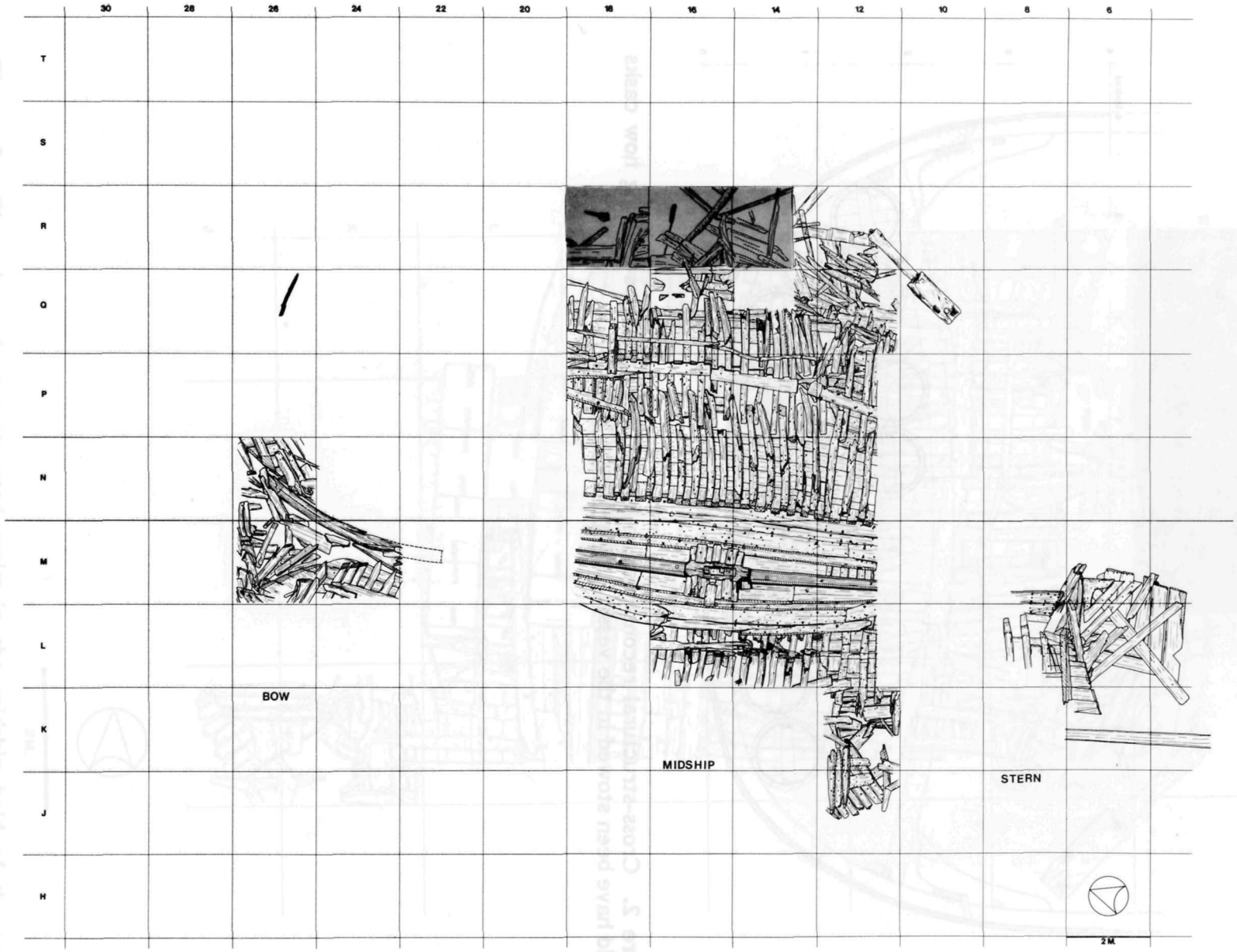

Figure 1. Structural plan of the site. (Drawing by S. Epps.)

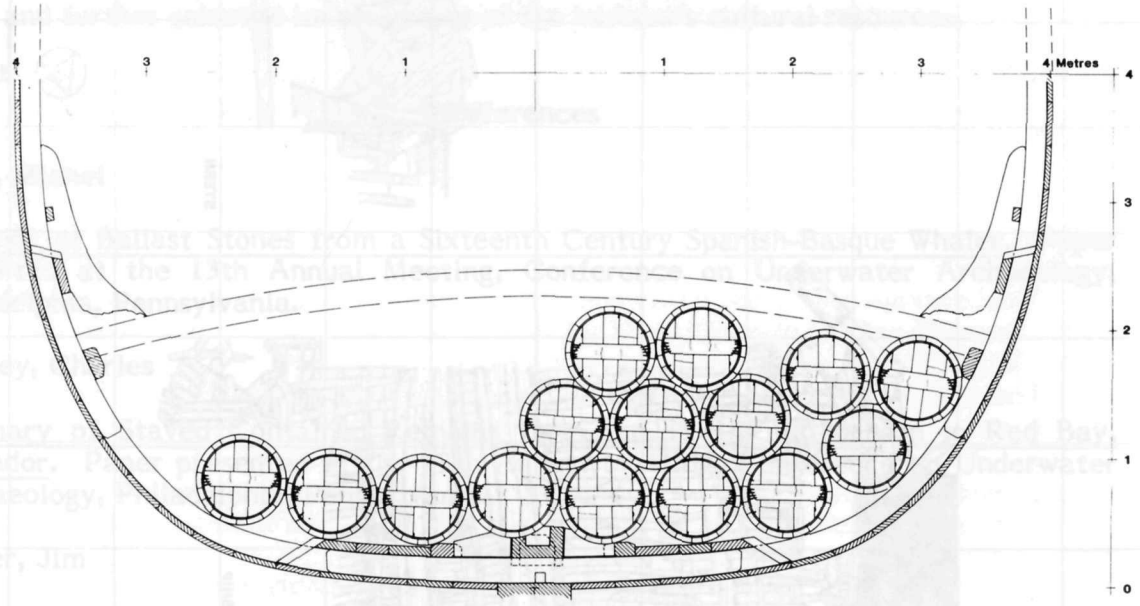

Figure 2. Cross-structural reconstruction of the hull amidships showing how casks would have been stowed in the vessel. (Drawing by S. Epps.)

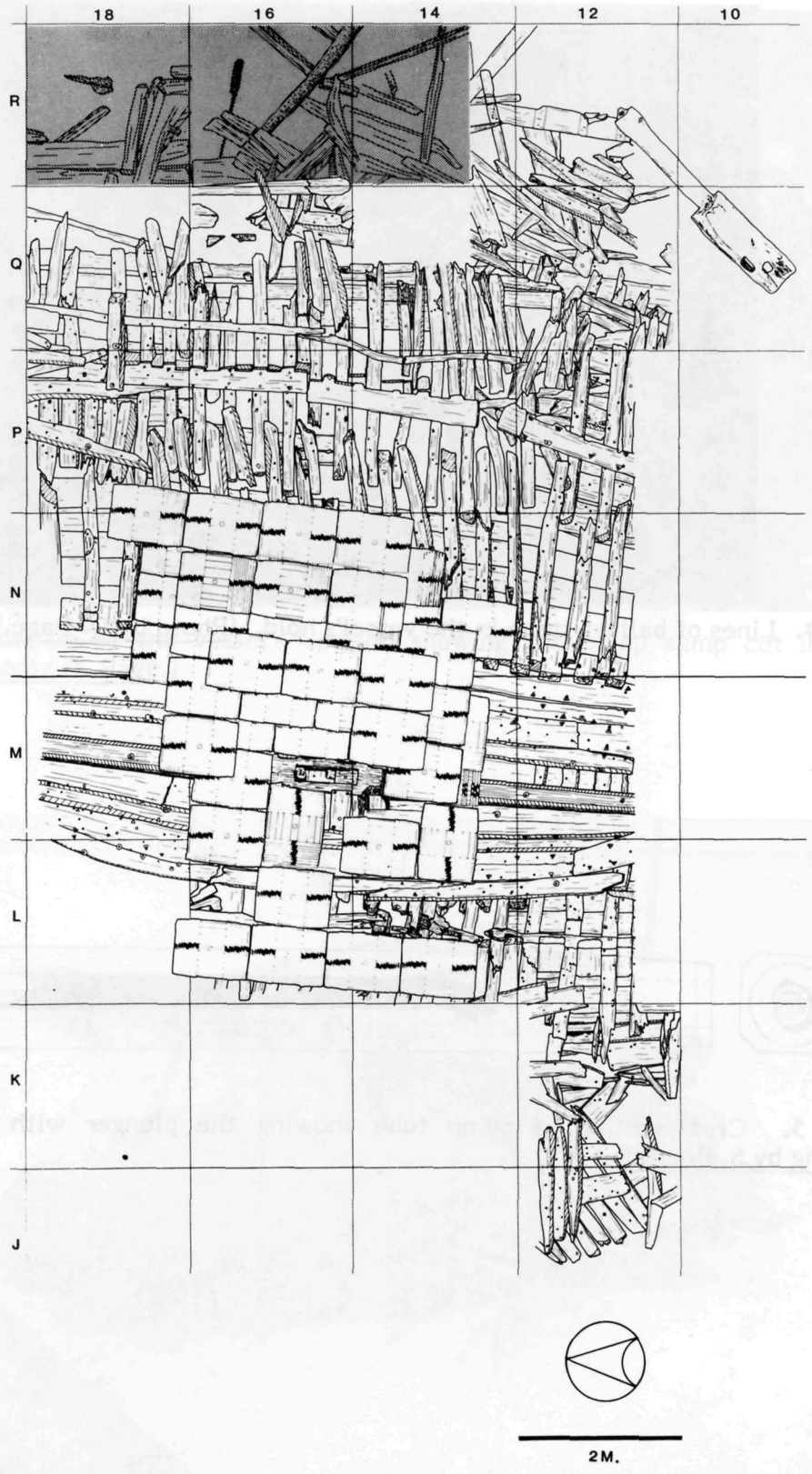

Figure 3. Plan view of reconstructed casks in the midship hold of the vessel. (Drawing by S. Epps.)

Figure 4. Lines of ballast stone in the vessel's hold. (Photo by D. Pagé.)

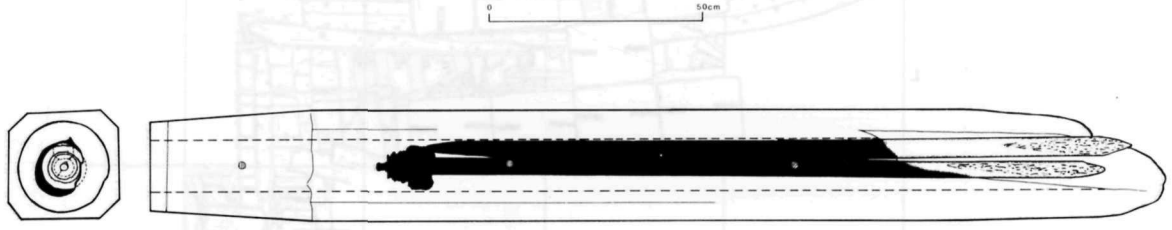

Figure 5. Cross-section of pump tube showing the plunger with broken shaft. (Drawing by S. Bourque.)

Figure 6. Close-up of the vessel's keelson showing the pump sump cut into the keelson. (Photo by D. Pagé.)

Figure 7. Reassembled transom on the deck of the research barge. (Photo by R. Grenier.)

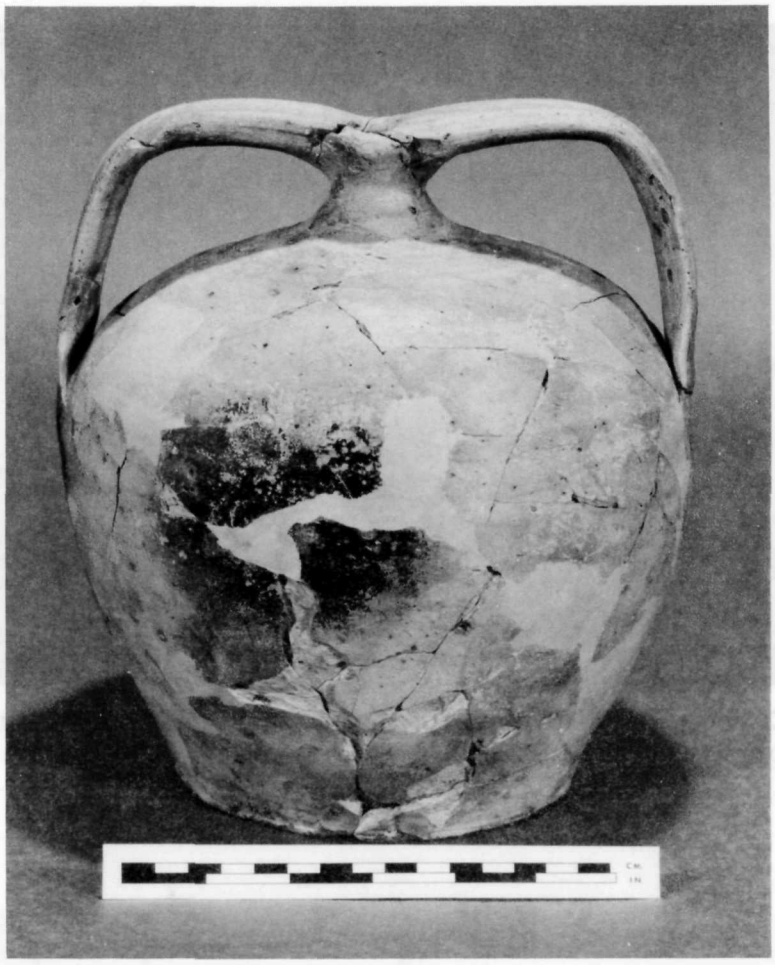

Figure 8. Ceramic vessel recovered from the first deck level of the San Juan. (Photo by R. Chan.)

Figure 9. Wooden platter from the first deck level of the San Juan. (Photo by R. Chan.)

Figure 10. Unidentified wooden box from the first deck level of the San Juan. (Photo by R. Chan.)

Figure 11. A partial wooden bowl with an unidentified mark on the bottom. (Photo by R. Chan.)

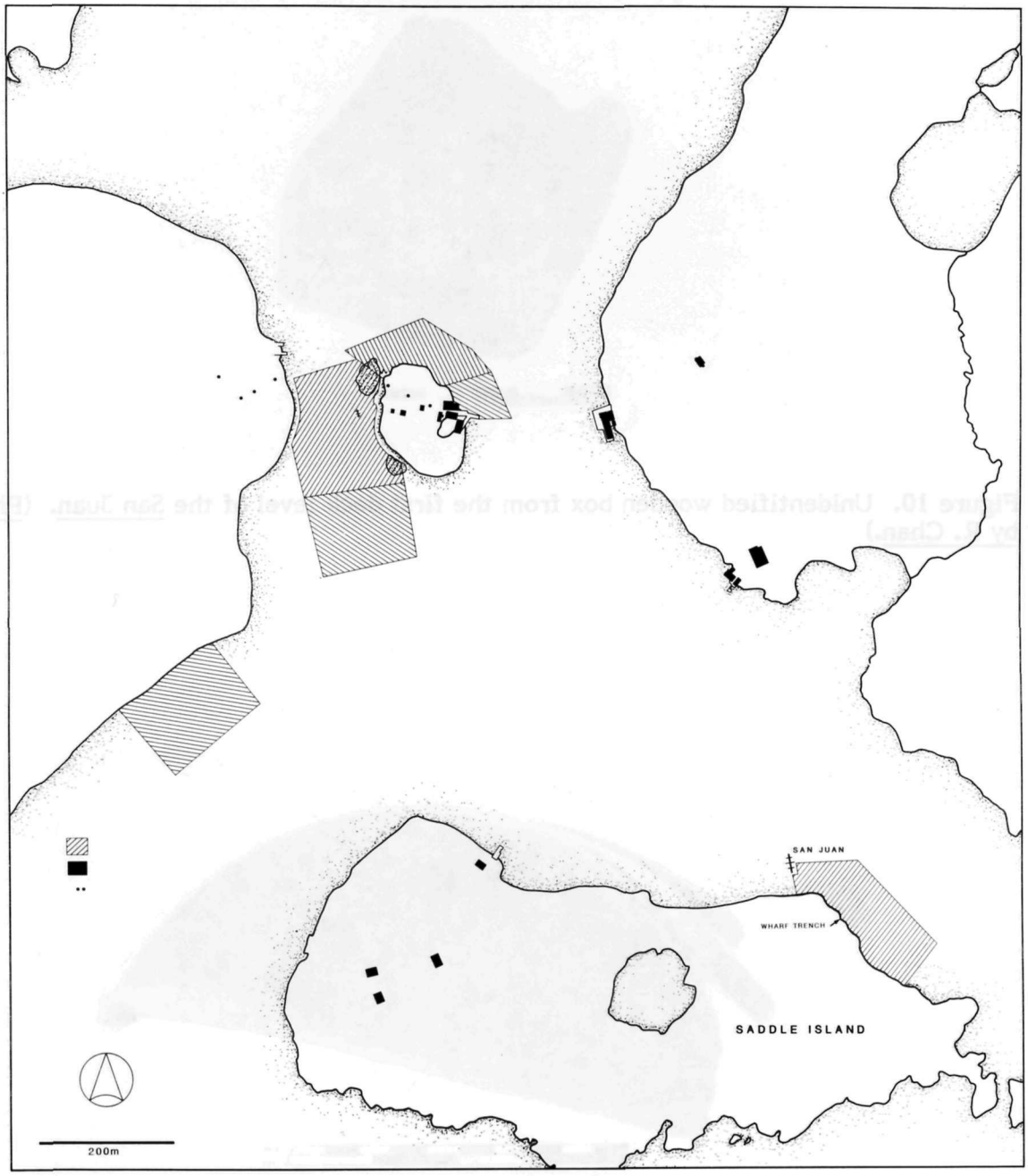

Figure 12. Map of the areas surveyed in Red Bay harbour. (Drawing by S. Epps.)

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