

A SUMMARY OF MARINE ARCHAEOLOGICAL RESEARCH  
CONDUCTED AT RED BAY, LABRADOR:  
THE 1984 FIELD SEASON.

James Ringer  
Parks Canada

INTRODUCTION

During 1984, Parks Canada's Marine Excavation Unit, under the direction of Robert Grenier, undertook the last field season of major excavation on the suspected Basque whaling vessel San Juan. This underwater excavation is part of a joint project with Memorial University of Newfoundland to investigate the remains of the sixteenth-century Basque whaling enterprise in the southern Labrador coastal village of Red Bay. An archaeological team from Memorial University, led by Dr. James Tuck, is currently unearthing the remnants of the Basque whaling station on Saddle Island in Red Bay harbour. Parks Canada has focused its work on the submerged remains of the San Juan, (Figure 1) which sank in 1565, and on other underwater traces of Basque whaling activity. The underwater investigations are conducted under an agreement with the Province of Newfoundland and Labrador.

The 1984 field season, the final one of a six year excavation program, was the most ambitious to date. Employing fifteen full-time divers, 1649 dives were made totaling 3549 hours. The major thrust of this research was the completion of excavation and disassembly of the remainder of the starboard side, followed by excavation below the hull. Also excavated was a substantial area around the periphery of the intact hull structure. As the work on the wreck site proceeded more quickly than first anticipated, it was decided to disassemble the rest of the port side structure and continue the excavation below this side of the hull. Associated with the excavation of the ship itself was the continuation of the survey of Red Bay harbour. Included here were the excavation of a further trench between the San Juan and the shore of Saddle Island, test excavation on the large vessel discovered last year, further towed searches over the harbour bottom, and the excavation of a smaller wooden vessel located near Penny Island.

### THE PORT BOW AREA

The objectives of the port bow excavation were twofold: first to uncover the remainder of the cask deposit in this area; and secondly, to expose the rest of the articulated hull structure. The cask deposit was generally badly disturbed. Most of the casks were badly broken and incomplete making it difficult to determine individual cask assemblages. As well, timbers and timber fragments were found on top of and mixed in with casks. In most cases casks did not appear to be in their original locations. The disturbed condition of the cask deposit, it is assumed, resulted from the breaking away of the port bow section from the starboard side.

Two types of casks were recovered during excavation. The predominant type was the barrica which was the most common cask size found throughout the cask deposit on the rest of the ship. A few examples of a smaller capacity cask were also retrieved. What role this size played in the cargo lading system is imperfectly understood at this point.

Because of the disturbed nature of the cask deposit, the stowage pattern was difficult to discern. All that can be said at this time is that, of the cask assemblages uncovered, all appear to be from the ground tier or lowest layer of casks. It seems reasonable to assume that the lading pattern here would resemble the pattern found in the rest of the ship. According to this pattern casks were stowed horizontally in a fore-aft position in rows across the hull. At least three distinct layers of tiers of casks have been found, with each successive tier offset and between the casks below it, thus forming an interlocking network.

Below the casks a great deal of ballast stone was recovered. Far from being a simple bed upon which the casks were laid, the ballast formed an integral part of the cargo lading system. In this system the stones were formed into fore-aft rows between which the casks from the bottom layer rested. The rows of stone prevented the sideward rolling of the casks. Besides the rows of ballast, stones were also placed between the futtocks beyond the ceiling planking. The pattern of ballast utilization noted for the port bow area is

identical to that found in the rest of the ship's cask deposit.

Once the overburden and cask deposit was removed, the port bow hull structure was revealed, (Figure 1). This consisted predominantly of futtocks and outside hull planking. The port bow was extant up to approximately the ends of the first futtocks. This was not as complete as the starboard and seems to be due to the more exposed nature of the port side. As mentioned above, the port bow has broken away from the starboard side of the ship. Further evidence of the stress placed on the port bow can be seen in the ceiling planking which had been mostly broken and dislodged.

At the forward edge of the port bow lay a hull section positioned transversely to the fore-aft line of the vessel (Figure 1). The section was composed of broken futtocks and outside hull planking. The plank ends were bevelled to fit into the stem rabbet leading to the conclusion that this was part of the upper port bow hull that separated from the rest of the intact hull and settled in this position.

Cask parts were the most abundant artifacts recovered from the port bow area. Other common artifacts included ceramic roofing tile fragments, rope fragments and pieces of leather. Unusual items consisted of pieces of cork, likely for the manufacture of cask bungs, and a cask peg with metal banding. Many other cask pegs have been found but this is the only example bound with metal. A unique find was a copper-alloy spigot key with the top part fashioned into a fleur-de-lys (Figure 2).

Faunal remains from the port bow excavation included a number of whale bones, cod fish bones and one unidentified bird bone.

#### STARBOARD UNDERHULL AREA

A major project of the 1984 field season was the continuation of the disassembly of the starboard side and excavation below the hull. Previously, the starboard side had been disassembled from the stern to the mid-ship area and excavation followed. In 1984 the rest of the forward starboard side was disassembled up to the keel, followed by underhull excavation. These underhull investigations have proved exceedingly rich in structural pieces and artifacts.

Immediately below the outer hull planking the excavators encountered a mass of structural timbers. These timbers included wales, skids or fenders, planking, deck beams, supports and a variety of unidentified pieces. It seems that most of these timbers were originally from the upper parts of the ship which, subsequent to the sinking, became detached from the vessel and were pinned beneath the starboard side when it collapsed outward.

A particularly important discovery consisted of a wale and associated timbers that appear to have formed the starboard fore channel assembly. The wale or channel was a curved plank 4.5 m long, 20 cm wide and 8 cm thick. This piece had three notches cut into the inner edge: one near either end and one 1.3 m from the forward end. In situ observations suggest that these notches fit over short vertical timbers that presumably were attached to the side of the ship. Horizontal wales passed through notches cut in the vertical pieces. Smaller triangular supports were attached to the outside face of the vertical timbers and fit underneath the channel.

Associated with the channel were three metal-banded heart blocks with accompanying concretions. The concretions contained remains of chain links that would have connected the heart blocks to the side of the ship. The metal-banded heart blocks would have been paired with rope bound heart blocks to maintain tension on the foremast shrouds. The use of pairs of blocks rather than deadeyes has already been described for the mainmast shrouds. In the case of the foremast it seems that only three such pairs of heart blocks supported the shrouds. Unfortunately, the upper rope-bound heart blocks were not recovered.

Other rigging elements retrieved from the starboard underhull area included two single-sheaved wooden blocks and a large toggle. Both of the single blocks were similar to other single-sheaved blocks found on the site. The toggle was unique because of its size. Much smaller toggles have been found during previous seasons but their size seems to suggest that they were for use on smaller vessels such as chalupas. The large toggle would be used with fairly substantial rigging which would have been found on the San Juan. Other pieces of recovered rigging included a number of pieces of thick cable-laid rope that passed under the bow of the vessel (Figure 3). These pieces originally may have been part of one long rope. Whether this might have been

a mooring cable or part of the standing or running rigging is not known.

Besides the structural and rigging elements other artifacts were abundant from beneath the starboard hull. Common types included ceramic roofing tile fragments, cask parts, leather pieces and rope fragments. Numerous ceramic vessel sherds, mostly maiolica, were also recovered here. An interesting artifact was a bound fibre bundle, possibly a broom or brush. Another organic artifact, a woven mat, found underneath the lower stem piece might have been decorative or protective rope work for the rigging (Figure 4). As metal artifacts are rare from the site, the retrieval of a lead shot was an informative addition to the sparse ordnance data.

#### THE PORT UNDERHULL AREA

Because excavation proceeded more rapidly in the prime areas than expected it was resolved to disassemble the remaining port side structure and excavate below the hull (Figure 5). This decision was prompted by the rich finds below the starboard side. Equally productive results were gained here.

As beneath the starboard hull, a mass of structural timbers was encountered below the port hull. However, due to the more incomplete nature of the port side, fewer timbers were found here compared to the starboard side. The most common identifiable structural pieces included wales, planks and skids or fenders. Numerous unidentifiable parts were also present.

Found partially below the port side, and of significance, was what seems to be the port side fore channel. This piece, a curved wale, was 50 cm longer than the channel found on the starboard but had the same thickness and width. The port channel apparently possessed only two notches, one at either end, as opposed to three on the starboard channel. Although the suspected channel piece was found disassociated from its other component parts, discoveries of vertical supports, heart blocks, triangular supports and chain tend to support the identification of the piece as a channel.

Two metal-banded heart blocks were recovered from near the channel piece. Other rigging elements uncovered nearby included fragments of possible heart block chain in concretion, an osier ring and numerous rope fragments. Further aft, near the midship area, parts of the rigging were much more



abundant. Here, twelve heart blocks, both with iron and rope stropping, were unearthed. The rope-bound hearts proved extremely informative as preserved with them were portions of the stropplings, shrouds and rat lines (Figure 6). These finds are providing the first information on shroud sizes, lashings and knots used.

Also recovered from the midship area were two double-sheaved long tackle blocks (Figure 7). One of these seemed to be intimately associated with the system of shrouds. Both blocks were similar in design and size to other long tackle blocks raised from the site.

As well as rigging elements and structural timbers, the port side under-hull area produced numerous other artifacts. Similar to most areas of the site, roofing tile fragments, coopering debris and rope fragments were abundant. Less abundant but numerous, were leather fragments. Additionally, one complete leather shoe was recovered. Only a few ceramic vessel sherds were found. Individual artifacts included a long wooden tool handle, a small lead pellet and a wooden disk, possibly a gaming piece.

Besides artifacts, two other interesting features were encountered. One of these was a concentration of charcoal. Whether this deposit of burnt wood and ash resulted from some activity or event on board the vessel or was a feature that originated from the shore has yet to be determined. The other feature consisted of an association of fish bone with one of the smaller capacity casks. If the cask parts and fish bone were related this would present the first instance of the storing of foodstuffs in casks on the ship. Establishing this relationship is difficult due to the numerous other fish bones found beneath the hull.

Other faunal remains from beneath this side included the ever-present whale bones and whale bone fragments. Two other mammal bones were also recovered. These are as yet unidentified but were probably food-related.

#### THE PERIPHERAL AREA

Besides excavation on the intact hull structure, a substantial amount of work was carried out around the periphery of the wreck. The purpose of this work was essentially twofold: to uncover important architectural pieces that

had become disarticulated from the intact structure; and to recover artifacts that have been dispersed through disintegration of the ship. The areas excavated included sections on either side of the port and starboard sides from the midship forward, plus a substantial portion forward of the bow structure. Some of these areas partially excavated during previous field seasons were completed this year.

Numerous structural pieces were excavated from the peripheral area. Many of these pieces consisted of broken hull planking and timbers, some of which remain unidentified. Other pieces, however, were identifiable and diagnostic. In this category were a wale and some deck beams, one with three mortices perhaps for stanchions. An important piece was the upper portion of the stem. Although badly abraded, identification could be made based on the curve and traces of the stem rabbet. An intriguing timber was a short curved piece with what appears to be a decorative point at the top of the curve. Presumably, this piece was meant to be seen but its exact position on the ship is not known.

Besides individual timbers, a fairly substantial section of articulated hull structure was uncovered off the port bow (Figure 1). Consisting of broken futtocks and outer hull planking, this section likely formed part of the upper port bow hull.

Rigging elements from the peripheral area were sparse. They included a heart block from the port side and a single sheaved block from the starboard side. The single-sheaved block was unusual in that it was larger than other similar blocks from this site and possessed a long portion of the rope stropping.

Other classes of artifacts proved to be more abundant. While roofing tile fragments, cask parts and rope fragments predominated, ceramic vessel fragments were also plentiful. Some of the latter, it is hoped, will produce complete or nearly complete vessels. Other artifacts included softwood billets, coal fragments and a number of unidentified wooden objects. From forward of the bow came a four-holed wooden button and a fragment of a grindstone, both of which may be intrusive. The grindstone fragment, though, bears a striking resemblance to similar fragments found in a Basque deposit on Saddle Island. Recovered from the starboard side were a section of basketry

as well as another lead shot. The port side produced a large piece of thick leather that may be clothing-related.

Faunal remains proved prolific around the periphery of the wreck. Again, complete whale bones, whale bone fragments and cod fish bone were the most numerous. Two other faunal finds may provide significant information. One of these was a small mandible fragment that might be from a rat, and the other was a mammalian rib, possibly food-related.

An unexpected find off the port side was the remains of another small boat. This boat was badly smashed and incomplete. Recovered pieces included a badly broken two-piece scarfed keel, along with the stem piece and fragments of a similar piece, likely the sternpost. A number of floors, including a few Y-shaped floors, were also found. Planking consisted of the two complete garboards plus several other planks and plank fragments. Parts of the gunwale were also retrieved. A study of the lightly built construction of this boat along with a comparison with the structural features of the small boat found beneath the starboard side, strongly suggest that the port side boat was a chalupa as well. Chalupa were used by the Basque to chase and harpoon whales. This whaleboat interpretation is reinforced by the recovery of a short plank with a semi-circular notch. This may be a clumsy cleat - a short plank mounted in the front of a whaleboat that supported the harpooner's leg.

#### THE HARBOUR SURVEY

This field season saw the continuation of the survey of Red Bay harbour (Figure 8). The harbour survey seeks to locate other submerged traces of the Basque whaling enterprise. A substantial portion of the research time in 1984 was devoted to this aspect of the project.

This year, further excavation was conducted between the stern of the San Juan and the shore of Saddle Island. Excavation has been carried out here to recover material relating to on-shore or near-shore activity. Included here would be remains associated with butchering activity, wharf structures, foodways and habitation. As in the past, the most evident remains from this area continued to be whale bones. Among this mass of whale-bone, flipper elements - including two articulated flippers - and caudal elements predominate.



This tends to support the hypothesis that the tails and flippers of the whales were removed near the shore as an initial step in the flensing operation. Besides these bones, other whale elements included a nearly complete rostrum and a rare whale ear bone.

Other abundant faunal remains included cod fish bone. Uncommon finds were composed of bird bone elements and one polar bear skull. All of these faunal remains would seem to be food-related.

While faunal remains were prolific, artifacts were not lacking from the near-shore area. Common materials were roofing tile fragments, wood chips, billets, cooperage debris, rope and leather fragments. A complete leather shoe, two osier rings and a possible belaying pin or tool handle make up the most interesting of the complete artifacts. Possible construction material included a long billet with fastening holes that may have been part of a wharf.

Further harbour survey research consisted of towed underwater searches around the shore of the inner basin of the harbour. This survey produced virtually nothing relating to the sixteenth-century Basque occupation. An anchor, resting upright on an intact two-piece wooden stock, proved to be a notable discovery. Although only subjected to a cursory examination, it appears not to date to the Basque period.

Towards the end of the 1983 field season, divers discovered another large shipwreck, possibly dating to the sixteenth century (Figure 8). This year, a more intensive survey of the remains was planned. This survey would take the form of selective test excavations of the stern, bow and mast step/pump well areas in order to retrieve definitive artifacts and reveal comparative structural details.

Excavations in the stern have produced significant artifacts and structural information. Most prominent among the artifacts found was likely the astrolabe, an early navigational instrument (Figure 9). Although fragmented, enough of the copper alloy pieces were recovered to reconstruct a good portion of the instrument. Recovered were most of the body, the suspension ring at the top, and a small point that may be off the alidade. No date or degree markings were visible on the astrolabe at the time of recovery. Other artifacts from the stern included a number of small calibre cannonballs, lead

shot, rope fragments and a great many ceramic vessel sherds. The ceramic pieces are very similar to these from the San Juan site.

Structurally, the stern of this vessel is almost identical to that on the suspected San Juan site. Both have the L-shaped stern piece which is scarfed to the stern post and the keel. These two scarf joints are reinforced by an overlapping stern knee that lodges inside the keel and stempost. The arrangement of the Y-shaped floors and first futtocks is also similar to that found on the San Juan. In the midship area, brief excavations exposed the main mast step along with the pump well features. The mast step was of similar construction and size to the one on the San Juan, but the pump well, on the other hand, had structural details that were dissimilar. Here, the well was more sturdily constructed having thicker planking and heavier corner posts. Also, unlike the San Juan, this ship possessed two sumps (one on either side of the keelson) rather than one. The two sumps were neatly made as opposed to the rudely cut one on the San Juan. A portion of the stem was excavated and briefly examined indicating a similar construction to the San Juan.

The short survey of this new wreck has revealed a large ship of a similar size to the San Juan. The structural details and recovered artifacts seem to point to a sixteenth-century date. From the excavations and surface examinations of other areas of the site no remains of a cargo of whale oil casks were evident. There were some indications that this ship may have been at least partially burnt.

This year, while an area of Red Bay harbour was being surveyed prior to the installation of a sewer outfall, the remains of a third large vessel were encountered (Figure 8). As only a cursory examination of this new wreck was carried out, little information is available. It appears to be approximately the same size as the other two large vessels. The ceramics that were seen were similar to those on the other two vessels, arguing for a sixteenth-century date. Structurally, only the main mast step was studied carefully. This was similar in size and construction to the other two. It is hoped that a more intensive reconnaissance can be conducted on this wreck to help clarify the structural, artifactual and historical issues raised by this vessel.

Work continued this year on the small vessel found near Penny Island

(Figure 8). This vessel has provisionally been identified as a pinaza, a small two-masted Basque sailing vessel used in the whale industry. Discovered originally in 1980, it was more thoroughly investigated in 1983, and then totally excavated and disassembled during this field season.

When first investigated the wreck site appeared confusing until it was noticed that the vessel was upside-down. Excavation revealed a vessel approximately 10.5 m long with a beam of around 2 m. The recovery of both the stem and stern posts indicate a double-ended boat. Steering was likely accomplished with a steering oar as no rudder or rudder attachments were found. This boat was not as finely built as the whale-boat, or chalupa, and was of a heavier construction. In some cases examples of crude construction were evident. For example, the gunwales were simply made by splitting a small-diameter tree in half, stripping off the branches and nailing it in place. It may have been similar to the chalupa in one respect. Some evidence exists to indicate that this vessel was carvel-built in the lower portion and clinker-built for the upper part. A fore mast step was recovered at the bow along with a cross-beam for the main mast, indicating propulsion by sail, although there were some indications along the gunwales that oars were used as well. The overall appearance of the wreck suggests a utilitarian vessel of some sort. The recovered timbers will be studied more completely.

#### STRUCTURAL RECORDING AND MODELLING PROGRAM

A major aspect of the project at Red Bay has been the raising to the surface of the structural elements of the suspected San Juan, and the subsequent recording of the individual parts. Following the raising, significant pieces were carefully drawn at a 1:10 scale. The purpose of this recording procedure was twofold: first, to produce a permanent and accurate record of all important structural pieces; and second, to provide the raw data for a scale model of the ship. The modelling program was instituted as it was not planned to either raise the ship as a whole or reassemble the individual pieces.

In actuality there will be two models. One of these will be a 1:25 scale as-found site model. This will show a few excavated trenches with the

in situ timbers, timbers found on the sea-bed surface and the sea-bottom topography. The other model, and probably the more important of the two, is a 1:10 scale reconstruction of the ship. A total reconstruction will not be attempted. Rather, enough will be done including most of the starboard side and stern, the lines of the vessel, to illustrate important structural details, and to see how significant assemblages of pieces fit together (e.g. the transom) (Figure 10). The modelling program will principally be a learning process for the archaeologists on sixteenth-century Spanish naval architecture, and an instructional device for associated researchers and seasonal diving staff.

Substantial progress has been made on the ship model, under construction intermittently for two years. The stem, keel and sternpost have all been assembled. In addition, the transom assembly has been produced and mounted. The overall length of the reconstructed vessel is now reasonably well defined. Some of the framing has been also completed. This includes the Y-shaped floors at the bow and stern as well as some of the other floors, along with some of the first and second futtocks. With these in place the lines of the hull are starting to become apparent.

Major contributions to the model this field season came from the recovery of the master frame and the keel. The master frame, consisting of a floor timber and a complete set of futtocks attached to either face, was normally the first frame erected near the center of a ship. The other frames were set up going forward or aft from the master frame. The master frame generally defines the widest part of the ship.

Another significant piece recorded this year was the keel. The keel was a massive piece of beech 14.3 m long, 58 cm wide and 45 cm deep (Figure 11). More remarkable than its size, however, was its shape. At the middle the keel was roughly T-shaped in cross-section. The projections were shaped more and more upwards towards the bow and stern so that the keel was U-shaped at either end. The ends appear to have been manufactured much in the way a dug-out canoe might have been made. In effect the projections formed the garboard strakes on either side of the keel.

FUTURE WORK

As this field season was the last one involving major excavation at Red Bay, future plans will be mainly directed towards the close-down of the site. The major task here will be the permanent reburial of all of the excavated timbers. Intertwined with this will be the completion of the drafting of the ship's significant timbers. Also planned is some further survey work on the other two large shipwrecks. Underway now is a dendrochronological study attempting to date timbers from the large ships as well as from the smaller boats.

The finalization of field work will lead into the next stage of the research process - the synthesis of the collected data. Included here will be detailed artifact analyses, artifact distribution studies, stratigraphy studies and the analysis of the ship's architecture. The completion of this phase of the project should provide a sound knowledge of sixteenth-century Basque whaling technology, naval architecture, and daily life in a Labrador whaling station.



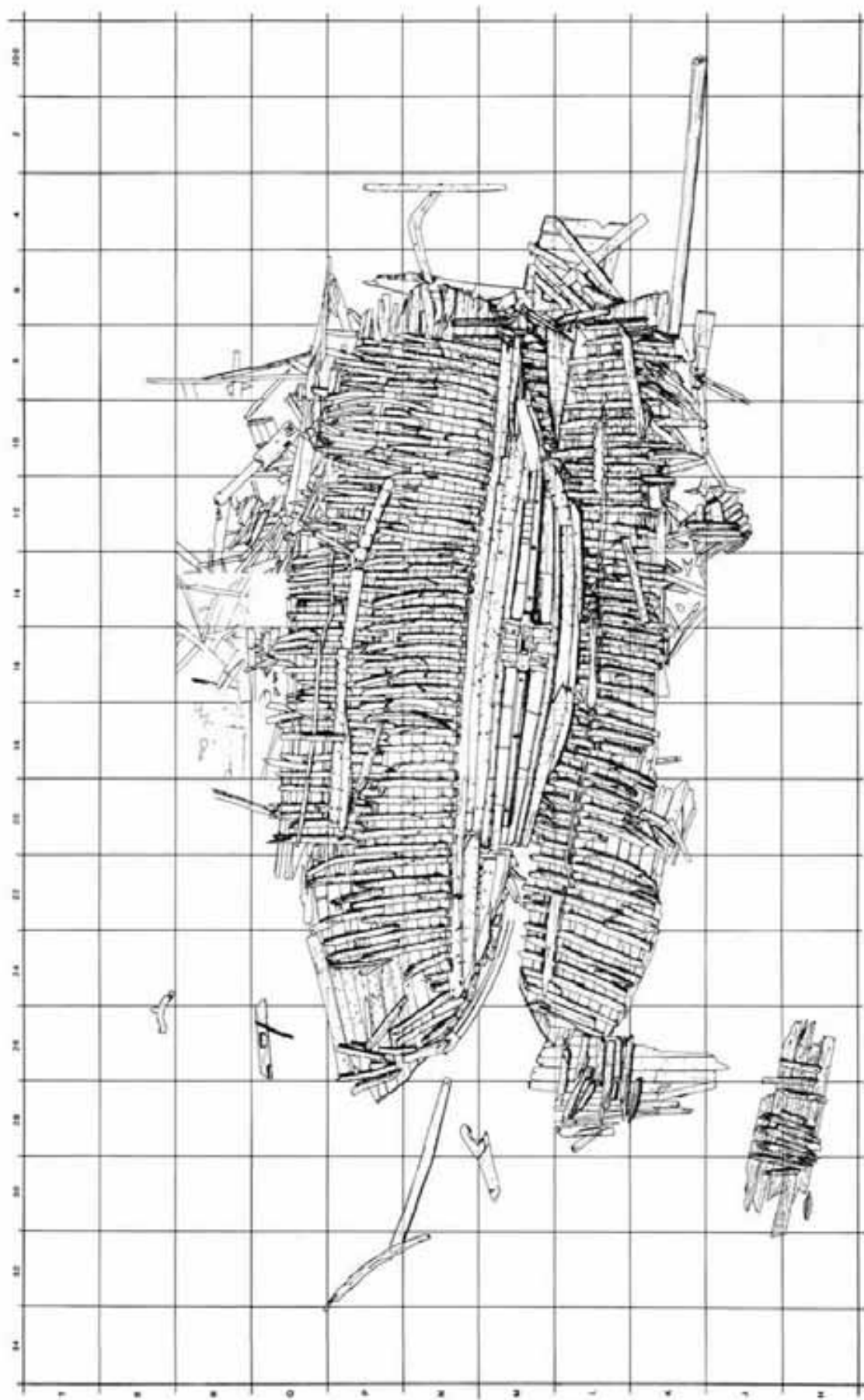
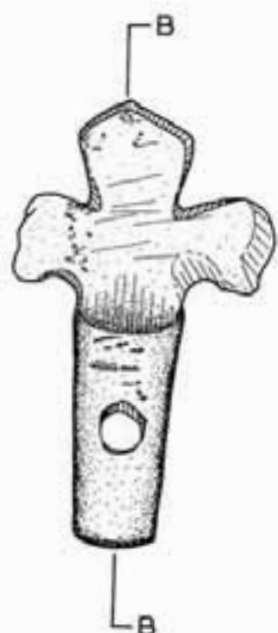
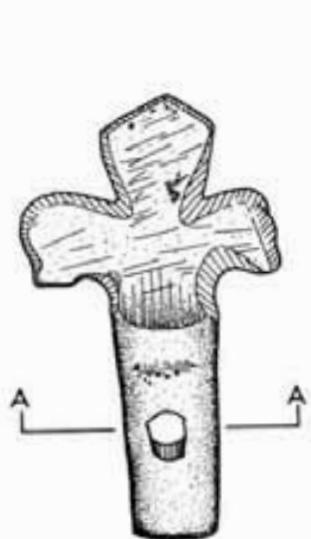


Figure 1

Complete structural plan of the sixteenth-century Basque galleon. (Drawn by:  
J. Farley).

Figure 2

Copper-alloy spigot key. (Drawn by: J. Farley).



SECTION B B

24M18L10-1

14-12-84

J.C. FARLEY

5 cm

FIGURE 3

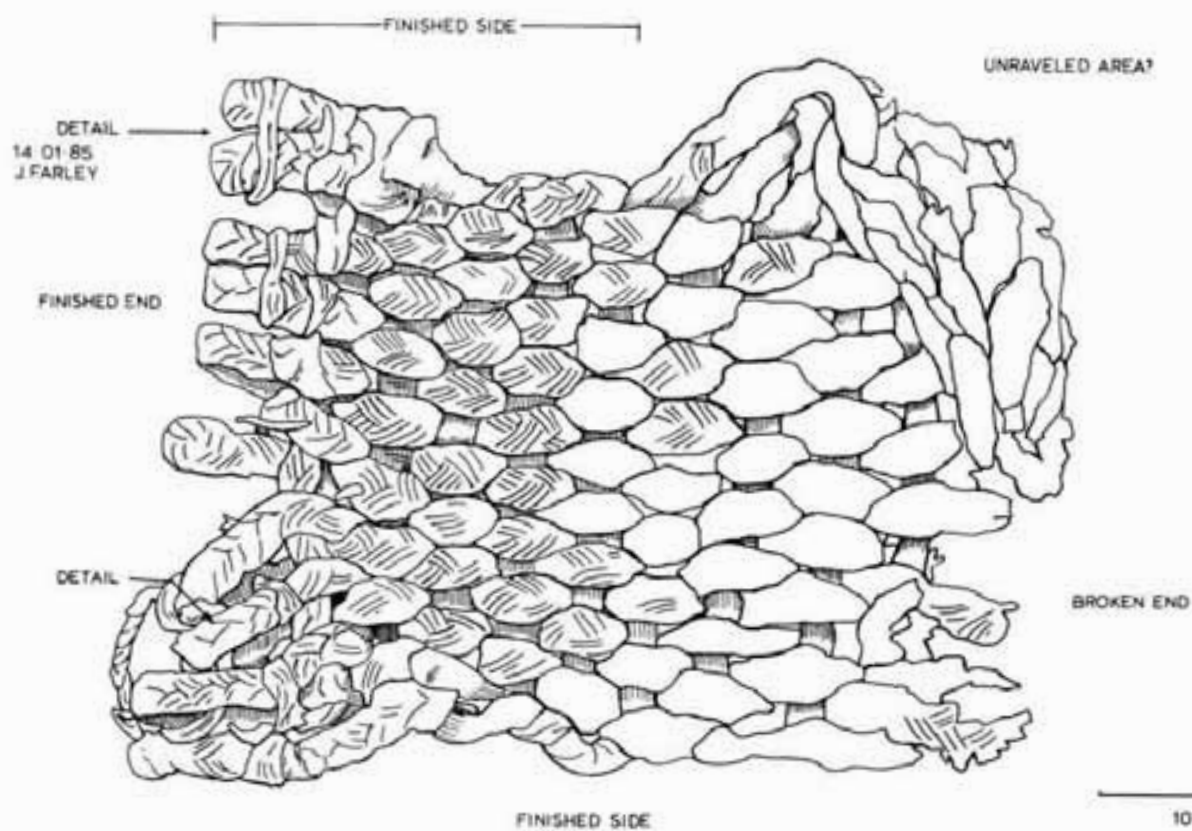
Large diameter rope and a single-sheaved block found beneath the bow of the ship. (Photo by: D. Page).





Figure 4

Woven rope mat. (Drawn by: C. Piper).



24M24N9-1  
14-02-85  
Gordon P. Jones

Figure 5

Excavator disassembling a floor timber from the hull. (Photo by: D. Page).



Figure 6

Heart block with an attached portion of the rope shroud. (Drawn by: C. Piper)





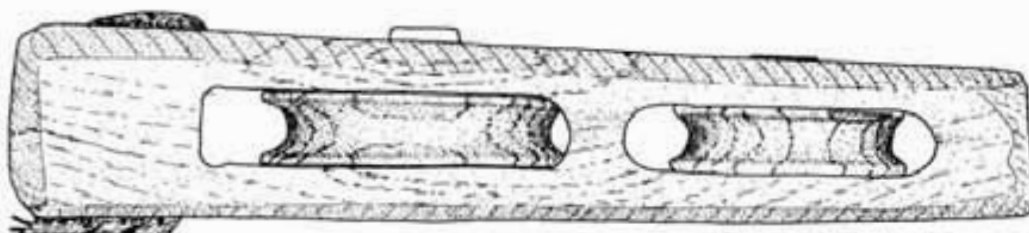
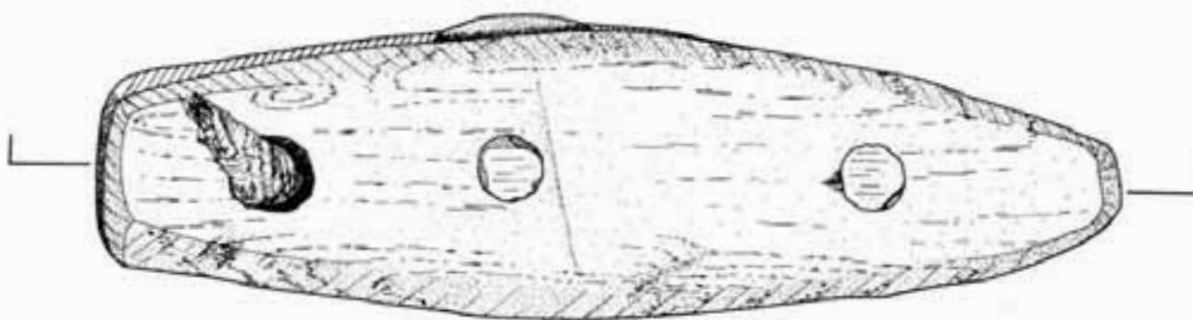
10 cm

2001/05-1  
M. O. B.  
C. D. H.



Figure 7

Double-sheaved long tackle block. (Drawn by: J. Farley).



10 cm

24M18K10-1

04-01-85

J.C. FARLEY



Figure 8

Plan of Red Bay showing areas surveyed and the locations of major underwater features. (Drawn by: C. Piper).

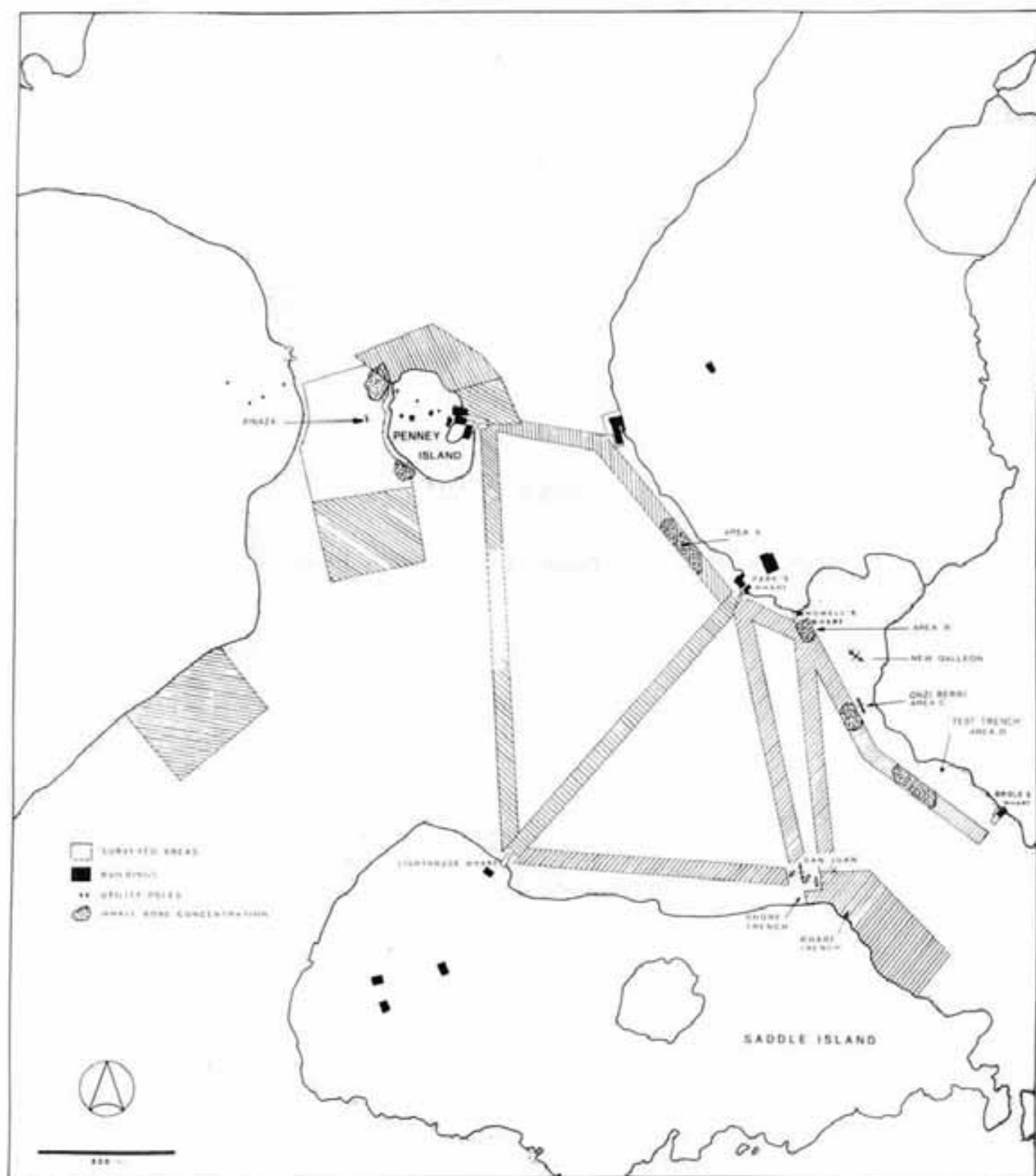


Figure 9

Drawing of the astrolabe. (Drawn by: C. Piper).

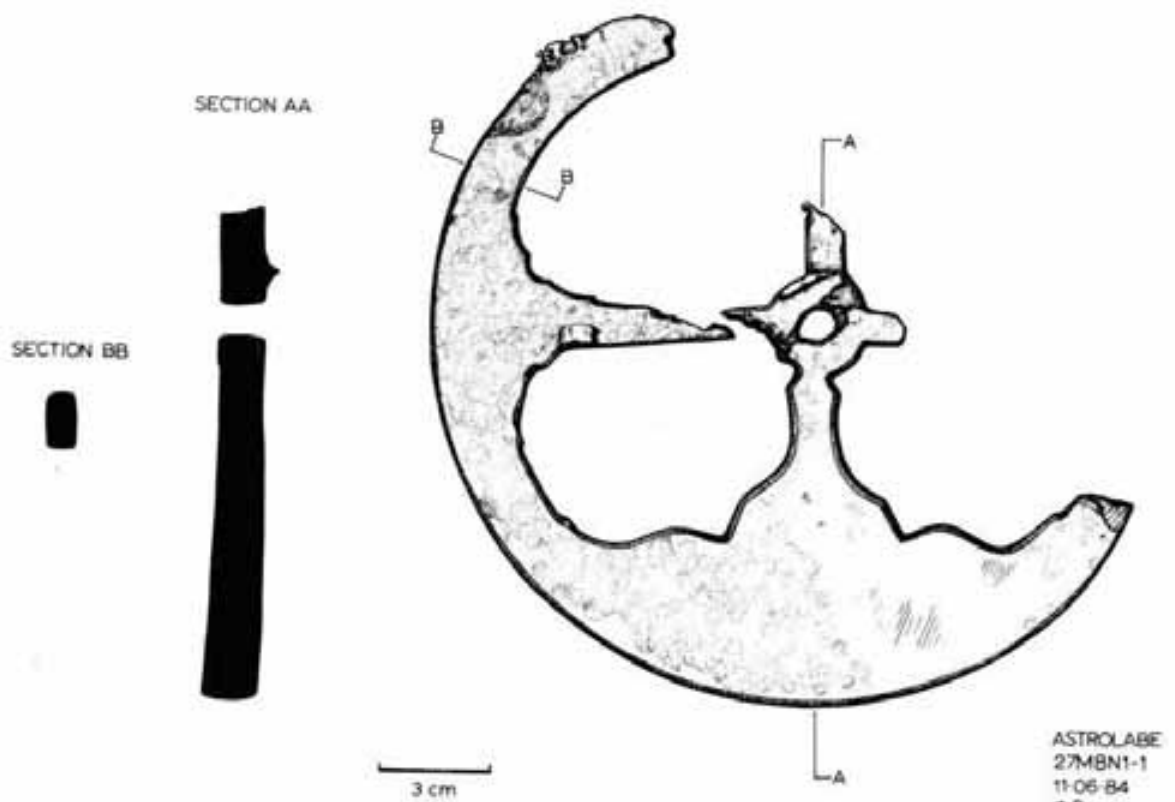




Figure 10

Modelled reconstruction of the stern and transom. (Photo by: D. Page).

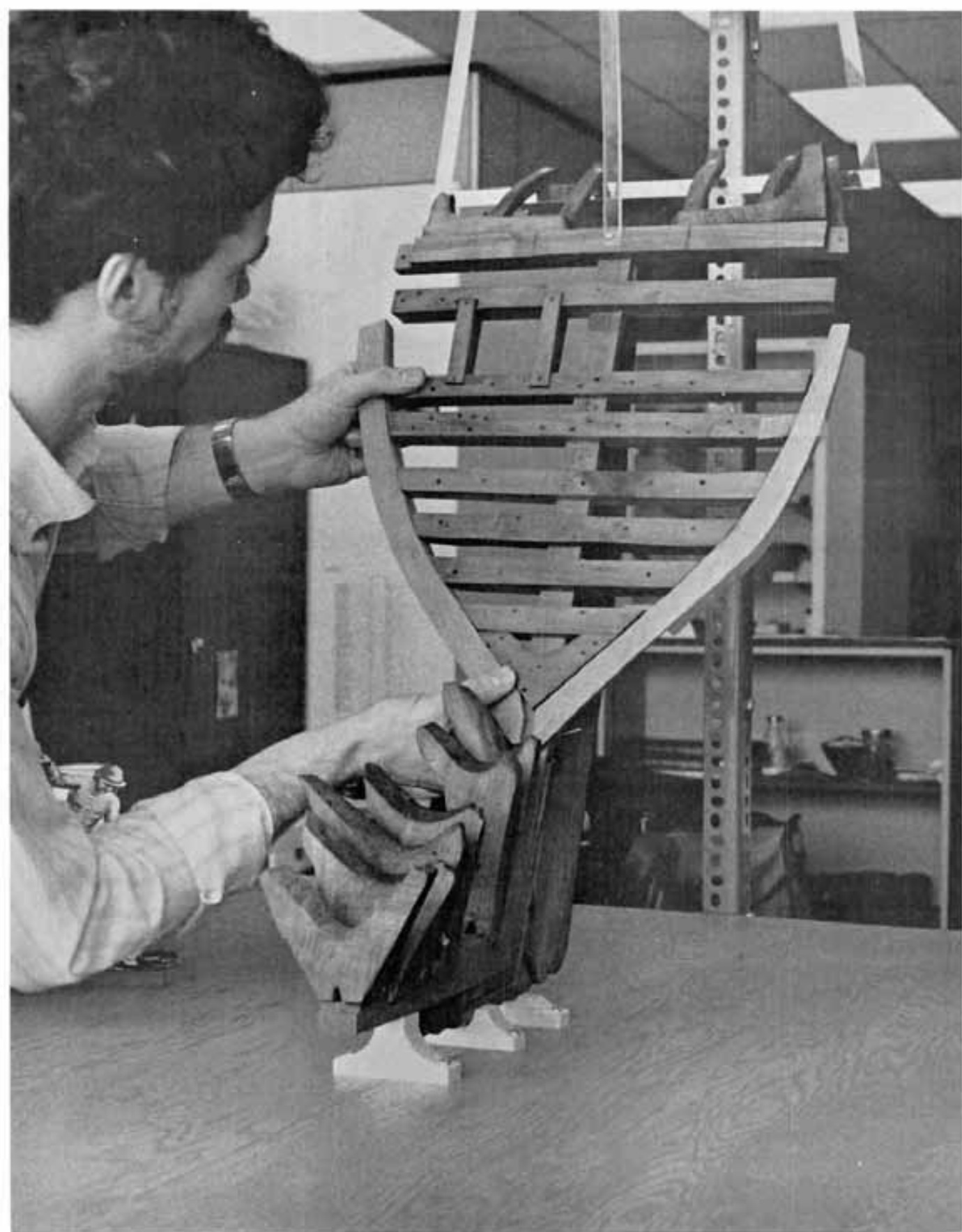


Figure 11

Drawing of the keel. (Drawing by: C. Piper).

