

**MARINE ARCHAEOLOGICAL RESEARCH AT RED BAY, LABRADOR:
A SUMMARY OF THE 1985 FIELD SEASON**

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INTRODUCTION

In 1985 the Marine Archaeology Unit of Environment Canada - Parks completed its final season of field work in Red Bay, Labrador. The Red Bay Project, begun in 1978 under the direction of Robert Grenier, was centred around the excavation of a Basque whaling galleon. This vessel, thought to be the San Juan, was documented to have sunk in 1565 (Barkham and Grenier 1979:61). Excavations were also carried out on Saddle Island, the site of many of the Basque try-works. These excavations are being conducted by Dr. James Tuck from Memorial University of Newfoundland.

The importance of Red Bay as a whaling port was, at first, only partially understood. However, as historical and archaeological research continued, it became apparent that Red Bay played a major role in the Basques' New World whaling ventures. It is now estimated that as many as eight to ten whaling galleons may have been in the harbour at any one time. The archaeological investigations have identified three possible sixteenth-century galleons and four small boats, three of which were directly related to the Basque whaling fishery. Other evidence of the Basque presence has been found throughout the harbour, primarily during test excavations in underwater areas exhibiting surface concentrations of Basque material culture. These excavations have provided information on whale butchering techniques, carcass disposal patterns, a contemporaneous cod fishery, a cooperage operation, building construction, and a number of wharf structures.

The objectives of the 1985 field season focussed on the reburial of ship's timbers and on the permanent closing of field operations at Red Bay. However the discovery of two other possible sixteenth-century galleons in previous years, necessitated limited recording of important comparative features on these ships. Such features included the pump well/mast step areas, the sterns, master frames, and overall dimensional characteristics.

The harbour survey was also completed. This included testing an area along the proposed path of a sewage outfall pipe, towed searches within the harbour, and the investigation of a possible Basque wharf.

TIMBER REBURIAL

By 1985 the wreck of the San Juan had been completely disassembled. Over 2500 timbers had been raised to the surface, recorded and placed in temporary underwater reburial pits. Thus, the major task of the 1985 field season was to rebury permanently the entire complement of ship's timbers. Systematic reburial of such a large number of timbers had never been attempted. Conservation Division, Environment Canada - Parks was asked to develop guidelines for this work. After literature searches, several consultation meetings and some experimentation, a reburial plan was formulated (L. Murdock and J. Stewart, 1985). The essence of the plan was cost-effectively to create a sealed and anaerobic environment in which to store the timbers. This reburial attempted to duplicate the pre-excavation environment of the wreck timbers in terms of light, temperature and gas exposure.

An estimate of the timber volume was done in order to determine the space requirements of the reburial area. It was calculated that an area 14 m by 16 m by 1 m high would be required. This permitted the stacking of timbers in three distinct layers with 20 cm of sand above each layer. The profile of the reburial area was kept as low as possible in order to minimize any iceberg contact, which is unavoidable in the area. The seabed depression created by excavation of the San Juan was the obvious area to locate the pit, thereby reducing overall profile and avoiding disturbance of the surrounding artifact-bearing unexcavated seabed.

To contain the timbers and sand, a sandbag dyke was built using approximately 1200 plastic salt bags, containing some 36 metric tonnes of sand (Figure 1). The dyke walls were built in stages to permit their support by timbers and sand on the inside and by rock fill on the outside. Emphasis was on the use of readily available materials (rock, sand, salt bags) to create a stable tapered wall. In addition, it was felt that a tapered rock wall was essential in minimizing disturbance by scouring icebergs which could severely damage any vertical sandbag wall.

The area of the wreck slopes slightly downward from south-west to north-east. The deeper portion of the pit, the northern side, was used for larger timbers which passed through more than a single reburial layer. This included the 14-metre keel, keelson and several other great and compass timbers. Generally, the timbers were buried in three distinct layers. The first layer was laid within the dyke on sterile, previously excavated seabed. Timbers were fitted or "nested" to maximize the total wood volume in each layer (Figure 2). Upon completion of a layer, the area was mapped to show the location of each timber. Following the verification of the layer map, the sand covering operation began. Sand was lowered into position over the site in a specially designed dump bucket, carrying approximately two metric tonnes of sand (Figure 3). This was manoeuvred into position and released into the reburial pit. Gaps between timbers were filled and then 20 cm of sand was used to cover the entire level. The following two timber layers were built up in a similar fashion producing an overall height of approximately one metre. Ninety-six metric tonnes of sand were put over the first timber layer, followed by 93 metric tonnes for the second layer and 126 metric tonnes for the final layer, totalling 315 metric tonnes.

The reburial pit required a covering to prevent erosion of the sand and to minimize gas transfer. The covering used was a 36-mil hypalon tarp, which is a synthetic elastomer rubber with a reinforcing weave. The cover was made in two pieces to simplify handling, which was laced together underwater (Figures 1 and 4). The 16-m-by-18-m dimensions permitted coverage outside the walls of the reburial pit by one metre on each side. To ballast the cover, 60 concrete filled tires, totalling nine metric tonnes, were dispersed over the surface.

Reburial of the timbers at Red Bay represented the largest undertaking of its kind in maintaining shipwreck timbers in an optimum state. To help determine the effectiveness of the methodology, a testing procedure has been established incorporating wood samples placed at three different depth levels through the reburial site. The samples were strung on ropes which can be pulled from the pit without disturbing the other timbers (Figure 1). Over time these timbers can be recovered for comparison with frozen control wood samples from which they were cut. Some timbers were reburied outside the

reburial pit and these could also be used in assessing the effectiveness of the reburial methodology. Results of these testing procedures will have application to other underwater excavations, many of which are faced with similar reburial considerations.

OTHER WRECK SITES IN THE HARBOUR

In addition to the San Juan (24M), two other large ships have been found on the bottom of Red Bay harbour. One was discovered in 1983 and the other in 1984. The first of these wrecks (27M) was partially examined in 1984 through test excavations in the stern, bow, and mast step/pump well areas (Ringer 1985:190). The second wreck (29M) was also investigated in 1984, however, only a cursory examination was possible. It was not until 1985 that further work on both sites enabled the recording of principle features.

27M

This wreck was discovered during the survey of selected areas within Red Bay harbour. Preliminary testing uncovered the stern, the midship, and bow areas. It was identified as a probable Basque ship based on a number of comparative features, e.g. mast step, triangular recesses and master frame construction. The wreck, located in approximately five metres of water, was first noticed because the ends of the floor timbers were sticking out of the bottom silt. In 1985, excavation using water dredges was carried out in the stern and midship areas.

STERN

The excavation in the stern area was designed to uncover evidence on stern construction, principally the assembly of the stern post, stern post knee, and ship's heel. Excavation was carried out along the side of the stern hull down to the bottom of the keel; however, due to the presence of the exterior planking, little could be seen of the actual assembly technique. Stratigraphically, there was little difference between the stern areas of 27M and 24M. Cultural deposits average 40 to 45 cm thick, including barnacle shells, and were overlying a natural layer of grey sand. Most of the artifacts collected were found within the grey sand and included leather

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fragments, a piece of rope, pieces of lead, a cannonball fragment, two unidentified mammal bones, and one-half of a small pulley sheave.

Midship

Previous excavation in the midship area uncovered the mast step and a portion of the pump well. Further excavation in 1985 completed the recording on the pump well and its associated sumps.

The pump well, located aft of the main mast step, measured 140 cm by 80 cm. It was heavily constructed using 6-cm thick, hardwood planks, supported by four corner posts morticed into the ceiling planking. In comparison, the pump well on 24M was built using 2.4-cm thick, softwood planks. Construction was carefully carried out with planks cut to insure proper fittings over the keelson, mast step cheeks, and ceiling. The sumps consisted of two square holes cut through the limber boards. There was no sign of the pump mechanism.

The interior of the well was filled with a large amount of tightly packed rock, most of which seemed to be ballast rock. There were, however, a variety of interesting artifacts found scattered throughout the rock fill. Of particular interest was the remains of an interwoven, reed-like material and two, obviously worked, branch-like sticks. This assemblage appeared to be a type of basket. The same area also yielded numerous walnut shells, other unidentified nut shells, a small knife handle, and very well-preserved leaves from a plant identified as "Butcher's Broom" (*Ruscus aculeatus* Liaceae). This particular plant is actually an evergreen shrub native to Mediterranean and central European regions. It can be used medicinally as a diaphoretic (ed. note: producing perspiration), deobstruent and aperient (ed. note: laxative).

Discussion -27M

Several of the ceramic sherds collected from 27M, particularly in the pump well, showed signs of having been burnt. Several glass sherds actually appeared to have melted. Although there were no obvious signs of burning on the timbers, it is likely that parts of the ship may have burned.

Dendrochronology studies are being carried out on some of the larger timbers, and it is hoped a chronology can be established in relation to the other wrecks and to the Basque occupation. Finally, the wreck was backfilled

with sandbags and covered with seven metric tonnes of loose sand.

29M

This wreck was discovered in 1984 while conducting test excavations along the proposed route for a sewage outfall pipe. As a result of the discovery a new route was recommended and the outfall pipe was installed in 1985 (Figure 5).

The wreck, a large wooden vessel similar to 24M and 27M, was located in approximately three metres of water. Many of the ship's timbers, mostly knees and beams, were lying exposed on the harbour bottom. There was, however, no definitive alignment to the timbers and test excavations were carried out in 1984 to establish the vessel's orientation. By hand fanning it was possible to locate the mast step and portions of the bow. These parts of the ship, although covered with only a thin layer of silt, were very well preserved. In 1985 further test excavations using a water dredge examined more closely the stern, midship and bow areas.

Stern

Excavations in the stern area revealed a large portion of the structure still intact. The ship was lying on its starboard side, leaving the port side uppermost and more accessible for recording. A series of four strakes were still firmly attached to the heel/sternpost assembly. The heel had a very short upper-arm, with a length of approximately 25 cm. It was scarphed to the bottom of the stern post utilizing a curved or hook-shaped design.

Stratigraphically, there was one large deposit of silt covering the hull. The depth of this deposit was approximately 80 cm. Below this layer and extending beneath the keel was a 2-cm layer of crushed barnacle shells, followed by sterile grey sand. The absence of any quantity of barnacles, as was found on 24M, would indicate that the ship broke up or was dismantled soon after it sank, limiting the amount of structure available for barnacle attachment.

A general observation on the orientation of the stern section is that it appeared to be angling upwards towards the bow. This may indicate that the heel to keel scarph has been broken and that the stern has separated from the

rest of the hull. This possibility was further reinforced when a second test pit was excavated at the aft end of the keelson. At this point no structural remains (floors or futtocks) were found overlying the keel, suggesting extensive damage to that part of the vessel. Further, the line of the keel at this point was parallel to the harbour bottom and not aligned with the stern heel. In effect, it appears that the ship "broke its back" somewhere near the junction of the heel and keel.

Midship

Excavation in the midship area uncovered the mast step, pump well, a section of ceiling planking and footwale, and the ends of the master frames (Figure 6).

The mast step was similar to that found on 27M. It was apparent that a considerable amount of time and effort had been put into the construction of the surrounding support elements. The wedge-shaped cheeks had all been grooved on their upper side edge to facilitate a better seal with the boards between the cheeks.

The pump well was located immediately aft of the mast step. No planking or corner posts were found, making it impossible to establish the precise dimensions of the well. Other features of the pump well include two sump holes cut on either side of the keelson. Both are circular and were cut so as to avoid the floor timbers.

Four billets were recovered from around the mast step which are likely to have been used as dunnage. The billets were either half or quarter round, found in pairs, aligned parallel, and separated by the estimated width of a cask. They are presently undergoing examination for possible use in a dendrochronology study of local wood sources. This study is being undertaken by researchers at Laval University in Quebec City and could lead to the precise dating of the sinking of this vessel.

Bow

The bow area was initially uncovered in 1984 during testing along the proposed route of a sewage outfall pipe. This testing revealed a large intact section of the bow, consisting of a series of exterior strakes, two wales and

a possible clamp - a heavy interior timber running in a fore and aft direction, indicative of a deck level. The presence of wales suggested a section of hull fairly high up above the water line in the bow structure. This particular section has not been found intact on the other Red Bay wrecks. Excavation in the bow was limited to uncovering the forward end of the keelson and the keel at that point.

Discussion - 29M

The keelson, one of the more important timbers recorded, had an overall length of 12.31 metres with a mast step off-centred towards the stern. A test pit excavated at the forward end of the keelson revealed a considerable amount of structural damage, including missing floor timbers. The top of the keel at this point was also uncovered. The keel was completely broken off approximately one metre forward of the keelson. The extent and type of damage suggested that, although a large portion of the bow structure was intact, it may not be integral with the rest of the hull.

A very limited number of artifacts (20), including faunal remains, were collected from 29M. The absence of artifacts and the lack of barnacle shells may be indicative of an extensive salvage operation by the Basques. It is not inconceivable that the ship, which grounded in relatively shallow water, was completely salvaged of any useable materials, including timbers.

Prior to reburying the wreck, several samples of the ship's structure were taken for dendrochronology studies. These will be included with samples taken from the other two wreck sites in the hope of establishing a dateable chronology. At the end of the 1985 field season the test pits on 29M were filled with sandbags and the entire site covered with nine metric tonnes of loose sand.

HARBOUR SURVEY

Testing the Proposed Route of a Sewer Outfall Pipe

A major portion of the 1985 harbour survey involved the excavation of a number of test pits along the proposed route of a sewer outfall pipe. The testing was a continuation of the survey work started in 1984.

The installation of the outfall pipe was designed to be laid on top of the harbour bottom. To secure the pipe, it was covered with several metric tonnes of rock up to a point where water depth prevented any further placement. After this point the pipe was anchored to the bottom using prefabricated concrete collars. Thus the pipe was exposed for a distance of approximately 60 metres. It was this portion of the pipe line route which was tested in 1985.

Fourteen 2-m-by-4m test pits was excavated along the 60 metre line. Spacings between test pits were two m and five m depending on location and test findings. Of the 14 pits excavated six revealed evidence of whaling activity. Four of these related to a concentration of whale bones, while the remaining two represented individual whale bone finds. No other materials were found indicative of the Basque presence.

Towed Searches

Additional survey within the harbour included a series of towed searches. These searches utilized an outrigger towing method that enabled two divers to visually search an area approximately 25 metres wide. All tows were timed, with individual finds located according to elapsed time.

Three towed searches were conducted in different areas of the harbour. The first search, along the northeast perimeter of the basin, revealed a number of isolated whale bones. Near the end of the search, a concentration of whale bone was found that turned out to be the remains of a nearly complete bowhead whale. This semi-articulated carcass was completely excavated and recovered for faunal analysis. Preliminary indications are that it is a small, immature bowhead without the tail or flipper elements. These missing elements coincide with the theory that flipper and tail elements were being disarticulated prior to flensing. This discovery marks the first time that a nearly complete carcass, including skull, has been found. It will no doubt help to further understand carcass butchering techniques and disposal patterns.

The second towed search began at the research barge and continued on a straight line course to the Penney Island stage. Only one whale bone, a maxilla fragment, was noted. However, because of depth restrictions, visual con-

tact was lost with the bottom when the divers crossed the harbour channel.

The third towed search was conducted along the innermost part of the basin. Visibility was at times quite limited, less than one metre, because of the fresh water influence from out-flowing brooks. Water depth averaged four to five metres throughout the search area; although the bottom dropped off rather abruptly to +15 metres in some places. These sections were not surveyed because of depth restrictions. No Basque-related materials were seen during the search.

Wharf Structures

During a previous field season at Red Bay a possible Basque wharf was partially excavated (Ringer 1982:84). It was located just offshore from a Basque try-works on Saddle Island. This particular try-works was excavated by Dr. James Tuck of Memorial University of Newfoundland in 1980 (Tuck 1981:56). In 1985 additional excavation was carried out on the wharf in an attempt to confirm a Basque origin.

Because of a large overburden of tightly packed rock, excavation of the entire structure was not possible. The excavated remains appeared to represent the bottom of a crib-like structure. It consisted of two parallel logs with an attached cross piece. The actual bottom or floor of the crib was made up of five smaller, evenly spaced logs within the framework. Construction details included a mortice cut into the upper surface of both parallel logs. These mortices were likely used to support a weight bearing vertical timber. Auger holes, apparent in the corners of the mortices, seem to have served as guides during the actual cutting out. More importantly, oak barrel stave fragments were found pressed against the inside of both mortices. These fragments represent wedges which had been driven into each mortice to secure firmly the tenon of the vertical post.

While an exact interpretation on the function of this structure cannot be made, its close proximity to the tryworks and its construction details indicate a Basque wharf, possibly a cutting-in stage.

SUMMARY

The Red Bay Project, in regards to the underwater research, has now been completed. Major emphases in 1985 were placed on site reburial and overall close down.

The Project, which encompassed eight field seasons, has yielded a great deal of unique information on Basque maritime history in Eastern Canada. The discoveries at Red Bay have not gone unnoticed and the harbour is now recognized as a significant and valuable repository of sixteenth-century shipbuilding tradition and Basque maritime culture.

The results of these many years of underwater research have been published world-wide in a vareity of books, journals, bulletins, and newspapers as well as being presented in over 60 papers at international and national symposia throughout Europe and North America. The Project was also very well documented by the production of a 57-minute film entitled, "The Basque Whalers of Labrador". The film was produced by Adlanut Productions and is available for rental through the producing company. Detailed archaeological reports have been compiled on a yearly basis and are being prepared for publication. Research on the Basques of Labrador is continuing and additional publications are planned in the near future.

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Figure 1

Timber reburial pit. (Drawing by N. Hart)

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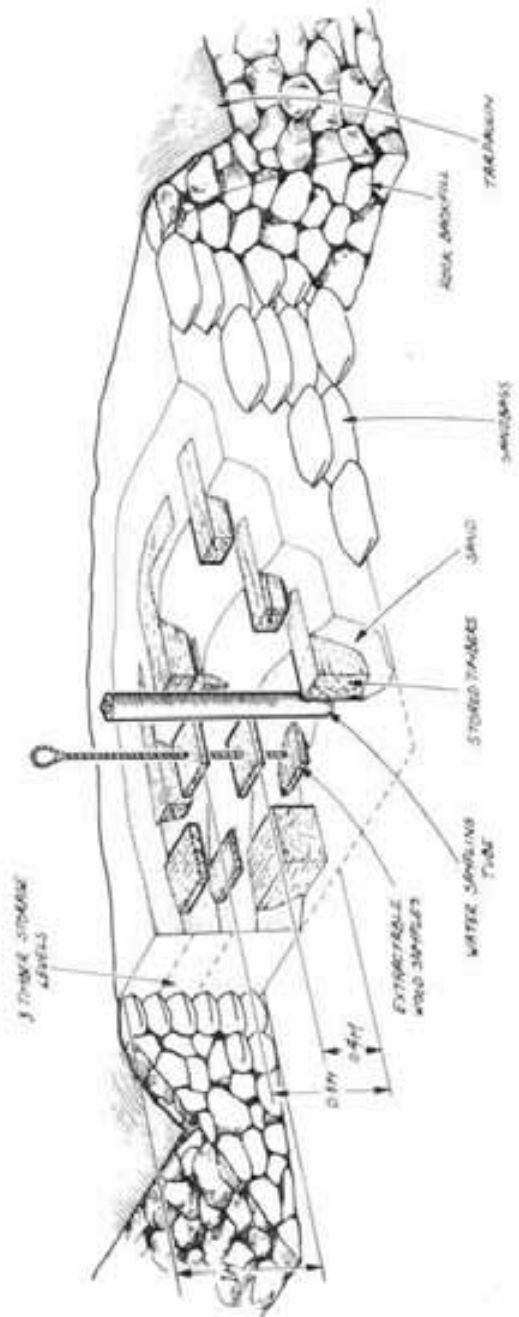
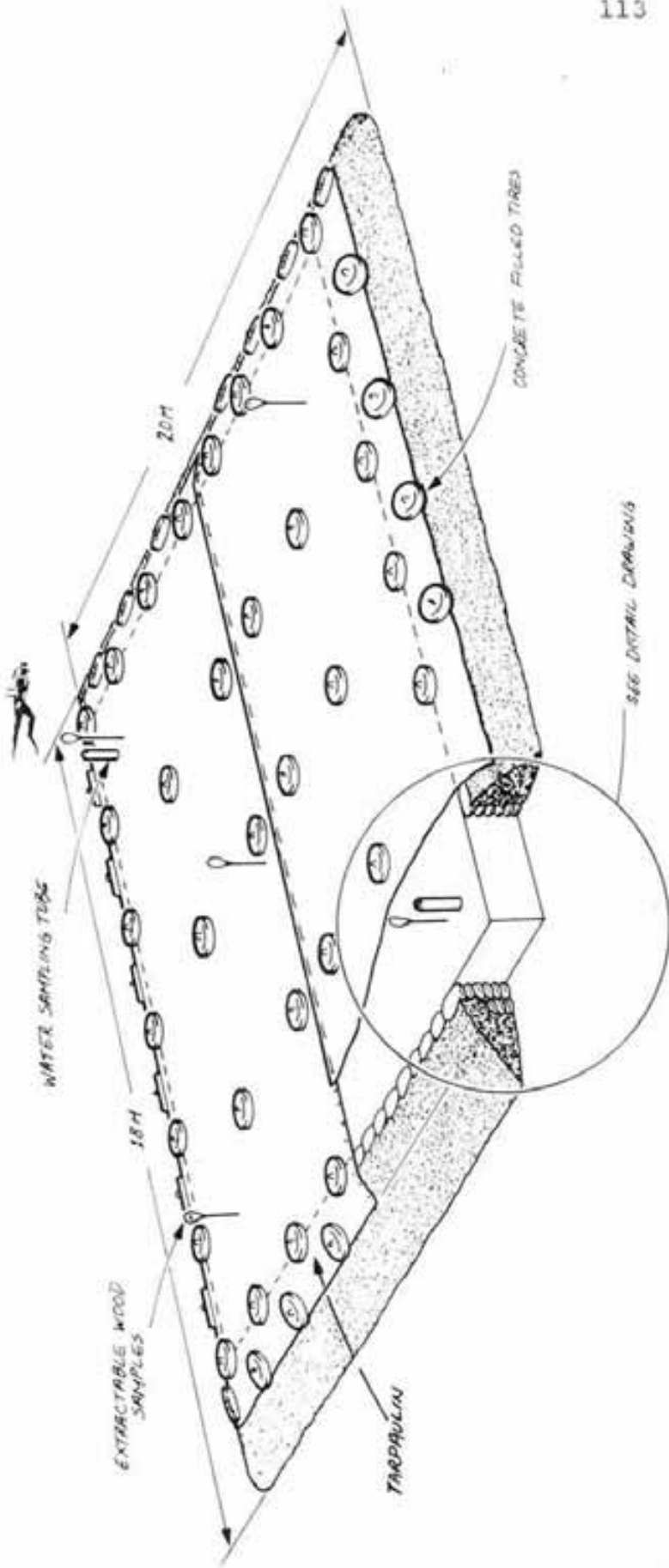


Figure 2

Timbers fitted into northern half of reburial layer 3.
(Photo by D. Page)

Figure 3

Sand being dumped onto reburial pit. (Photo by
P. Waddell)





Figure 4

Trial joining of reburial tarp on surface.
(Photo by R. Chan)





Figure 5

Red Bay harbour showing the location of the sewer outfall pipe (line of rock) in relation to the 29M wreck site (floating dock). (Photo by D. Page)



FIGURE 6

Mast step of 29M.
(photo by D. Page)



FIGURE 7

Carcass remains of a bowhead whale. Note skull in foreground.
(Photo by D. Page)