CONSERVATION IN THE FIELD: AN EXAMPLE FROM RED BAY

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Archaeologists have the responsibility to ensure that excavated artifacts will survive for study and for display. The survival of archaeological material depends on good excavation technique, proper post-excavation storage, and ultimately, some type of conservation treatment to enable the material to be stable at ambient conditions. This paper describes the operation of a field laboratory that has been established by the Canadian Conservation Institute (CCI), in conjunction with the Province of Newfoundland and Labrador and the Memorial University of Newfoundland to support the excavation of a 16th century Basque whaling station at Red Bay, Labrador.

By discussing the role a field lab fills as well as describing equipment, techniques and personnel that have been employed in the running of this particular lab, it is hoped that this will serve as a guide to archaeologists involved in the excavation of complex sites.

BACKGROUND

Since 1978, Dr. James A. Tuck of Memorial University has been excavating the 16th century Basque whaling station located at Red Bay (Tuck 1982, 1983). The CCI became involved with the excavation when Tuck requested conservation assistance during his first season of excavation (Senior 1980).

Artifacts found on the site range from Palaeo-Eskimo lithics to debris associated with the 19th century settlement of Red Bay. The bulk of the material is related to the 16th century exploitation of the area by Basque whalers and includes almost every type of material that was available to European technology at that time: glass, ceramics, a variety of metals, textiles, leather, and wood, as well as substances that are by-products of the whaling industry, such as baleen (Tuck and Grenier 1981).

As an historical resource, the site is unique in North America, representing a European activity that had not previously been investigated: that of establishing industrial centres for the purpose of exploiting a specific resource. The artifacts which reflect this activity form a type collection which must be conserved in order to be available for study, and the conservation treatments employed must not interfere with subsequent analysis. Both these factors - the historical significance of the site as well as the variety and quantity of material which has been preserved in the cold, wet climate of coastal Labrador - made the establishment of a conservation plan mandatory. The operation of the field lab represents the first stage of this plan.

The Building and Facilities

The lab itself is housed in a one-storey building that is serviced with electricity and running water. The water is gravity-fed from a fresh-water stream. For use in the lab it is passed through particle filters, then, optionally, through deionizing columns to remove soluble salts and dissolve organic material. Heat is provided by an oil-burning stove. Total floor space is 748.8 ft^2 (69.6 m^2). The available space has been divided into activity areas as illustrated in Figure 1. The activity areas reflect the functions that the lab fulfills: artifact registration, conservation and storage, equipment storage, and visitor (tourist) access. Within this space, a staff of four can work comfortably: a registrar and assistant registrar, a conservator and conservation assistant. There is also the capability of setting up temporary work areas for extra staff. The functions of the lab staff are as follows:

1) Registration of all material, on a daily basis. Material requiring special handling or packaging gets priority in registration.
2) Preparation of conservation condition reports for objects requiring conservation treatment, packaging of these objects and storage under appropriate conditions.
3) Conservation of selected objects when time permits.
4) Assistance in the field, e.g.: block-lifting fragile objects.

1) Registration

All registration information is entered into a computer using a program that is compatible with the Paris System being implemented by the Canadian Heritage Inventory Network (CHIN). A portable computer with storage on floppy discs is used to record information in the field; at the end of the seaon the data from the discs can be transferred to the mainframe computer at Memorial University. There is space in this program to include conservation treatment information at a later date.

2) Conservation: Recording and Packaging

After registration, the objects requiring further treatment are first sketched and described by conservation staff, then packaged in such a way as to minimize deterioration.

Figure 2 is an illustration of the form that is filled out for objects requiring conservation. The information on this form is the basis of the treatment record, which will be a history of the object from the time of excavation to final conservation. It is useful to begin a conservation treatment record for each object as soon as possible after excavation. The goal is to keep subsequent handling of sensitive material to a minimum, to streamline decisions about future storage and treatment, and make final packing up of the lab at the end of the season as easy as possible.

Table 1 gives a guide to the storage conditions and packing techniques for different types of material, considering their individual needs and the final proposed treatment. With the exception of the ceramics, most of the glass and some of the bone recovered, all the material from the site must be kept wet. Although it is well known that waterlogged wood and other organic materials will deteriorate very rapidly on drying, it is not always understood that metal objects, depending on the nature and extent of mineralization should also be kept wet, especially if an aqueous treatment method is to be used (Logan 1984). It is not difficult to keep objects damp as the average length of time between excavation and registration is only one day.

A list of packing materials is provided in Appendix 1. For long-term storage, packing and support materials should be inert: i.e., they should not degrade in the storage medium. This is especially important in selecting a material to use in tagging artifacts. As mentioned previously, all artifacts are catalogued prior to being wrapped and stored. The catalogue number assigned to each object is duplicated on Teflon[R] tape that will not dissolve or degrade in water, most solvents, acids or alkalis. The tape is purchased in rolls that are cut to a width that allows them to be inserted into a Dymo[R] label maker. The catalogue numbers are embossed on this tape and tied onto the objects with florist's wire, or, in the case of iron objects packaged for x-raying, with plastic fasteners ("Dennison" fasteners) which will not appear in the x-ray images.

a) Metal

For the Red Bay metal artifacts, iron represents the largest group of problematic material. The iron from the site is in extremely poor condition. Objectgs typically have a thick corrosion layer surrounding a fragmentary metal core. The amount of corrosion and metallic iron varies depending on the object and its burial environment. If allowed to dry without treatment and if stored under ambient conditions, objects containing iron will disintegrate in a few months. Conservation treatments cannot guarantee 100% success, therefore all the iron is recorded in the field by radiography.

After excavation the iron is immediately put into buckets of fresh water. During cataloguing, the objects are kept in shallow trays, covered with wet rags. After conservation condition reports have been written, the objects are individually wrapped in cotton gauze, tagged with their catalogue number and stored in fresh water, according to provenience. When enough objects from each area of the site have accumulated for x-raying, they are secured in sandwiches of polypropylene screening measuring 14 x 17" (35.5 x 43.2 cm), the same size as the x-ray film used (Figure 3). Tracings are done of each x-radiograph and the catalogue number of the objects recorded on each tracing (Figure 4, 5). The number of the x-radiograph that an object appears on is recorded on the condition report for that object. The objects remain in their polypropylene sandwiches during shipping and in storage at Memorial University. Using this packing and recording technique, order is maintained and the archaeologist has a visual record of all the material from specific locations of the site even if the material is not easily accessible (Logan 1984).

Other metals, such as lead, copper, and their alloys do not pose major problems for conservation. Lead is stored in fresh water; copper in deionized water. Conservation of these metals can be carried out in the field lab, time permitting (see section 3).

b) Organic Material

i) Wood

The large quantity of waterlogged wood retrieved does not present major problems in terms of conservation. The bulk of the wood is treated at Memorial University by stabilizing with polyethylene glycol (PEG 400) followed by freeze-drying (Tuck 1981). Any wooden objects that appear to require specialized treatments are singled out for shipping to CCI but the majority are simply tagged with their catalogue number, stored in water and sent to Memorial at the end of the season. Conservation treatment records are not started for each piece of wood; this information can be entered on the computer at Memorial when treatment begins. For shipping, the field storage tanks become crates. The water and artifacts are removed and the objects are packed in the crates between layers of Microfoam®, Bubble Pac® and sphagnum moss.

(ii) Textiles/Leather

Textile and leather artifacts are often brought to the lab in a soil matrix. Preliminary washing is carried out to assist in identification and to remove soil that would be abrasive if left on the objects for shipping. The extent of cleaning for each object will vary depending on the condition of that object. Soft textiles may be damaged by handling when wet; these are best left to be freeze-dried at a later date and cleaned when dry.

The major difficulty in storing leather and textile artifacts is that they should be kept damp, but not waterlogged. Access of oxygen to damp organic material at ambient conditions will promote rapid mould growth which may result in staining which is impossible to remove. To reduce the likelihood of mould growth, the objects are sprayed with a strong solution of isopropanol (30% in water), wrapped in plastic (Saran Wrap® or polyethylene bags) and stored in the refrigerator. Especially fragile objects are placed on a rigid support (Coroplast®) with padding, either Microfoam® or damp, clean sphagnum moss. When packing objects in crates at the end of the season, damp moss is used as padding material. This keeps the objects moist but not saturated and appears to have a fungistatic effect, preventing mould growth (Williams 1982). There is a plentiful supply of sphagnum moss in the peat bogs which surround Red Bay.

3) Conservation treatments carried out in the field lab:

Conservation treatments for some types of material can be done relatively quickly, with a minimum amount of equipment. For example, pieces of friable ceramic, fragile bone and baleen can be consolidated (see below) to preserve their strength and then safely dried. With brief training, one can clean copper and copper alloys to achieve a stable and aesthetically pleasing surface. Removal of thin corrosion layers from small lead objects and stabilization of the metal surface is also not a complex procedure. As time permits, these treatments are carried out in the field lab.

Another type of conservation treatment that can be carried out to some extent in the field is the cleaning, mending and gap-filling of pottery. This is a time-consuming process and is not carried out at the expense of other conservation activities; however, it is a process that is interesting for the crew and visitors to the lab.

a) Consolidation

The consolidation of degraded ceramic, bone and baleen is done by saturating the objects with a synthetic resin emulsion followed by slow drying to enable the water to evaporate with the minimum stress to the object. The difficulty is deciding when to consolidate a specimen: one of the basic goals of conservation is to preserve material with as little alteration of it as possible. Saturating organic specimens with a synthetic resin may interfere with subsequent analysis (for example, carbon-14 dating). This is a decision that has to be made for each object, and often the decision is to try to remove the water without resorting to consolidation, knowing that afterwards the object may not be as pleasing visually nor as physically strong, but the value of the specimen for subsequent analysis will not have been altered.

The 16th century glass that is found at Red Bay is sometimes in extremely poor condition and in very rare cases requires consolidation before being dried. Being composed of silica with sodium, calcium and potassium fluxes, it deteriorates during burial due to leaching of the fluxes from the silica network. This type of deterioration produces a system of minute cracks in the glass, called "crizzling". Extreme crizzling can result in loss of the surface of the glass unless a consolidant is introduced to hold the tiny cracked fragments together.

To consolidate wet, crizzled glass, the water must be removed without initially drying the sherds. This is done by immersing the sherds in organic solvents: first acetone, which will replace the water in the glass, followed by toluene, which replaces the acetone. The sherds are then brushed with a 2% w/v solution of an acrylic resin (Acryloid B 72^R) dissolved in toluene as they are allowed to dry. This controls surface gloss and ensures penetration of the consolidant.

It is important to record the brand name, grade and if possible, the chemical formulation of any consolidant used. Should the object be required for chemical examination at a later date, this information is essential. For the Red Bay bone, baleen and ceramics, we prefer to use Rhoplex AC-33^R, an emulsion of an acrylic resin. Rhoplex does not contain the waxes or starches that are found in most commercially available white glues. The acrylic resin will remain stable chemically for a long period of time, with no deleterious effects to the object.

b) <u>Cleaning Metal:</u>

Copper and copper alloys are treated by removing soil and loosely adhering corrosion with wooden picks, sharp scalpels, pins and brushes. The objects are then placed under vacuum in a 2% solution of benzotriazole in ethanol. The vacuum is applied and released repeatedly to force the solution into the remaining corrosion layers and into contact with the surface of the metal. Benzotriazole reacts with copper to inhibit further corrosion (Richey 1972; Greene 1972). The objects are then coated with a lacquer prepared by dissolving Acryloid B-72^R in acetone in a proportion of 3% w/v to give some protection against humidity fluctuations and handling.

It is not always necessary, or desirable, to remove corrosion from metal. In cleaning the copper artifacts, the aim is to retain a smooth layer of corrosion over the surface of the object. Treatments for lead, however, remove corrosion layers, thereby exposing the underlying metal. Although the corrosion products which form on lead are generally quite stable chemically and posed no threat to the object, on the Red Bay lead there is a large quantity of organic material incorporated in the corrosion layers. This could result in further corrosion of the metal during storage, so the lead from the site is usually "stripped" of its corrosion. This is done in the field lab by dissolving the corrosion in a chemical solution which leaves the metallic lead unharmed. Large lead objects or heavily corroded objects are not treated in the field; they are stored in water and are treated by electrolytic reduction, carried out at the CCI during the winter.

In order to remove thin corrosion layers from small lead objects, a solution of diethylenetriamine pentacetic acid (DTPA) and sodium hydroxide (NaOH) is prepared, first by dissolving NaOH in deionized water, usually in a proportion of 2% w/v NaOH/water. Enough DTPA is dissolved in the NaOH solution to lower the pH of the solution to 5.5 (measured with pH papers). Objects are immersed in individual containers of DTPA/NaOH which are heated in a water bath to a temperature of between 50°C and 60°C. Average length of time of immersion is one half hour. The objects are then rinsed with tap water, dried by rinsing with acetone to remove excess water, and then the surfaces are brushed with a soft brush. The clean lead is coated with Renaissance^R microcrystalline wax to protect it against atmospheric moisture and organic acids.

If there is any doubt as to the composition of a metal, treatment is not carried out until the metal can be identified. Certain alloys and "white" or "grey" metals are difficult to identify in the field. Analysis of these materials is done at CCI headquarters by the Analytical Research Services Division.

4) Assistance in the field

It is sometimes necessary to provide a support for particularly fragile artifacts before attempting to lift them from the soil. Examples of such artifacts include mineralized iron objects, shattered ceramic sherds and large pieces of soft textile. Many small objects are routinely lifted in blocks of soil by the excavators. The objects can then be removed carefully from the soil matrix in the lab, making it possible to record the orientation of individual pieces while minimizing damage. When it is necessary to apply such a support to the exposed surface of an artifact prior to undercutting and lifting, a number of options are available and the field conservator must select the most appropriate materials and technique for each situation. The only "rules" that must be adhered to are:

1) the support material must be easily removed from the object, yet be able to be moulded to contours of the object;
2) the material should be easy to apply; in some cases this involves compatibility with environmental conditions: e.g.: plaster of Paris is difficult to apply in rain or high wind;
3) the support should be made of material that is chemically compatible with the storage environment into which the artifact will be placed, and
4) it should be as light in weight as is practical.

Supports are not always absolutely rigid. As an example, when facing a large piece of wet textile lying on bedrock, it was decided to prepare a facing cloth that was impregnated with an acrylic resin that would dry to a stiff yet slightly flexible shell over the textile (Logan and Segal 1985). In this case, cheese cloth was saturated with the resin (Rhoplex AC-33), and allowed to dry. The cloth was then cut into small strips, the adhesive softened with acetone and the strips pressed directly on the surface of the textile. The acetone evaporated and the strips dried, adhering to the nap of the fabric. There was enough flex to the facing to allow the textile to be loosened from the bedrock on which it was lying and to be lifted safely. The facing was later removed by re-softening the adhesive with acetone.

In most instances, the object is covered with an isolating layer of aluminum foil or gauze prior to applying the support material. Support materials most often used at Red Bay are, in order to frequency: paraffin wax, car body filler (polyester putty), facing cloth prepared as described above, and plaster of Paris. The type of block lifts most often carried out are on mineralized, broken iron objects. These are pedestalled, covered with foil, then coated with molten paraffin wax. In the lab, excess dirt is removed and the object is x-rayed on its support. The objects remain on their supports for shipping.

CONCLUSION

In discussing the operation of the field lab at Red Bay, it is impossible to avoid the subject of responsibility for conservation - who is ultimately responsible to ensure that the objects are conserved and that the maximum information value is retained? In the Province of Newfoundland and Labrador, the permit to excavate places the legal responsibility on the archaeologist. In the case of Red Bay, the archaeologist realized that he would require assistance, which he sought from CCI. CCI accepted the responsibility of providing a plan for conservation; however, CCI does not have the resources to treat all the material coming off a site. In order to assist Memorial in treating the bulk of the material (primarily iron and wood), CCI has carried out characterization studies of these materials and, in the case of the iron, devised a comprehensive recording system as well as a treatment program for the collection (McCawley 1984; Logan 1984). Objects that require special analysis or individual treatment are sent to CCI where they are worked on by staff and interns over the following months. This is obviously not an ideal situation; it would be preferable if all the material could be treated at Memorial where it would be available for study by the archaeologist and where the archaeologist could have more direct input into treatment and analytical decisions. However, the joint operation of the field lab is an important first step in the overall success of the conservation plan for this site and one in which the concerns of archaeology and conservation overlap.

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TABLE 1

MATERIAL	FIELD HANDLING	1] INITIAL CLEANING	2] STORAGE/PACKAGING	FIELD LAB 3] TREATMENTS
Wood	Keep wet	wash	Fresh H_2O	
Textile	Keep damp	wash if possible	-on support with padding & fungicide -cold storage	
Leather	Keep damp	wash	-on support with padding & fungicide -cold storage	
Iron	Keep wet		-wrap in gauze; package in polypropylene screening -x-ray -store in deionized water	
Iron with organic material (composite objects)	Keep wet		-as for iron	
Copper & copper alloys	Keep wet		-store in deionized water	-dry -mechanically clean -stabilize
Lead	Keep wet		-fresh water	-chemically remove corrosion
Silver	Keep wet		-dry & store dry	
Degraded Bone; Baleen, Antler, horn	Keep damp	-wash -or dry and clean when dry	-damp, if going to consolidate	-consolidate only if necessary -dry; store dry
Glass	Keep damp	-wash	-dry and store dry	-consolidate only if necessary
Ceramics	Keep damp	-wash	-dry and store dry	-consolidate only if necessary

APPENDIX 1

<u>Wrapping and cushioning and support materials</u>

1] Polyethylene Sheeting:
- chemically stable
- water resistant
- transparent
- available from hardware stores and building supplies
- current cost per roll: around $80.00 for a 100' long "rack roll", 4 mil. thickness

*2] Polyethylene Foam: ("Microfoam")
- white, stable
- comes in rolls of varying thicknesses and textures
- other trade names: "Ethafoam" (Dow Chemical) "Sentinel Foam" (Dorfin Packaging)
- good for cushioning; thinner types are more useful
- objects wrapped in this will float
- cost/roll (60" wide, 750' long): $140.00
- available from packaging suppliers; find distributor

*3] Bubble Pac:
- polyethylene sheets with air pockets
- bubbles break easily
- available in a range of bubble sizes, but small bubbles are more versatile
- cost: roll of 3000 sq.ft.: $220.00 (small bubbles)
- contact packaging suppliers

*4] Cotton gauze/cheesecloth:
- from fabric stores
- will grow mould and degrade in wet storage
- very soft and useful in some cases, i.e., for binding loose associated fragments together

5] Nylon/cotton gauze:

- stretchy bandages, in a variety of widths
- stable in a wide range of chemicals; the cotton will deteriorate in long-term wet storage
- soft
- available from Smith and Nephew, Inc. Lachine, Quebec
- approximate cost: 1" wide: $7.55/doz.
  6" wide: $25.80/doz.

*6] Terry Toweling (white):

- for covering large artifacts; keeping surface wet
- available from fabric stores in rolls

*7] Saran Wrap:

- polyvinylidene chloride film
- clings to damp surfaces; will prevent movement of objects
- not to be used for indefinite storage with metal artifacts
- available from: Hardware, grocery stores

*8] Aluminium Foil:

- excellent as an isolating layer in blocklifts
- cannot be stored in alkaline or acid solutions
- available from: Hardware, grocery stores

9] Nylon Screening:

- soft
- will degrade in some chemicals, ie: hot PEG, hot alkalis
- good for packing material for storage in solution where diffusion is important
- available at hardware stores (door screening)
- cost: approximately $100.00/roll

*10] Polypropylene Screening:

- more chemical resistance than nylon screening, especially in hot alkalis
- stiffer than nylon screening

From: Cole Parmer
7425 North Oak Park
Chicago, Ill., USA 60643

- Cost: $39.15 (U.S.)/roll

*11] Polyethylene Boards: ("Coroplast")

- like cardboard, but is made from polyethylene and is stable
- floats in wet storage
- good for support for flat or fragile pieces
- board can be re-used
- available from: Cadillac Plastics, 91 Kelfield St., Rexdale, Ontario M9W 5A4
- cost: $13.58/per 4' x 8' sheet, 4 mil.

<u>Custom-made</u> <u>rigid</u> <u>support</u>: All support material that solidifies around an object must be separated from the object by an impervious material. All undercuts on an object must be padded out.

1] Paraffin Wax:

- from hardware or grocery stores (sold with canning and preserving supplies)

2] Carbody Filler:

- a filled polyester, with a buttery consistency
- very strong and light
- sets by reacting with a hardener (a peroxide) --setting time will be affected by temperature
- cured resin will swell in paint remover
- must be used in well-ventilated work area

- available from hardware stores (suggest Canadian Tire brand)
- cost: $30.00/gal.

3] Plaster of Paris:
- powder, mix equal volume with water
- sets in 5-10 minutes
- heavy; will maintain high water content for a long time
- large pieces need reinforcing
- if plaster sets on the surface of an object, it is extremely difficult to remove - all objects/materials must be protected by separating layer
- inexpensive and readily available
- cost: approximately $25.00/50 lbs.
- available from construction supply outlets or concrete and brick companies

<u>Containers</u>

*1] Polyethylene bags:
- come in a variety of sizes, with and without closures, from Fisher and CanLab
- the most convenient bags for small objects and organic samples are "whirl-pac" bags, with a built-in tie
- these are very expensive but they save time in the field and give an excellent seal
- cost: from $60.00 for 500 small ones (7.6 x 18 cm), to $120.00 for large ones (14 x 23 cm).

2] Freezer Containers:
- polyethylene containers with tight fitting lids
- variety of sizes
- "Frig-o-Seal" best
- grocery and hardward stores
- cost: $1.50 and up

3] Polyethylene Tubs:

- available in a variety of sizes and shapes, at varying costs: $70.00 to $500.00 depending on size
- with or without wheels

Supplier: Rosedale Plastics
7240 Woodbine Avenue
Markham, Ontario L3R 1A4
Telephone: (916) 495-6980

4] Pool-liners:

- for lining large storage tanks
- can be custom-made by swimming pool companies (e.g. Mermaid Pool Distributors)
- cost: varies according to size of tank: contact local pool dealer

WARNING: The liners have a built in biocide that can be very irritating to the skin and eyes if used for small containers. In full-sized pools, the biocide dissipates, but in enclosed or small areas, it can build up to toxic concentrations.

Labelling Material

*1] Teflon Tape:

- must be cut to order; specify .015 in. thick, 1 cm wide to fit into a Dymo labeller
- available from: Cadillac Plastics, 155 Colonade Rd., Nepean, Ontario Tel. (613) 226-7487
- cost: per roll: $4.71 - order in bulk (i.e., 30 rolls at a time)

2] Water-proof Labels:

- polyethylene coated paper

- not as durable as Teflon Tape
- can write on them with alcohol markers; writirg eventually fades in water and runs in PEG solutions
- available from: Kimball Systems, 8300 Cote de Liesse, Montreal, Quebec
- cost: average cost, case of 500/8 x 11 1/2" sheets: $180.00 can get better rates buying in rolls

Fasteners

*1] Dennison attaching systems:

- a variety of loops and fasteners - used by retail stores to attach price tags to garments
- must buy the fastening gun: cost of gun: $50.00 each
- good for attaching labels to screening
- cost of fasteners: approximately $253.00/lot of 50,000 for single fasteners (average cost)
- available from Dennison of Canada contact retail stores to get local suppliers

2] Monel Staples:

- "Swingline SF4-Monel"
- corrosion resistant, nickle/copper staples
- from hardware stores
- cost: approximately $15.00/box of 5000 standard size
- from: Talas, 104 Fifth Avenue, New York, N.Y. 10011

*3] Plastic Ties:

- polyethylene - coated wire stable in most storage solutions
- available from Fisher, Canus, CanLab Scientific supplies
- cost: $30.00/roll of 1,500 feet.

*Material discussed in the paper

APPENDIX 2
Chemicals

Caution: Some of the chemicals listed are hazardous materials and should not be used without protective clothing or proper ventilation.

	AVAILABLE FROM:
1] Diethylenetriamine pentacetic acid:	Aldrich Chemical Co. Inc. P.O. Box 355 Milwaukee, Wisc. 53201 U.S.A. Tel: (414) 273-3850 Toll free: 800-558-9160
2] Sodium Hydroxide:	Fisher Scientific (check for local suppliers)
Health hazard: extremely caustic; must wear gloves and eye protection	
3] pH papers	Fisher Scientific
4] Benzotriazole	Fisher Scientific
Health hazard: is a possible carcinogen Avoid skin contact and inhalation	
5] Consolidants: Rhoplex AC-33 Acryloid B-72	Rohm and Haas 2 Manse Road Westhill, Ontario Tel: (416) 284-4711

6] Solvents: Acetone — Fisher Scientific
Alcohol (ethanol)
Toluene

Health hazard: are flammable; can induce dizziness and nausea;
Avoid skin contact and inhalation
Acetone and toluene can degrease skin, resulting in dermatisis

7] Isopropanol: — Fisher Scientific, Drug Stores
Breathing concentrated vapours may cause nausea, headaches

8] Water Purification:
a) Water filters to filter particulate matter: Contact water purification companies ("Culligan") or swimming pool suppliers

b) Deionizing columns: — Fisher Scientific
i) Barnstead high capacity
ii) Barnstead organic removal

Figure 1

Floor plan of lab.

Functional Areas:

A: Conservation

B: Registration

C: Artifact Storage

D: Display Area

E: Equipment Storage

//// Shelving - equipment and Artifact storage

| | | Wood and iron storage tanks

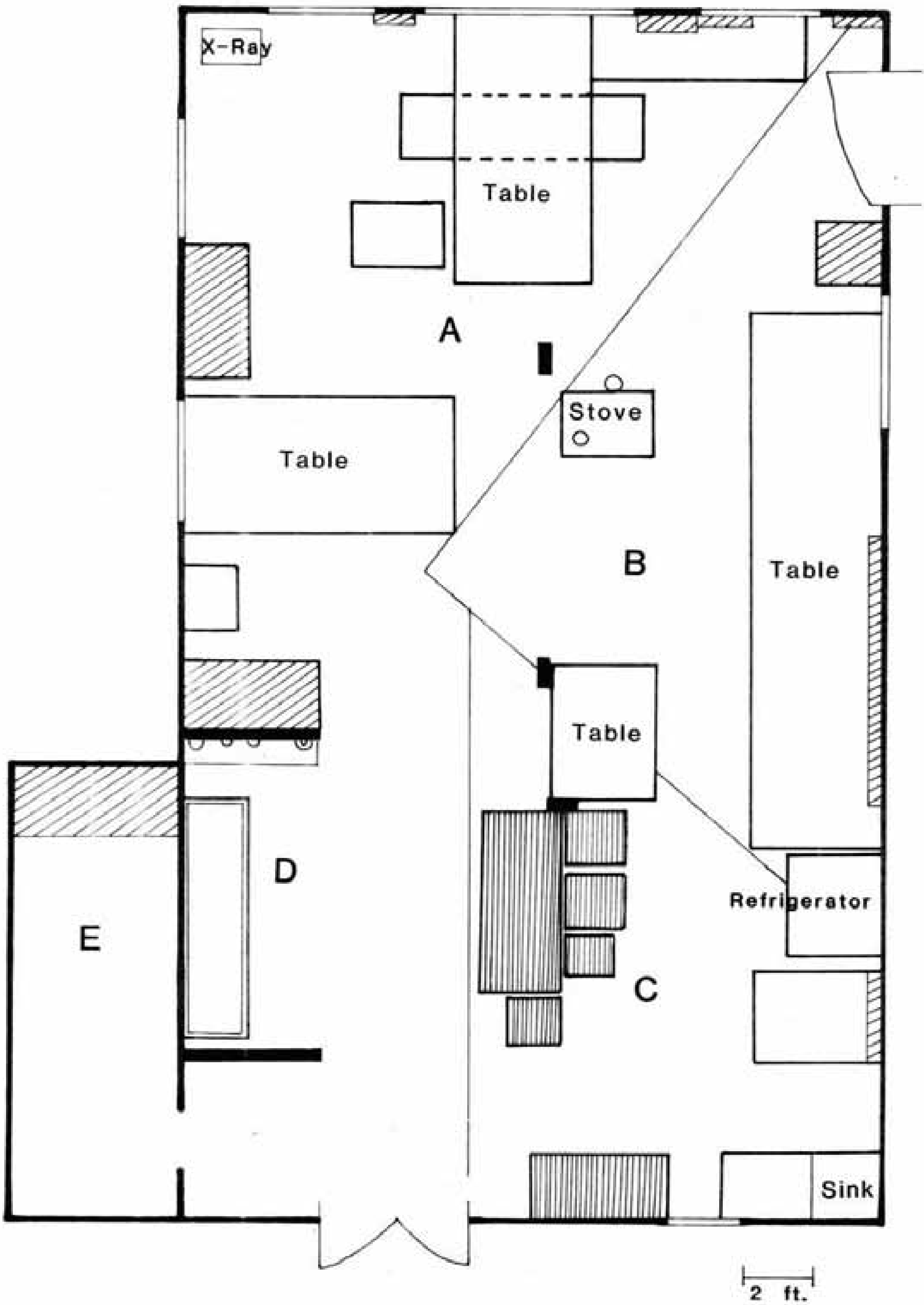

X-Ray
Table
A
Stove
Table
B
Table
Table
D
E
Refrigerator
C
Sink
2 ft.

Figure 2

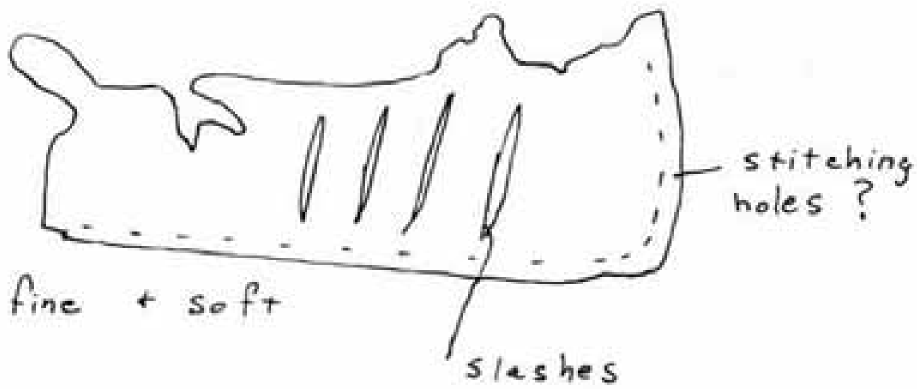
Treatment history record form.

Borden # EkBc-7: 958 | Acc. # | CCI # | Date excav. 21/07/84

Inst. | Object Garment Frag? | Func. Class

Dimensions L 13.8 W 4.5 T .05 cm D Wt | Environment silt in Pond

Description and Condition



very fine + soft

Material
Leather

Scient. Report

X-Ray:

Photography
Film #
BT
DT
AT

Pre-treatment storage 22/07/84 – on rigid support ("coroplast")

Treatment proposal
- sprayed w̄ 30 % isopropanol/H_2O
- covered w̄ Saran Wrap
- in fridge

SEND TO CCI.

Conservator
R S

Approved

Estimated Treat. Time

Estimated Comp. Date

Actual Time

Follow-up

# of Pieces
B. A.

Treated
Site CCI

Figure 3

Packing iron for x-raying. The objects are secured between 2 layers of polypropylene screening, with their catalogue numbers (on the white reflon tape).

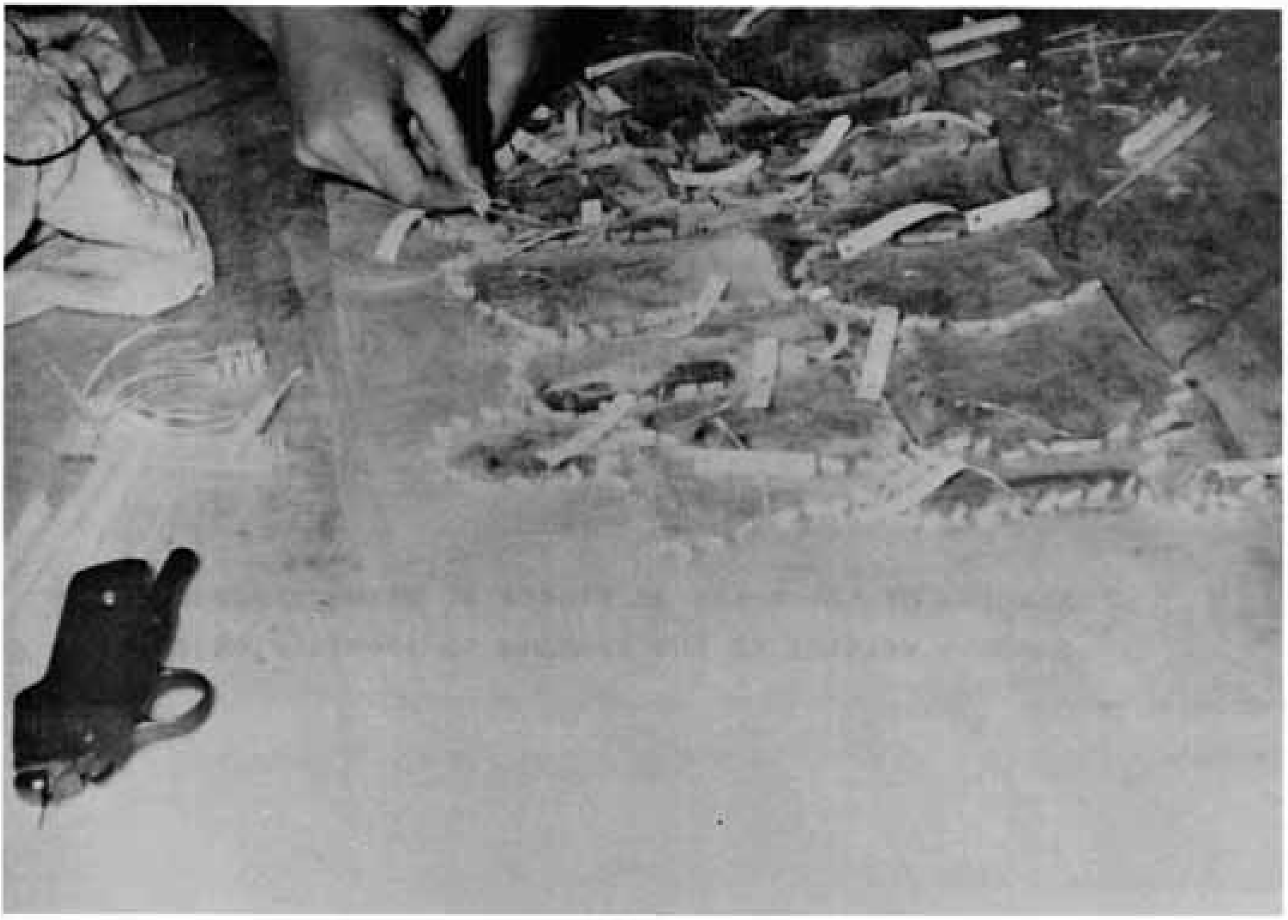


Figure 4

X-ray of nails and tools from a cooperage. White indicates metalic iron; greyish areas are completely mineralized, ie: no metal remaining.

Figure 5

Tracing of the x-ray in Figure 4, with catalogue numbers written on the tracing to identify objects.

Figure 4

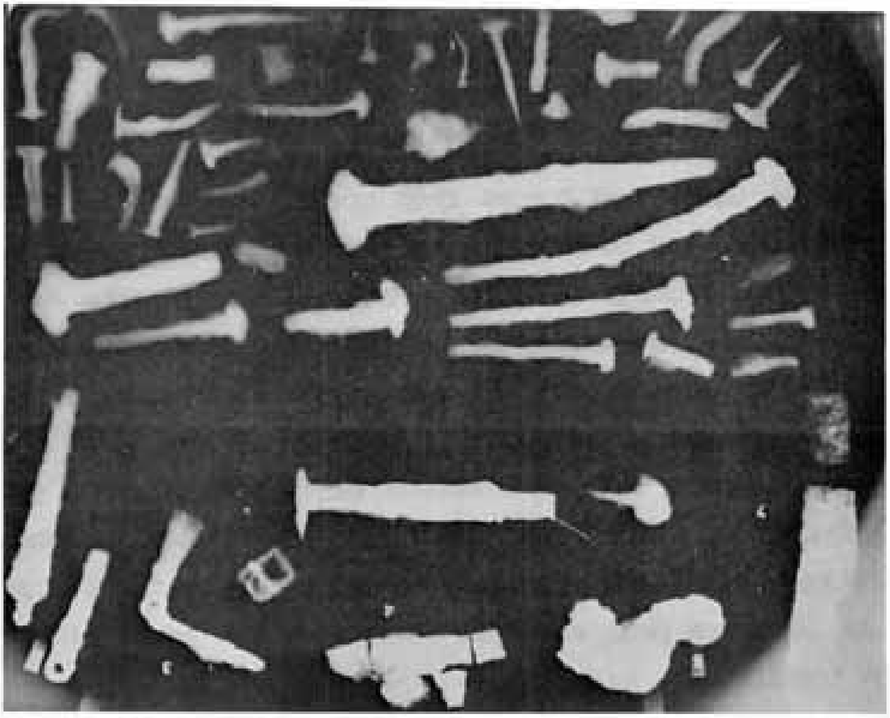


Figure 5