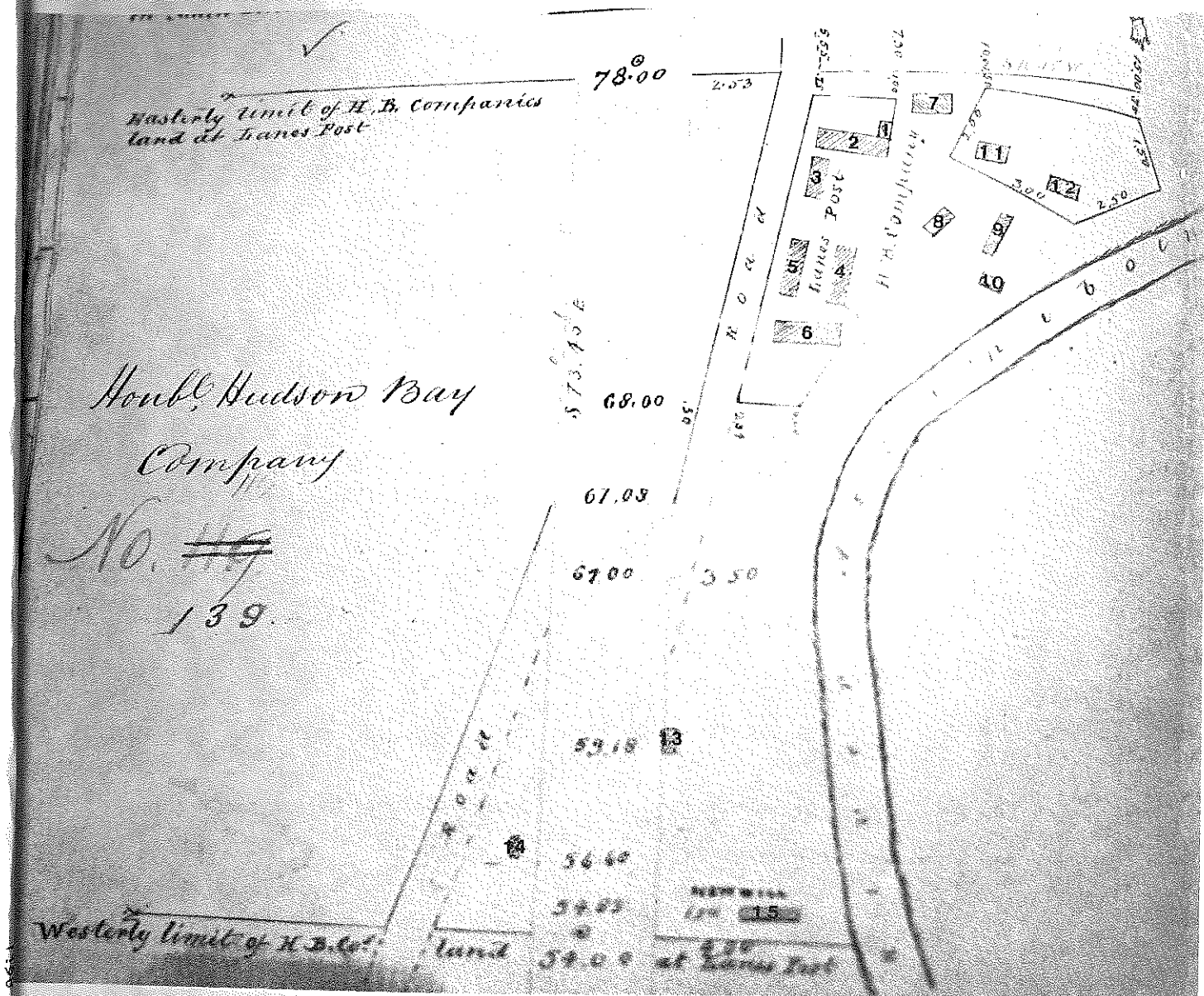


# Manitoba Archaeological Quarterly



THE CONSERVATION OF WOOD/METAL ARTIFACTS FROM UPPER FORT GARRY

by

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In 1981-1983, a team of archaeologists led by Dr. Greg Monks of the Department of Anthropology, University of Manitoba, undertook an excavation of the southwest section of former Upper Fort Garry. The remains of this Hudson's Bay Company fur trade post is located in Bonnycastle Park at the corner of Main Street and Assiniboine Avenue in Winnipeg, Manitoba. During these three field seasons, approximately 21,000 artifacts were recovered consisting of a wide range of materials, including ceramics, glass, leather, bone, metal, textiles, paper and wood. The artifacts made from organic materials had largely been buried in wet, relatively airless soil, which accounted for their fine state of preservation.

With the discovery of the wet organic materials, the Manitoba Museum of Man and Nature's conservation laboratory joined the archaeological team. The wet wood, leather, paper and cloth could not simply be air-dried in the field laboratory. Without further conservation treatment, these artifacts would eventually shrink, crack and disintegrate with an accompanying loss of information about life at Upper Fort Garry. As a result, many of the items from Bonnycastle Park underwent cleaning and stabilization treatment in the Museum's conservation laboratory. Ultimately the Museum assumed ownership of the archaeological materials from Upper Fort Garry, while the City of Winnipeg provided generous financial support for their conservation.

Most of the wet artifacts could be cleaned, consolidated and dried by the Museum's conservation staff. In fact, 290 leather and 1166 wooden artifacts, as well as 3316 cloth fragments were treated by Ellen Robinson and Cathy Collins, members of the Museum's conservation staff.

However, the wet artifacts made from a combination of wood and metal presented special difficulties. Normally wet wood is soaked in a water-soluble wax called polyethylene glycol (PEG). This chemical gives the wood dimensional stability and allows it to dry without shrinking, warping or cracking. Drying is achieved by freezing the wood rapidly and extracting the water from the solid state under vacuum. The wax is left behind to stabilize the wood against dimensional change. The presence of metallic salts, however, can accelerate the decomposition of the polyethylene glycol and a different method of treatment must be used for wooden/metal composites.

Six artifacts from the 1982 excavations contained both wood and metal: a child's potty seat once held together with nails; three scrub brushes containing metallic wires; a shovel handle with nails and rusted fragments of a metal socket joining the blade and handle; and a wooden bucket with two rusted iron hoops. These artifacts were sent to the Canadian Conservation Institute (CCI) in Ottawa, where research could be undertaken to find a method of conservation which would preserve both the wood and metal. The CCI, a branch of the Department of Communications, provides specialized conservation services to museum collections across Canada. CCI was given permission by the Manitoba Museum of Man and Nature to proceed with experimental treatments on these artifacts as a means of furthering the development of conservation techniques for wood/metal composites recovered from other archaeological excavations of waterlogged sites. CCI had been carrying out extensive research on materials for use on wood/metal composites, but had not yet had the opportunity to apply the results of its research to actual artifacts. The Manitoba artifacts presented CCI one of the first opportunities to test its findings.

At CCI, all of the artifacts were X-radiographed prior to treatment to identify precisely the locations of the metallic parts. The species of wood for each was also determined, because each species has its own rate of absorbency and dimensional stability. The degree of deterioration was also noted.

The three scrub brushes, made of beech and containing iron and brass, were treated with various stabilizing chemicals (Figures 1-2). The resins chosen had shown promise on samples used by CCI to test fifty commercial water-soluble products on wood/metal composites. From the tests three options were selected: Pluracol 824, Conco Emulsifier K and polyethylene glycol with a corrosion inhibitor Hostachlor KS. The performance of the first two chemicals, not generally used to stabilize wood, appeared to be similar to polyethylene glycol, with the bonus that the resins also inhibited the corrosion of metal. The corrosion inhibitor, Hostachlor KS, was added to the polyethylene glycol to avert breakdown of the resin by metallic residues. The three brushes were soaked in their respective solutions for a period of seven months, after which each was frozen and vacuum freeze-dried.

The potty seat and lid were found to be made of spruce and pine. Both parts were washed in water and then soaked in a solution of PEG and Hostachlor KS 1 for ten months, after which they were vacuum freeze-dried. The lid was repaired with hide glue (Figures 3-5).

After washing in heated deionized water, the wooden bucket made from bur oak was also treated with PEG and Hostachlor KS 1. During treatment, the iron bands and wood were separated. The bands were treated with tannic acid to produce a coating on the iron which resists further rusting. The wood was soaked for two months in PEG, then frozen and vacuum freeze-dried. When the treated wood and iron were reassembled, the wood had undergone sufficient

shrinkage to make it necessary to insert an extra small stave as a spacer. This insert was made from balsa wood coloured with watercolour. Black polyester twill ribbon was actually used to hold the staves together, with the iron bands placed immediately above the ribbon (Figures 6-8).

The shovel handle was found to consist of a grip of spruce and a stem of oak (Figures 9-10). The handle was washed with heated deionized water. Instead of using PEG to replace water in the wood, a solution of acetone and colophony rosin was used. Once the piece was impregnated with rosin, the volatile acetone was allowed to evaporate slowly over a period of one year.

Early in 1988, the CCI returned the treated artifacts to Manitoba. Conservators at the Museum and CCI are presently satisfied with the results of the conservation treatment, but will be checking the artifacts periodically for stability. Some of the conserved archaeological finds from Bonnycastle Park, including the bucket and one of the scrub brushes, were displayed in Alloway Hall in November and December, 1988.

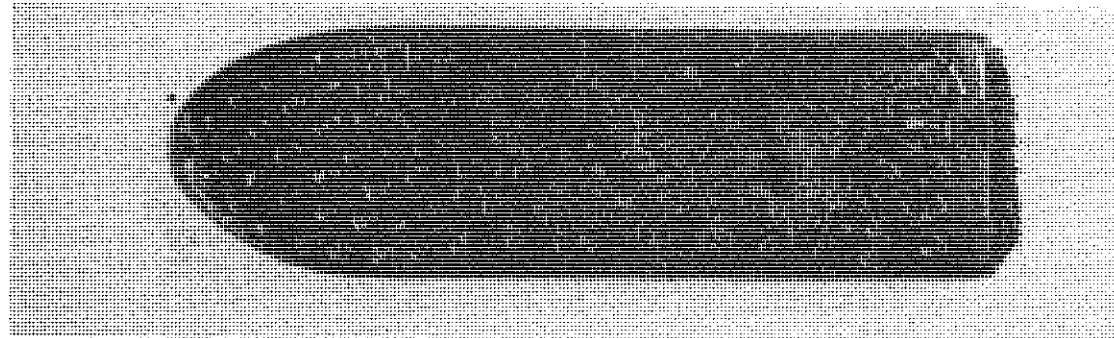


Figure 1. Scrub brush before treatment.

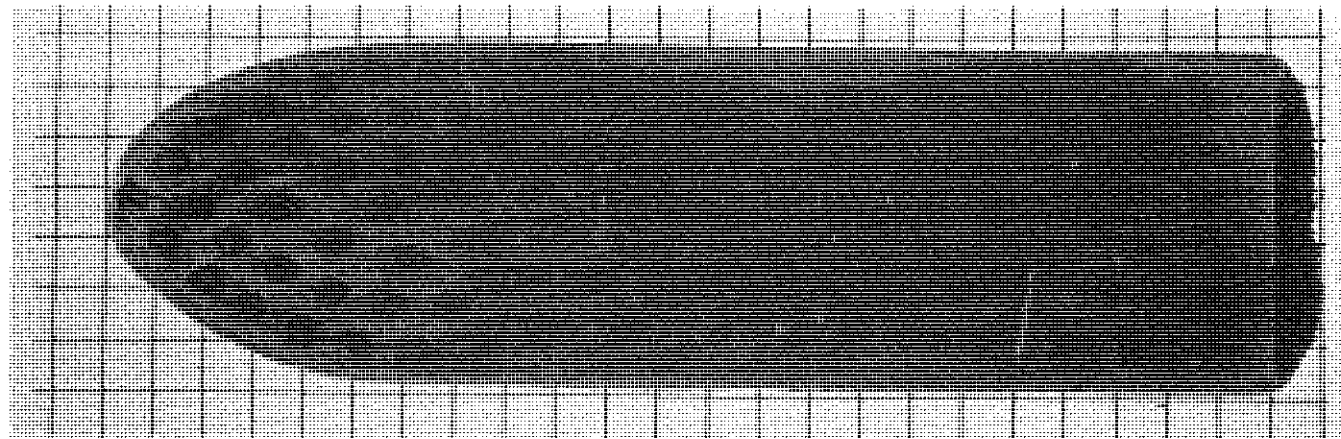


Figure 2. Scrub brush after treatment.

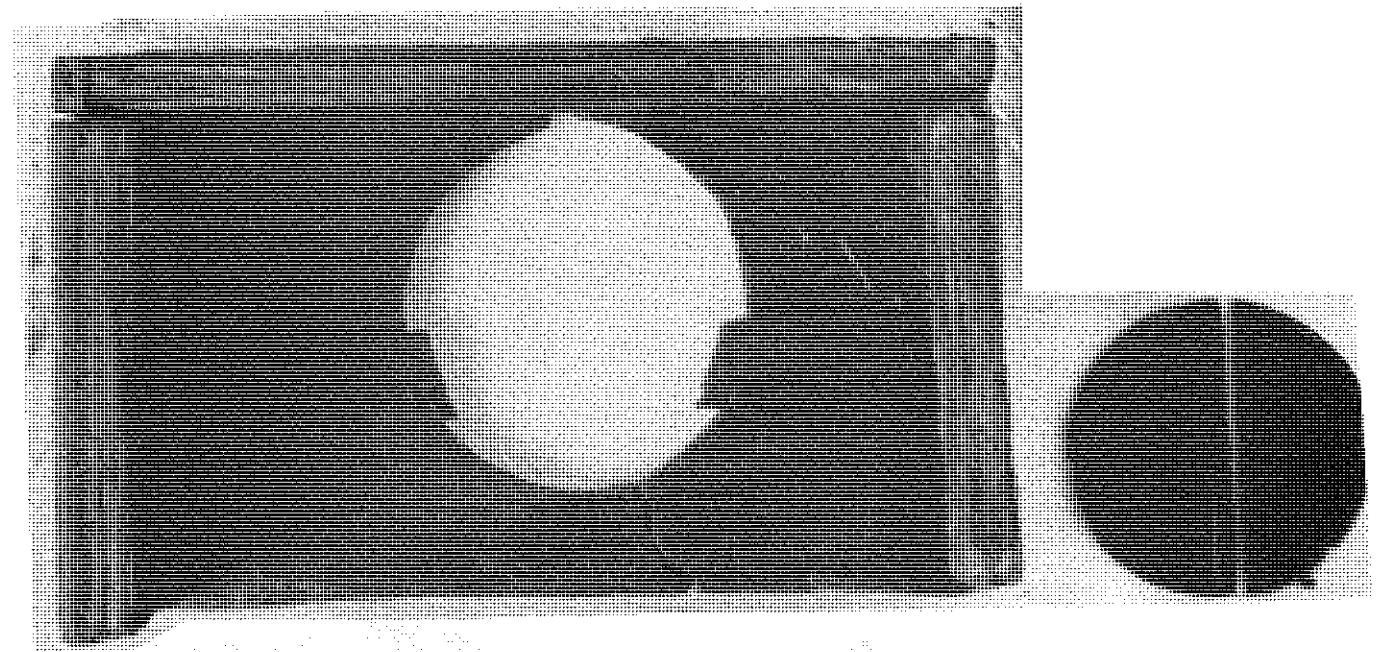


Figure 3. Potty seat and lid before treatment.

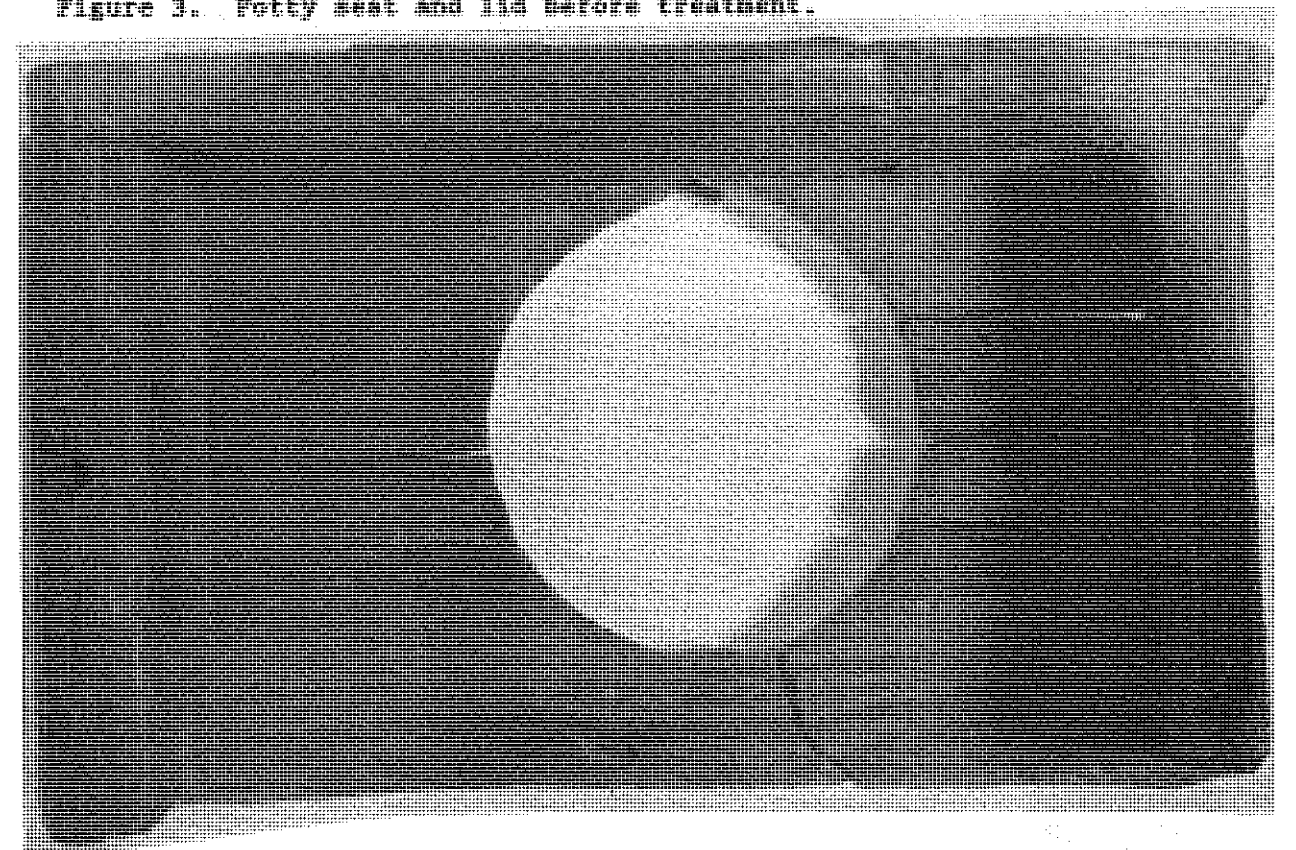


Figure 4. Potty seat and lid after treatment.



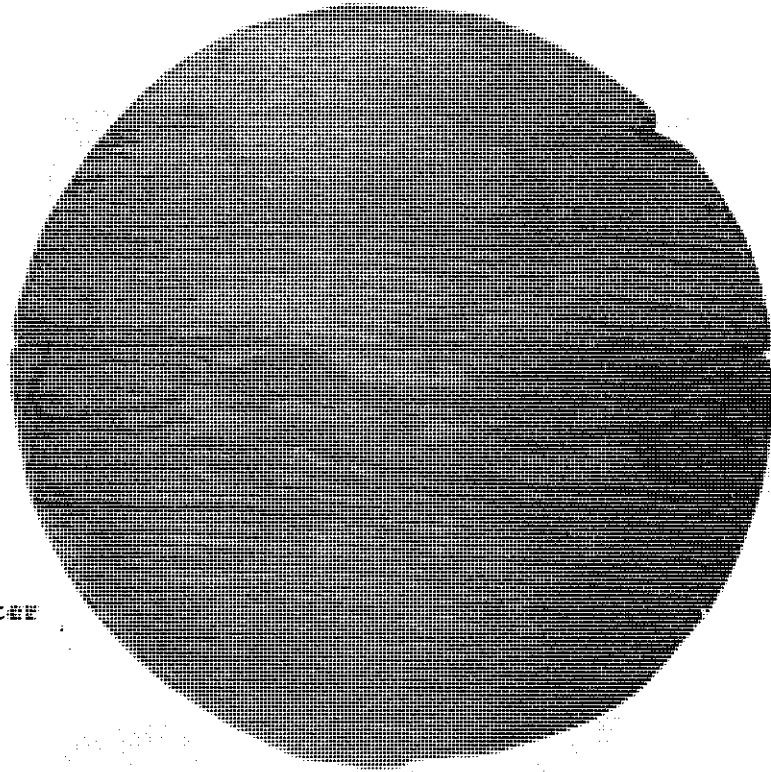


Figure 5. Potty lid after treatment.

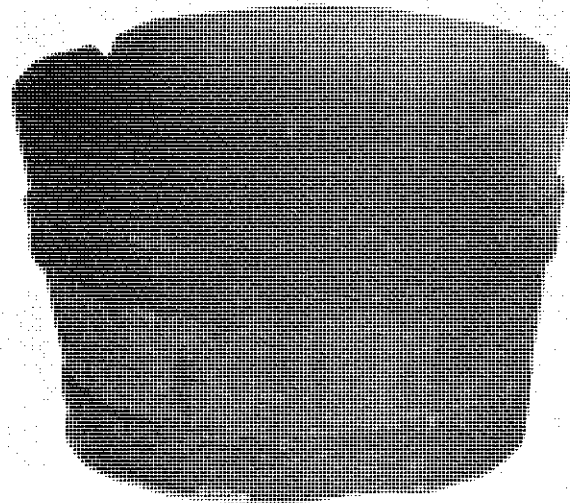


Figure 6. Wooden bucket before treatment.



Figure 7. Wooden bucket after freeze drying.



Figure 8. Wooden bucket after treatment.

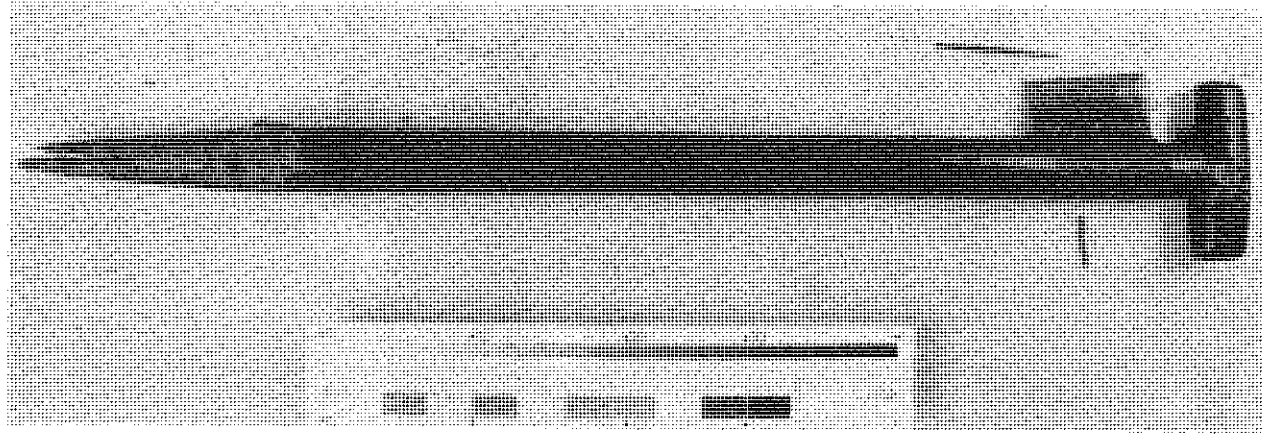


Figure 9. Shovel handle before treatment.

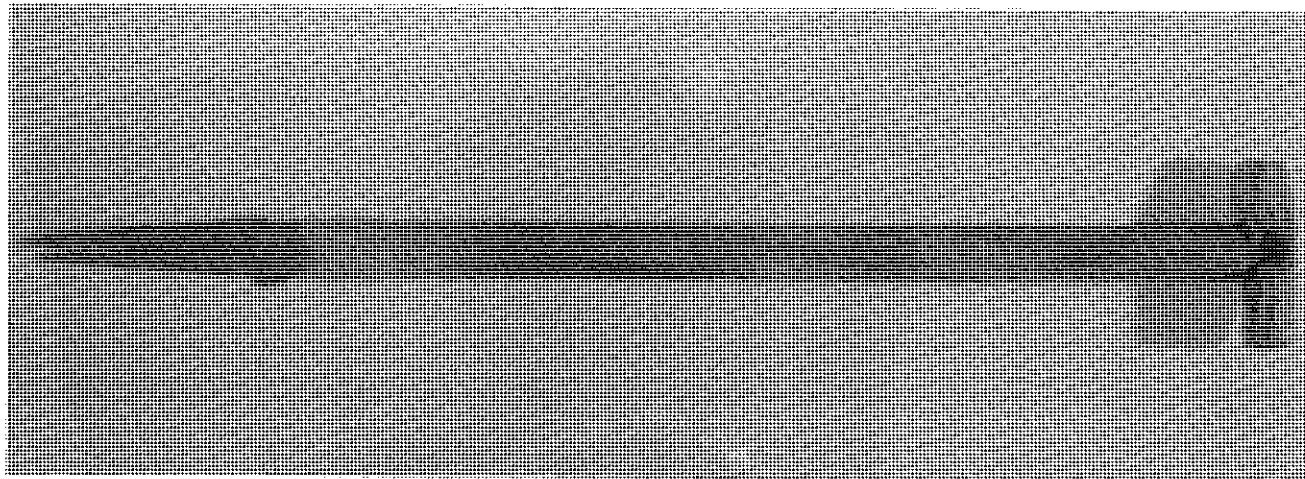


Figure 10. Shovel handle after treatment.