

## **The Preparation for Display of a 24-foot Dugout Canoe**

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The fall of 1984 was a very wet season in Arkansas with rivers overflowing their banks throughout most of the state. Regions of the state had to be declared disaster areas. The A.F. Griggs farm in rural Benton on the banks of the Saline River was largely submerged at this time. As the family was cleaning up after the flood a partially submerged dugout canoe was discovered on the bank opposite the farm in a swampy area. One of the sons floated it across the river and dragged it up on the bank with a tractor. Five to nine months passed before anyone else was notified.

The Arkansas Archeological Survey sent a team to look over the find after receiving a call and the next day I was notified to help plan for its transfer to Toltec Mounds State Park. The Griggs' wanted to donate it to the State for which they later, after dating, received a thank you letter from the governor.

In order to move the canoe from the bank onto a flatbed truck it was necessary to tunnel under it at seven stations and fit frames underneath at these points. The prefitted frames were then bolted together at their corners and strongbacks were run the length of the canoe stiffened with a truss system above. A front end loader was then able to lift the truss and canoe onto the truck without incident. The boat was wrapped and secured for the thirty mile trip to the park.

The surface of the canoe is covered with brown rot but the bottom, being about five inches thick contains a good deal of sound wood. Since the canoe had been exposed to the weather for half a year cleaning the dirt from the surface was done with a garden hose and low pressure water aided by a nylon bristle paint brush.

The wood was identified as belonging to the Southern Yellow Pine group. Core samples were taken for dendrochronological analysis at the University of Arkansas - Fayetteville where data banks were available for Southern Yellow Pine and Cypress grown in the central part of the state. Two positive correlations were revealed, one in the late 1600's and the other in the late 1800's.

After carefully washing off the worst of the dirt we began to identify the problems to be faced. To determine the depth to which the brown rot had penetrated, the surface was pierced with a needle until solid resistance was felt.

Measurements were taken at thirty centimeter intervals inside and out five centimeters down from the gunwale, five centimeters up from the bottom outside, and down the centerline of the bottom inside. Although the canoe had been out of the water for half a year, treatment with a bulking agent was considered. It was dismissed after the depth of penetration of the rotted surface and the remaining amount of sound wood was determined.

There are a number of problems associated with bulking agents. Sucrose, sodium chloride, and polyethylene glycol (P.E.G.) will "bloom" if the relative humidity increases beyond a critical point. PEG and sucrose do not naturally inhibit microbial growth. All three will change the appearance of the surface. Since they must enter the wood by diffusion it would have been necessary to water-log the canoe. After

consideration of the boat's recent history, the depth of rot, and the amount of sound wood remaining, it was decided to continue to dry the canoe in a protected outdoor environment.

A drying shed was constructed and lined with two layers of six mil polyethylene as a termite shield. The canoe was stickered at nine stations along its length with each stick being shimmed into contact with the bottom.

When funds become available to continue with the project and we have prepared the indoor display area, two core samples will be taken to accurately determine moisture content.

The Toltec Mounds State Park reception center, where the canoe will be displayed, is small and so the canoe will be situated in an entrance corridor. Fire code dictates that at least four feet of clear passage be present. Since the corridor is six feet wide and the canoe approximately twenty inches very little room is left. Visitors to the center would be able to handle the canoe if not protected.

The relative humidity inside the center is out of control and ranges from a summertime high of about 75% to 45% in winter. The temperature stays in the 70's year round, It is desirable that the case be moveable for occasional situations that may arise, We need to protect the canoe from visitor handling and to control the climate inside the case.

Three types of case material are being considered, UF-3 and SAR plexiglass, and tempered glass. Two methods of controlling the relative humidity are being considered, a small dehumidifier! humidifier system and a buffer system using silica gel conditioned to provide a 60% relative humidity.

According to numerous tests done at the U.S. Forest Products Lab, growth of wood rotting fungi was retarded at 25-30% MC and stopped when a uniform 20% MC was reached, Tests have also shown that white and brown rot fungi can remain viable after more than ten years dormancy, By maintaining the moisture content of the canoe at considerably less than 20% and protecting it from unnecessary handling it is hoped that further deterioration will not occur.

I would welcome comments and suggestions on what has been done so far.