

Annual Subscription, \$1.50

Single Copy, 50c

THE TREE-RING BULLETIN

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PRESERVING AND SURFACING ROTTED WOOD AND CHARCOAL

E. T. HALL, JR.

The following procedure was found satisfactory by this writer, who has excavated large amounts of rotted wood and charcoal.

Treatment in the case of good, solid specimens is simple. It is necessary to prevent the specimen from drying too fast when uncovered, to hold it together, and to protect it from any pressure and jarring in transit. The specimen, if it must be temporarily left *in situ*, must be kept shaded from the sun. If it is to be removed at once it is placed in a container in the shade; a cardboard box or even paper bag will do. It may be wrapped when convenient, but the sooner the better. Sufficient amounts of cotton batting and string are all that are required. In the case of large specimens cheesecloth, newspapers, and occasionally splints are added. Newspaper is amazingly adequate when well wrapped around a beam, over the cotton.

It is well to permit slow drying for specimens that are fragile but important. Then apply a thin solution of alvar and acetone. This solution will soak into the specimen; if necessary, repeat the applications until the specimen is saturated. For example, a cross section of pinyon, about 77 mm thick and 6 cm in diameter, was uncovered. One side was rotted, the other charred; it looked almost impossible to remove intact. It was allowed to dry slowly, then treated with a thin solution of alvar and acetone until it was saturated. When the alvar had set the specimen was removed from the ground and the other side treated. This specimen has now been surfaced and dated and is still intact.

Alvar will not cloud a fractured surface; in fact, it is difficult to detect, and aids in controlled fracture.

The method used for charcoal is largely determined by the use for which the specimen is intended. Most dendrochronologists know that it is imperative to be able to see the cell structure of the wood or charcoal in order to read it at all. It is necessary to be able to identify the rings with absolute accuracy. If one cannot see the cells he cannot expect others to accept his dating of the specimen, for some doubles may show up as annuals and some microscopic rings may be obscured. The following methods have been used for surfacing charcoal and rotted wood: grinding, cutting with razor, sandblasting (which makes the latewood stand out in relief), fracturing, cutting with a sharp razor blade after treatment with some medium which will support the cells. Of these only the two latter have been found satisfactory. For most dating a fractured surface is ideal and shows the structure more clearly than any other. For photographing and measuring it is necessary, as repeatedly emphasized in the Tree-Ring Bulletin, to have a plane surface which at the same time still shows the structure of the wood.

Since methods described to date have not been entirely satisfactory, the writer has been experimenting with others and offers the following as an alternative.

A plane surface is not difficult to make. The charcoal may be sandpapered, cut with a razor, filed, or ground. The last has proven most successful. A

large, coarse, true grindstone is used, holding the specimen firmly in the hand without pressing against the stone too hard and grinding on the side of the stone. This amounts to chipping away the charcoal in many places at once. To date no specimen has come apart under this treatment, although care must be exercised. This ground surface is absolutely illegible; additional processes must be used before the rings are legible.

1. If the specimen has not been saturated in an alvar solution it is well to do so. This solution should be a very thin one, and a few hours of total immersion should be sufficient.

2. Dry specimen; if desired, mount on a small board. After this much depends on the preferences and ingenuity of the worker who may develop some techniques of his own.

3. Shave off thin sections with a razor until surface is smooth.

4. Make a solution of alvar, acetone, and ambroid. This writer makes separate alvar and ambroid solutions, thin enough to run freely, and mixes about two thirds alvar solution with one third ambroid solution. This medium has been arrived at after experiments with paraffin, bakelite, colloidion, alvar, and ambroid. None of these was quite satisfactory. Ambroid seems to give the alvar just enough support to make it work well.

5. By repeated applications build up a glazed surface of the above solution and let it harden.

6. Shave off surface until it is seen that very thin sections of the specimen are being removed (use a sliding cut).

7. Clear surface with pure acetone; a soft camel's-hair or sable brush is ideal for applying acetone.

8. An alternative to the above is to follow this procedure as far as step 5; then, instead of allowing coating to harden it is cut when it has sufficient body to hold the cells. The time for this varies very much and only experience can tell when the surface is right. The surface may be left as is or cleared with acetone, as desired. The writer has had more success with this method, and has used it on pinyon, pine, and Douglas fir with good results.

9. For rotted wood the procedures are the same, except that kerosene brings out the rings more clearly after a good surface has been obtained.

It is necessary to use the sharpest blades, and to discard them as soon as they are the slightest bit dull; several are often required for one specimen.

It should be possible to make thin sections and mount them. Very good thin sections of small size may be removed during step 6.

The method described above is not feasible for everyday dating as the time involved is too long, but it is useful where specimens must be prepared for photographing, or for measurement. What the dendrochronologist is looking for is a medium which will penetrate and give enough strength to the cell walls to prevent their collapse when cut, and which is not too hard to cut. It is possible that a chemist will have the final answer; in the meantime the method described here may be useful.

PHOTOGRAPHY OF CHARCOAL

FREDERICK H. SCANTLING

The technique of photography of charcoal specimens has provided a fertile field for experimentation by dendrochronologists.* Recently a number of highly successful photographs have been obtained by the writer with the aid of modifications of earlier procedure.**

*A. E. Douglass, *Tree-Ring Bulletin*, 8:10-16, 1941.

H. F. Davis, *Tree-Ring Bulletin*, 2:12-16, 1935.

E. T. Hall, Jr., *Tree-Ring Bulletin*, 5:13, 1939.

**Part of the operations under a grant-in-aid to A. E. Douglass by the Society of the Sigma Xi.