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BURLWOOD— ROYALTY'S WOOD?

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COMMON burls, such as those growing on the maple tree, yield wood with fantastically intricate and colorful grain patterns. No one knows for sure what causes burls to form on trees. They are a wild, abnormal growth somewhat comparable to cancerous tissue in animals. Some plant pathologists

English 17th century cabinet with yew, walnut, and elm burlwood veneer on drawers and doors, and elaborate marquetry of walnut, holly and mahogany

Photo courtesy The Metropolitan Museum of Art, Rogers Fund, 1931

suspect that they may be the result of a virus infection. In any event, burls are known to produce beautifully grained and colored wood much prized for fine furniture, pipes, gunstocks, bowls, candlesticks, carvings, various novelties, and objects of art.

That the nature and beauty of burlwood have been long appreciated by man is evidenced by the fact that such wood was widely used for toggles and amulets in ancient China, and for fine furniture by the early civilizations of the Mediterranean.

Burlwood More Valuable Than Gold

Thuya is the burlwood that is mentioned most frequently in the early literature on this subject. It is formed on the roots of the sandarac tree (*Tetraclinis articulata*), which is indigenous to the Atlas Mountains of Morocco and Algeria. This is the famous thyrine tree that yielded an incense used by priests of ancient times; then the wood was valued more highly than gold.

According to Malcolm H. Sherwood, author of *From Forest to Furniture, Athenian* and Roman men had two great ambitions: to become a dictator, and to own a thuya burl table. However, possession of such a table seems to have had a disrupting influence on otherwise happy families. When husbands chided their wives, for extravagance in jewels, the wives pointed indignant fingers at their lords' expensive furniture. It is said, for example, that Cicero owned "one thyrine burl table" for which he paid "300,000 denarii," roughly equivalent to \$50,000.

Later, the master cabinetmakers of western Europe made extensive use of various burls, usually as hand-sawn decorative veneers for inlays, overlays, and to completely cover pieces of otherwise plain solid-wood furniture. Many fine examples of the work of these craftsmen are still in existence, especially furniture made from the fifteenth century on. Early American cabinetmakers also showed considerable flair for using burlwood to decorate their masterpieces.

Lest anyone get the mistaken idea that the use of burlwood in fine furniture is a lost art, or out of fashion, they need only visit the nearest furniture exhibit, such as the Furniture Mart in Chicago, and inspect the many contemporary designs that feature the decorative effects of burlwood and other figured



Fred Ihlenfeld (r.) and George Englerth of the Forest Products Lab, inspect burl that is starting to develop at the base of a sugar maple tree

Judy Kent, FPL employee, admires a coffee table made by Robert Maeglin from cross section of a 784-year-old redwood tree that is 38 inches in diameter



veneers. According to veneer mills that specialize in such items, the demand for fancy face veneers was never greater. Custom gunstock makers, too, report increasing purchases by sportsmen of walnut burl and other kinds of fancy stocks with which to upgrade their favorite "shootin' arns" to the tune of \$150 to \$175 each. If their wives upbraid them for their extravagance, they probably employ the same excuses Cicero did under equally trying circumstances.

In addition to the commercial producers of burl veneers, fine burl-decorated furniture, fancy gunstocks, gift shop novelties, and the like, a new element has entered this field. It is composed of wood hobbyists, wood collectors, and do-it-yourselfers. They have more leisure time than their fathers, more money, power tools, and well-equipped home workshops that would have made the master craftsmen of an earlier century green with envy. They number in the millions, and what they sometimes lack in technical knowledge and skill they make up in enthusiasm. One thing they have in common is a deep love and appreciation for fine woods, and a strong yen to use their own

hands in fashioning such woods into items of beauty and utility.

Some of these modern hobbyists specialize on burls and other highly figured wood formations—stumps, crotches, and the like. The novices among them invariably encounter problems in "curing" or drying burls. Due to their inherently wild and abnormal fiber structure, burls and other highly figured wood formations usually split and check very badly as they dry. That is one reason why, in modern commercial practice, burls, stumpwood, crotches, etc., are usually processed into thin veneer on huge veneer slicers. Craftsmen of earlier centuries hand-sawed their burls into veneer for much the same reason.

But this is of little help to the hobbyist who desires to fashion his burls into solid-wood items such as bowls, candlesticks, table tops, or perchance a gunstock. After some frustrating experience with split bowls and cracked table tops, he may seek the advice of a venerable local craftsman who employs some mysterious, centuries-old procedure that was passed clown to him by word of mouth. Frequently the method consists of steeping the burls in a vile-smelling brew of secret in-

gredients, soaking them in various oils, or burying them for several years in sawdust, in sphagnum moss, or in horse manure, sheep manure, or some equally fragrant organic waste.

Many such methods for seasoning burls and other difficult-to-dry woods have evolved through the years. However, the effectiveness of these methods is open to question. The people who use them do not keep the sort of records needed for a precise evaluation. To the extent that they prolong the seasoning process, or saturate the wood fibers with hygroscopic materials such as sugars or salt, some of these practices probably do tend to minimize splitting and checking. But the glowing claims of proponents of such methods are difficult to reconcile with the fact that their scrap piles are always so much larger than their supply of usable pieces.

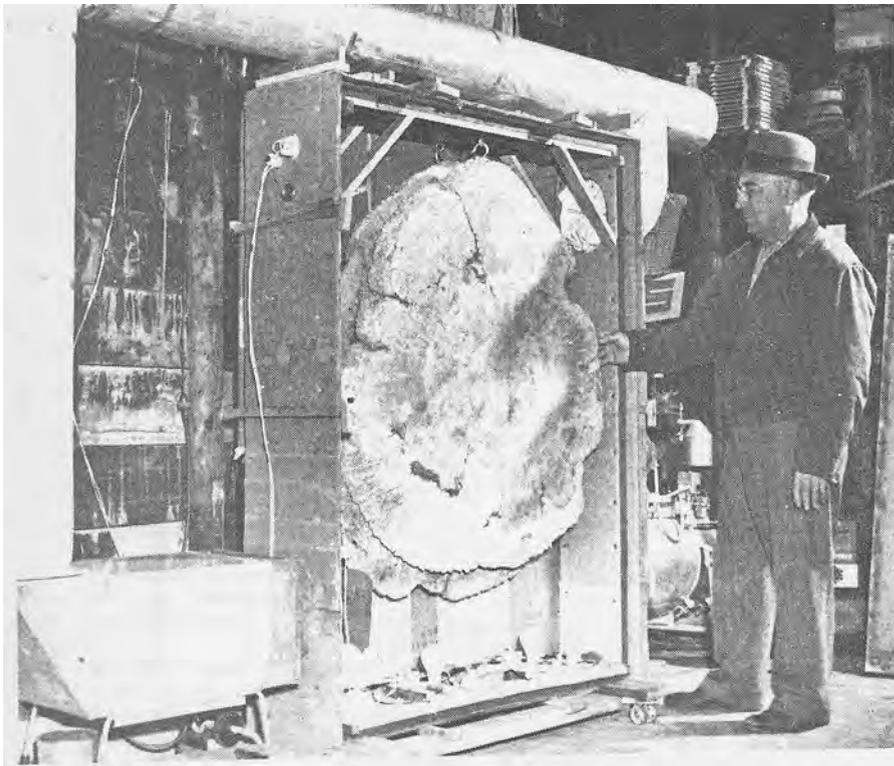
"PEG" Treatment Stabilizes Burls

However this may be, research has now developed a fast, clean, simple, and more effective method for protecting burls and other high-value, hard-to-season woods. It consists of soaking the green burl, or green-wood turnings, carvings, or cross sections made therefrom, in a water solution of polyethylene glycol-1000, or PEG for short.

In pioneering experiments at the U.S. Forest Products Laboratory, it was found that when freshly cut green wood is soaked for an appropriate period in a 30 to 50 percent (by weight) water solution of PEG, the wood does not shrink appreciably when dried. Equally important, wood thus treated and then dried swells very little when exposed again to high humidities. This stabilizing treatment attacks the problem at its very roots by bulking the microscopic, lattice-like wall structure of the individual wood fibers. Heavily treated wood is thus permanently restrained from shrinking, swelling, warping, splitting, or checking at any extreme of relative humidity. Even relatively light treatments, although they do not achieve a high level of dimensional stability, are normally sufficient to protect green wood against splitting and checking during the drying process.

Wood hobbyists in large numbers are now using this new method. It lends itself to home workshop application; it provides them with a fast, efficient method for taming burls and the other highly figured but hard-to-season woods they pre-

Fred Ihlenfeld demonstrates the home-made dry kiln in which he dried two king-size boxelder disks following stabilization with polyethylene glycol





Wood hobbyist George Englerth turning bowl from block of green scrap wood

fer to work with; and it permits the use of a great variety of green, scrap wood that is both plentiful and cheap.

Big Burl Treatment

Recently Mr. Fred Ihlenfeld, a retired construction worker who lives in Jefferson, Wisconsin, used PEG to properly season two exceptionally large and beautiful cross sections from a boxelder burl. Fred had a pact with his next-door neighbor that when the time came to cut down the old boxelder out front, the one with the large burl at the base, he would get the stump. So, when the day came last fall, Fred was ready with his crosscut saw. It took him three days to get what he wanted, two whole cross sections about three inches thick through the swollen butt.

Ihlenfeld wrapped the cross sections in moist burlap to keep them from splitting until he could get them in treatment. Using a piece of plywood and some scrap lumber, he constructed a soaking vat just large enough to accommodate one cross section at a time. Following directions obtained from the Forest Products Laboratory, Ihlenfeld mixed up sufficient 50 percent PEG solution to completely cover the cross section. Small stickers beneath provided free circulation of the liquid, weights kept the lighter-than-water disk immersed, and a lid

was added to minimize evaporation of water from the PEG solution. Several large light bulbs inverted in the solution kept its temperature 70° F. or above despite cool autumn nights.

Soaking was continued for 60 days, after which the first disk was removed and the second one put in treatment. Although the stabilized cross sections would have air dried, in time, by simply suspending them in his shop, this wasn't fast enough or "scientific" enough to suit Fred Ihlenfeld. So, being an inventive fellow who works real hard at his hobby, he designed and constructed a very ingenious home workshop dry kiln to season his burlwood.

This highly efficient, but inexpensive kiln was framed with scrap lumber and covered with two layers of fiberboard from discarded shipping cartons. Some old pipe formed the duct system, through which air was circulated by a small electric fan. Light bulbs, thermostatically controlled, provided heat. A household dehumidifier was built into the system, and simple vents (jelly jar covers) controlled removal of moisture-laden air as the wood dried. A dime-store hygrometer completed the instrumentation.

The drying process was started with a fairly low temperature and high humidity. Over a period of three months the temperature inside the kiln was gradually increased and the humidity decreased until the moisture content of the cross sections reached the desired six percent moisture content. They came out flawless—absolutely free of splits and checks. Moreover, thanks to the stabilization treatment, they will stay that way regardless of fluctuation in atmospheric humidity and temperature.

When the first cross section was adequately dried, Ihlenfeld hand-planed and sanded it smooth, and applied several coats of the recommended polyurethane varnish. The finish deepened and enriched the warm color tones that range from yellow, with traces of pink, through various shades of brown. In texture and design, the surface resembles fine, highly polished marble.

When completed, Ihlenfeld brought one 80-pound section to Madison, where it was built into a table and placed on display in the lobby of the Forest Products Laboratory. The other is being exhibited locally in a case built of 28 species of Wisconsin woods.

I am sure that Fred Ihlenfeld is every bit as proud of his homemade

boxelder burl table as Cicero was of his "300,000-denarii" masterpiece. And I firmly believe that Ihlenfeld's handiwork is just as beautiful as any thyme-burl job that graced a home in ancient Greece or Rome.

Backyard Supply

In this connection, it should be pointed out that the majority of amateur burl-hunters overlook a wealth of fine raw material right in their own back yards. Most any sizable woodlot will have a few decrepit, burl-infested trees that the owner will be glad to give you just to get rid of them. The species is unimportant, except for certain uses such as pipes that have special property requirements. The maples, oaks, elms, hickories, and other common species produce burls that are just as individualized, distinctive, and beautiful as such "name" burls as myrtlewood, manzanita, madrone, redwood, rhododendron, ceanothus, and, yes, thynel

Wood hobbyists who specialize in making candlesticks, bowls, turnings, carvings, and other small items from burlwood can also use polyethylene glycol to advantage in producing flawless products. The burls should be kept moist, preferably immersed in water, until needed. Next, turn, shape, or carve the green burlwood to the desired shape. Then stabilize with PEG, air dry, sand, and finish.

The length of the soaking period in the PEG solution will depend upon the size and shape of the item treated, the temperature of the solution, and the species of wood. How-to-do-it literature is available upon request from the Forest Products Laboratory.

The same treatment is equally effective in the seasoning of cross sections of logs and limewood, both figured and straight-grained. A variety of attractive and useful craft items can be made by hobbyists from stabilized disks of most any size or species.

Or, as in the time of Cicero, anyone with a few spare denarii in his jeans can readily satisfy his desire for fine commercial burlwood products. About the only important change through the centuries has been an improvement in the variety and quality of burlwood items on the market, and a downward trend in relative cost.

Any number of wood hobbyists could be coaxed into making you a beautiful solid-burl table for a lot less than the \$50,000 Cicero lavished on his. ■