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## TRIBUTE TO THE TREE

by John M. Haller

Mens' lives and trees' lives are inextricably intertwined. However artificially we may live, we depend on trees directly or indirectly for our existence, today quite as much as fifty or one hundred thousand years ago.

Our material needs are often listed as food, clothing, and shelter. From the beginning trees have provided us in some measure with all three. The hungry savage shook fruits and nuts from the tree's generous boughs. The cold, wet, and trembling savage covered himself with leafy branches and learned in time to make cloth, as the Polynesians still do today, out of the fibers of the inner bark. The fearful and defenseless savage climbed trees to escape the beasts that stalked him and learned to build simple shelters of trunks and poles and sticks.

Apart from supplying our necessities, trees gave us our arts and sciences. The first explorer floated down some unknown river astride a log. Many thousands of years later with Nina, Pinta, and Santa Maria—wood from mast to keel—crossed an unknown sea. War made little progress until some primitive genius fashioned a bow out of a stout ash limb, an arrow from a mulberry, and a spear from a straight oak sapling. The first catapult was a young tree, bent over and suddenly released—this simple device marking the birth of engineering, which, along wooden ways, developed the tower, the drawbridge, the portcullis, the battering ram, and the mangonel.

The first wheel was a log across which something was accidentally dragged. The huge stones of the Pyramids were moved over a series of logs which rolled under the burden. Progress from the use of the whole log to merely sections of it connected by an axle (itself a slenderer log) was inevitable once the convenience and efficien-

cy of rolling had become established. But had not the *idea* of the wheel been furnished by nature when she caused tree trunks to assume a cylindrical rather than a rectangular or triangular form, how long would we have to wait for its invention?

As with the wheel, so with the shaft. The column or pillar is the simplest, strongest, most natural, and most widely used of all building forms; yet had there been no trees, how many years would man have struggled toward the idea of an edifice mounted upon, or hung from, pillars? How simple for a primitive man to select four trees forming a rough square and to build his house around them! How natural to develop the primordial post into the Corinthian pillar (its ornamental cap a symbolic reduction of the tree's crown) and to rear the chiefest glory of architecture—the Parthenon—as an imitation and adaptation of a forest of straight-trunked trees!

Important as these inventions and discoveries were, they were overshadowed by one still greater. This was *fire*. When men first learned that wood would burn, progress took a gargantuan leap forward. Everything really important dates from that momentous discovery. Our atom bombs, our cyclotrons, our analogue digital computers, our space ships, all exist because wood burns and heated water turns into steam.

Daily we find new uses for trees: medicinal, dietetic, structural, ornamental, ecological. Leaves, bark, fruit, seeds, roots, wood—all contribute to our welfare. Under the microscope and in the test-tube the cellulose molecule is yielding up its secrets. The complexity of this molecule endows it with extraordinary versatility. So many apparently unrelated things can be made from wood that the Germans call it *das Universalrohstoff*—the universal raw material from which anything

else—from bacon to chocolate candy—can be made as needed.

Trees are the first objects to catch the eye in any setting. Where grasses are trodden underfoot and bushes brushed aside, trees stand squarely in the way and obtrude themselves on the attention. Like mountains and rivers they are primary features of the landscape and must be dealt with, whether we will or not. Trees determine the value of property, make this lot of no account, that one highly desirable. They dictate the location of buildings and divide people into social strata.

For primitives the world over, trees have a special meaning. Among the Druids they were worshipped directly. In Prussia whole groves were set aside as sacred. In Greece each tree had its particular guardian spirit or dryad. The alphabet of the early Britons was derived in part from trees, based on their successional leafing and flowering and is intricately related with the signs of the zodiac.

In many parts of the world even today certain trees are sacred and may be felled only after propitiatory rites. At the birth of a child some tribes plant a tree, believing the lives of the infant and the tree thenceforward indissolubly joined. Arabs believe sacred trees to be haunted by angels or by *jinn*. Among some of the Dravidians men and women are married to trees for the purpose of homeopathically insuring fertility. The Andamese, Indonesians, and Gonds of Bengal bury their honored dead among the branches of a tree.

Particularly large or long-lived trees make a strong impression on the human mind. The oaks were sacred to the Druids, the cypress to the Toltecs and Aztecs, the baobab to the Africans, the ginkgo to the Chinese and Japanese, the Sequoias to the North American Indians. Aristotle and Plutarch, among many others, believed trees sentient beings, endowed with perceptions, emotions, and even reason. One of the great books of our time, Sir James Frazer's *The Golden Bough*, concerns itself in large part with tree-beliefs and tree-rituals.

The folklore of all nations is closely bound up with trees. "As the twig is bent, so grows the tree." *Del arbol caido todos quieren hacer lena. El*

*que a buen arbol se arrima, buena sombra le cobija. Grau ist alle Theorie, grun allein des Lebens goldener Baum. Entre l'ecorce y l'arbre il ne faut pas mettre le doigt.* Literature has long used the tree to point a moral or adorn a tale. "Do not expect to get figs from thistles," wrote the homilist. "The tree of knowledge and the tree of life are one and the same," wrote Brandes (of Goethe). "The axe will be laid to the root of the tree." (Old English.) The tree has even made its way into the titles of books and movies; thus we have "A Tree Grows in Brooklyn," "Tap Roots," "The Greening of America," and, most recently, "Roots."

Trees interpenetrate man's consciousness on all levels. His thinking is in part conditioned by them; his whole psychology is colored by a faint arboreal tinge. Men cannot write or talk without sooner or later drawing on trees for imagery. We speak of growing like a tree, being sturdy as an oak, sinking one's roots deep down in the soil, bending to the wind, withstanding the storm, drawing the lightning. Many words and expressions that came into being to describe trees have become a part of the common language, used daily without thought of their origin. We speak of the *ramifications* of an industry, the *fructification* of a process, the *durability*\* of things, the *budding* of ideas, the *grafting* of one process upon another, the *branching out* into new activities. A hundred years of slang has found us *up a tree* when harassed by circumstance; late usage puts us *out on a limb*. When we are mistaken, we *bark up the wrong tree*; when successful after a long search, we have *treed our prey*. We use the compounds *axle-tree*, *gallows-tree*, *boat-tree*, *shoe-tree*, *saddle-tree*, *whipple-tree*, *swingle-tree*. We borrow kingly epithets to call large trees "monarchs of the forest" and repay the loan by representing the genealogies of royal houses in the form of *family trees*.

The overall design of a tree, tapering from large to small and repeatedly ramifying, is a vast subject in itself. Ramification, or bifurcation, is one of nature's favorite patterns. River systems branch in characteristic tree-like fashion. Electrical discharges often follow the tree form. Brittle solids crack in such a way that when examined under a

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\*Related to the greek root meaning oak tree.

microscope they exhibit striking tree-like pattern. Indeed, we find it convenient to represent all subdividing or bifurcating processes under the form of trees; probably no abstract diagram is so often drawn as that of a many-branching tree with a single trunk. Medieval and Renaissance philosophers, obsessed with analogies, applied the concept of the "binary tree" to dozens of apparently unrelated fields; even today the principle of dichotomous division, by means of which categories are split into mutually exclusive and exhaustive parts, is alive and fruitful. Mathematicians find tree graphs valuable aids in the solution of combinatorial problems in such diverse areas as electrical networks, chemical structure, game strategy, biological evolution, operations research, and probability theory.

Artists have long found repose and inspiration in the cathedral aisles of forests; some of the world's great poetry is tree-derived.

The groves were God's first temples. Ere  
man learned

To hew the shaft and lay the architrave  
And spread the roof above them . . . in the  
darkling wood

Amid the cool and silence, he knelt down  
And offered to the Mightiest solemn  
thanks and supplication.

The memory of certain trees is forever preserved by their connection with historical events, authentic or apocraphal. Judas hanged himself from a redbud (still called the "Judas-tree"); Cuauhtemoc was hanged from the limb of a silk-cotton tree (*ceiba*). Cortes, repulsed by the Aztecs, wept under a baldcypress (*ahuehuete*), since then called "The Tree of the Sad Night."\* Buddha sat contemplating under a bo-tree when struck with the lightning of his religious vision. Bows made of English yew helped decide the bat-

ties of Crecy and Poitiers, as the oak helped the English navy to greatness. The cedars of Lebanon played their part in many a naval victory. Don Diniz postponed Portugal's exploration of the world until his newly planted stand of pines could grow to usable size. San Antonio's Fort Alamo was so called because of the thick stand of cottonwoods (*alamos* in Spanish) growing there. The Virginian colonists at Hartford hid their charter in the hollow of an oak. Napoleon sat out long hours of his dreary exile under the shade of a weeping willow, and the author of the 137th Psalm hung his discarded harp among the willow's boughs.

Could we survive without trees? Attempts to establish a station on the treeless, airless, waterless moon will give us an idea of the difficulties involved. For the many millions who dwell in cities and have never seen a forest, whose concept of height derives from skyscrapers and whose only jungle is the asphalt jungle, to live without trees may seem easy, even natural. Yet the forest, like the sea, surrounds us and pervades us; although we no longer live in the green mansions which are our birthright, we remain connected with them by invisible and unbreakable ties. Precisely now, at the zenith of our power, with the future opening before us with unprecedented brilliance, circumstances are forcing us to relearn the stern lesson that we are not so much the master of nature as an integral part of her—the keystone of the edifice perhaps but dependent, like the stone, on all the other components of the structure, and to remember that, should they fall, we fall with them.

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\*This tree is still standing in Mexico City.