THE KENTUCKY COFFEETREE

By William C. Johnstone*

On March 8, 1976, Governor Julian M. Carroll signed Senate Bill 150, designating the Kentucky coffeetree *(Gymnocladus dioicus* [L.] K. Koch)[1] the Kentucky state tree. In signing the bill, Governor Carroll paid special tribute to the late Joe Creason, former columnist of *The Courier-Journal,* who first proposed the Kentucky coffeetree as the state's official tree and campaigned for it in the 1974 Legislature. Mr. Creason contended that it was an ideal tree for the purpose because, along with other desirable features, it is the only tree in the world with the word "Kentucky" in its accepted common name.

There are no set rules for selecting a state tree. It need not be the most abundant, the most valuable, or the most beautiful tree in the state. Logically, it should have some historical connection with the state and some characteristics which make it distinct from other state trees. The Kentucky coffeetree amply fulfills those qualifications. It is a remarkable tree—remarkable both historically and botanically—but remarkable mostly because it was so well known by early settlers and is so little known by present-day Kentuckians.

Two early written references to the tree are those by General George Rogers Clark and historian John Filson. In a letter dated October 12, 1783 to Thomas Jefferson, Clark wrote: "You will receive a few seed of what the Kentuckyns call s[ai]d Coffee Tree[.] It makes a beautiful shade and I believe will flourish with you"[.][2]

A year later, in 1784, John Filson published the first history of Kentucky. In his discussion on the trees of the new frontier, he mentions first, "the sugar tree that furnishes every family with plenty of excellent sugar," and, second, "the honey locust that makes excellent beer." Then he says, "The coffeetree greatly resembles the black oak, grows large and also bears a pod, in which

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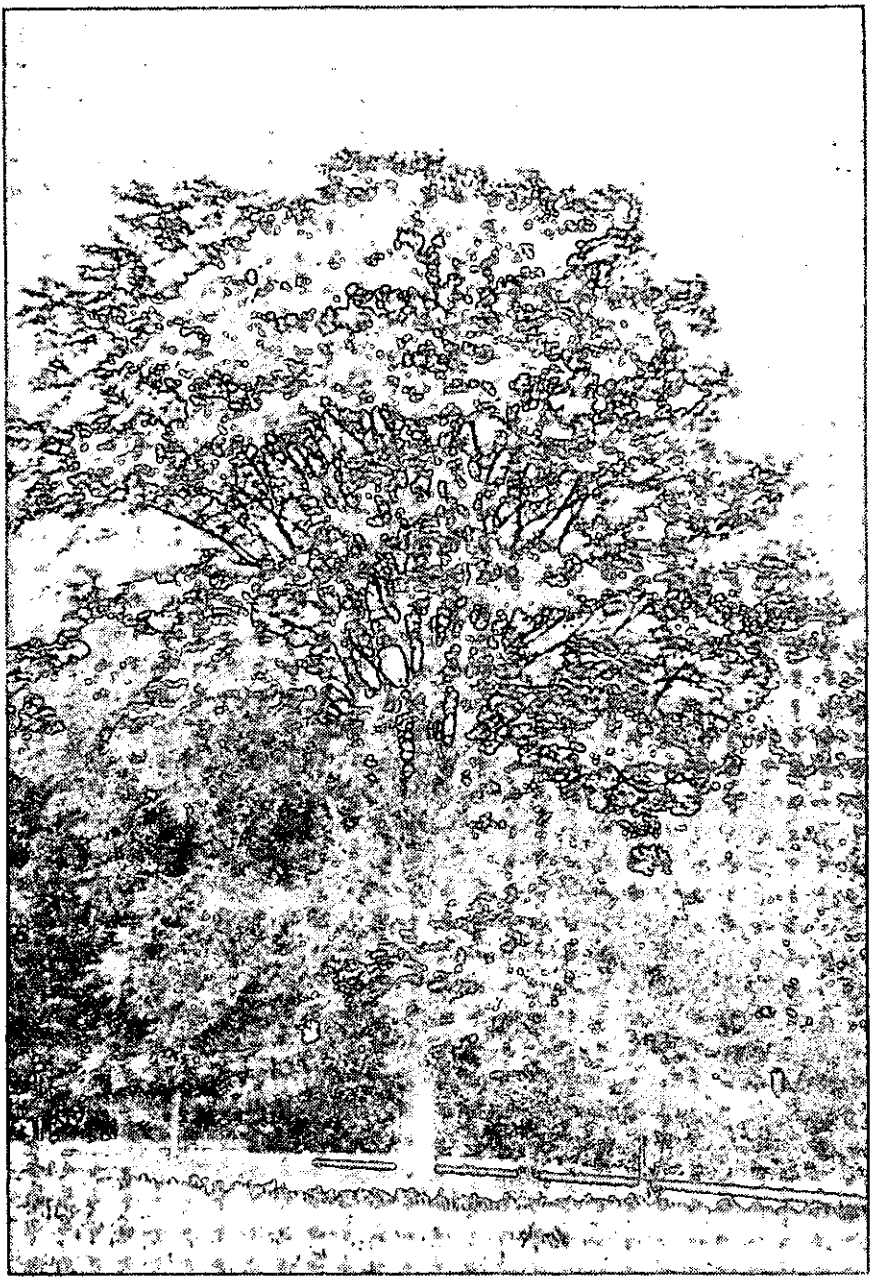
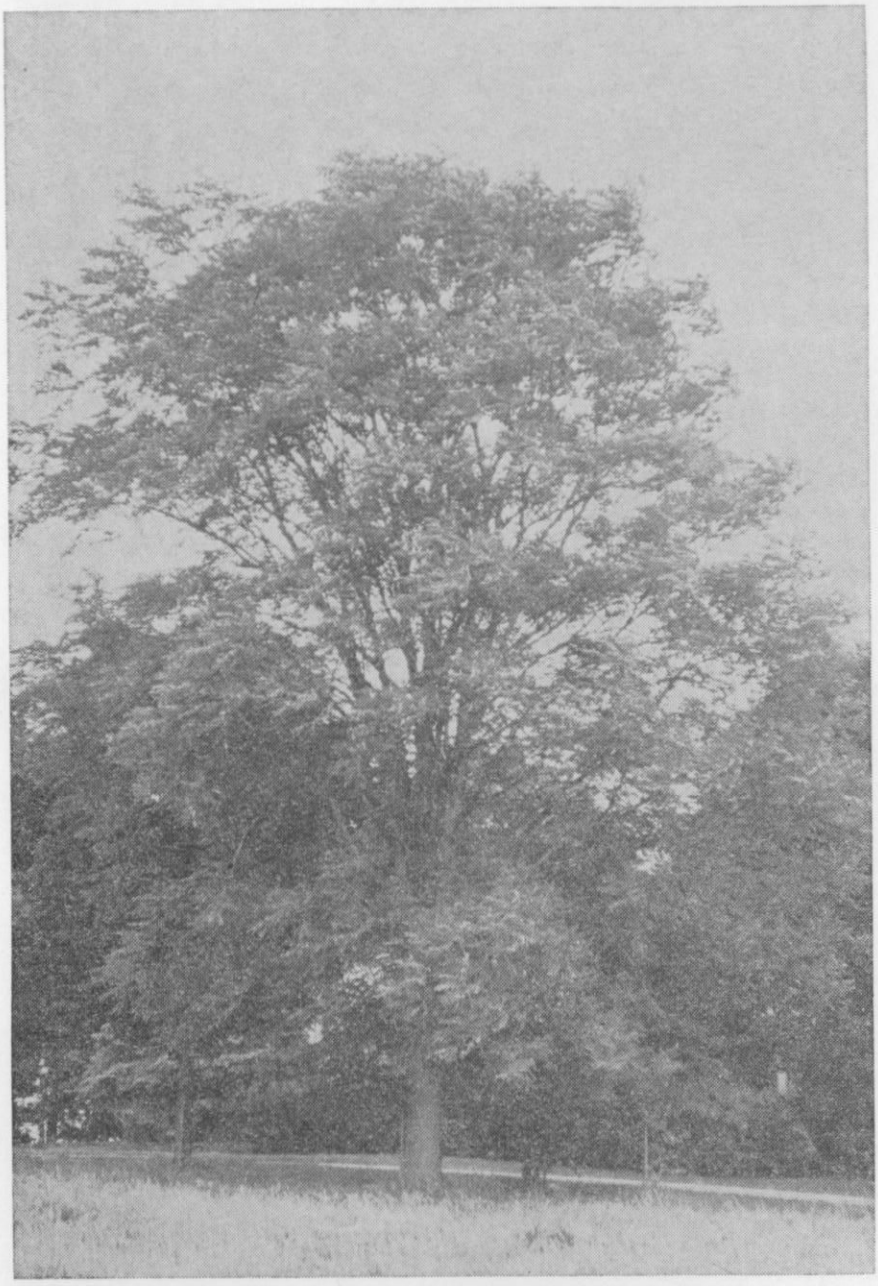
[1] Ellwood S. Harrar and J. George Harrar, *Guide to Southern Trees* (2nd edition; New York: Dover Publications Inc., 1962). p. 363.

[2] Quoted by Samuel W. Thomas and Eugene H. Conner, "George Rogers Clark (1752-1818): Natural Scientist and Historian," *The Filson Club History Quarterly,* 41 (July, 1967), p. 218.



A Fifty Year Old Kentucky Coffeetree Near Princeton



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is enclosed good coffee."[3] Dr. Willard R. Jillson wrote: "The Kentucky coffeetree to which reference is made, is *Gymnacladus dioicus*, . . . The ripe seed, though hard to crush, was used during the American Revolution as a substitute for genuine coffee."[4]

The tree is very adaptable, both as to soil requirements and climate. Its present range of growth is described as being a heart-shaped area extending from southern Minnesota to central New York, then southwesterly through Pennsylvania and the Atlantic states to the northern parts of Alabama, Mississippi, and Louisiana, then back to Minnesota through eastern Oklahoma, Kansas, and Nebraska, with Kentucky just about in the center of the area. Actually, it is growing, at least for landscaping purposes, over a much larger area. Kentucky coffeetrees are found wild mostly around old home sites, in fence rows, in river bottoms, and on rocky cliffs bordering rivers and creeks. In Kentucky, they are most prevalent in the central Bluegrass and in the lower Kentucky and Green River watersheds. Isolated trees have been found in every part of the state and in almost every county. Large groves of Kentucky coffeetrees, or forest areas where they dominate, simply do not exist. In fact, the trees are so rare that coffeetree logs seldom reach the market, and when they do, they are usually sold as oak or ash, which its wood resembles.

The wood of the Kentucky coffeetree is very hard and strong. It bends and splits easily, but is difficult to break. When it was more plentiful, it was used for tobacco sticks, railroad ties, and posts. More recently it has been used by woodworkers for gavels, lamps, and carvings. It is easily stained, if desired, and takes a nice finish. The sapwood is narrow and the bark adheres tightly to the wood, making it useful for articles in which the heartwood, sapwood, and bark may be combined. The adaptability for woodworking and gadgetmaking will enhance its value as a state tree by providing articles suitable for the tourist trade.

It is as an ornamental, shade, or specimen tree that our new state tree is most prized. In *Trees, Yearbook of Agriculture, 1949*, under "City Trees," it is recognized "as offering great possibilities for more extensive use."[5] It is recommended as an outstanding decidu-

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[3] John Filson, *The Discovery, Settlement, and Present State of Kentucke*, (Louisville: John P. Morton Company, 1930), p. 23. This is a facsimile reproduction of the original Wilmington 1784 edition with a bibliography and a sketch of Filson's life by Willard Rouse Jillson.

[4] *Ibid.*, pp. 125-26.

[5] *Trees, Yearbook of Agriculture, 1949*, U.S. Department of Agriculture (U.S. Government Printing Office, Washington, D.C.), p. 47.

ous shade tree for residential and suburban sections, primarily because of its tolerance of city conditions.

There was a belief, still remembered by older Kentuckians with farm background, that Kentucky coffeetree leaves contain ingredients poisonous or repellent to insects—especially flies. It was one of the children's daily chores to gather a few leaves and use them as instructed. Some people crushed the stems, sprinkled sugar on them, and used them as a poison. Others simply put the leaves in water and placed them around the house and milksheds as fly repellents.

There may be some justification for this practice. In 1974 Joe Creason wrote:

> For a number of years Dr. C. Harry Jarboe, Professor of Pharmacology, U. of L. Medical School, has conducted experiments on the toxicity of the beans and bark of the Kentucky Coffeetree. He found little toxic effect from the raw beans (and none when they were roasted), but he learned that the extract from the bark is very toxic. He applied for and received a grant to pursue his experiments. Since then he has found that the extract from the bark does some remarkable things to the heart and blood pressure of animals. That's as far as his experiments have gone and there are, of course, many things to be proved before any medicinal value could be claimed for the bark of the tree.[6]

Dr. Jarboe is still enthusiastic about the possibilities, but lacks money to continue his research.

This brings us to a question that was debated in the General Assembly when the Kentucky coffeetree was being considered for the state tree: Is it poisonous to livestock and, if so, how serious is this factor? It is listed as poisonous in several publications, along with the more common wild cherry, black locust, buckeye, oaks, and common shrubs such as yew, rhododendron, and mountain laurel. Some authorities say that poisoning is most likely to occur in "late winter or early spring when other forage is scarce and animals eat quantities of the pods and seed . . . or nibble on young shoots."[7] This is a situation hard to visualize in view of the scarcity of the trees. From a practical standpoint, the wilted foliage of the wild cherry is much more dangerous to livestock than Kentucky coffeetrees.

Botanically, the Kentucky coffeetree belongs to the important legume family which includes such plants as peas and beans, al-

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[6] *The Louisville Courier-Journal*, February 6, 1974, Joe Creason's column.

[7] J. W. Herron and D. E. LaBore, *Some Plants of Kentucky Poisonous to Livestock* (Lexington, Ky.: University of Kentucky, College of Agriculture, Cooperative Extension Service, issued 1953, revised 1972), p. 53.

falfa, clover, peanuts, and other plants that bear their seed in pods and have the power of utilizing nitrogen from the air through nitrofying bacteria that grow on their roots. In this legume family there are only two species of the genus *Gymnocladus;* one is "dioicus," our Kentucky coffeetree, and the other is "chinensis," commonly called the Chinese soaptree because women in central China, its natural habitat, use the soapy material in the pods surrounding the seed as a cleansing agent. A similar soapy substance is found in the pods of "dioicus," and records show that it, too, has been used for the same purpose in this country.

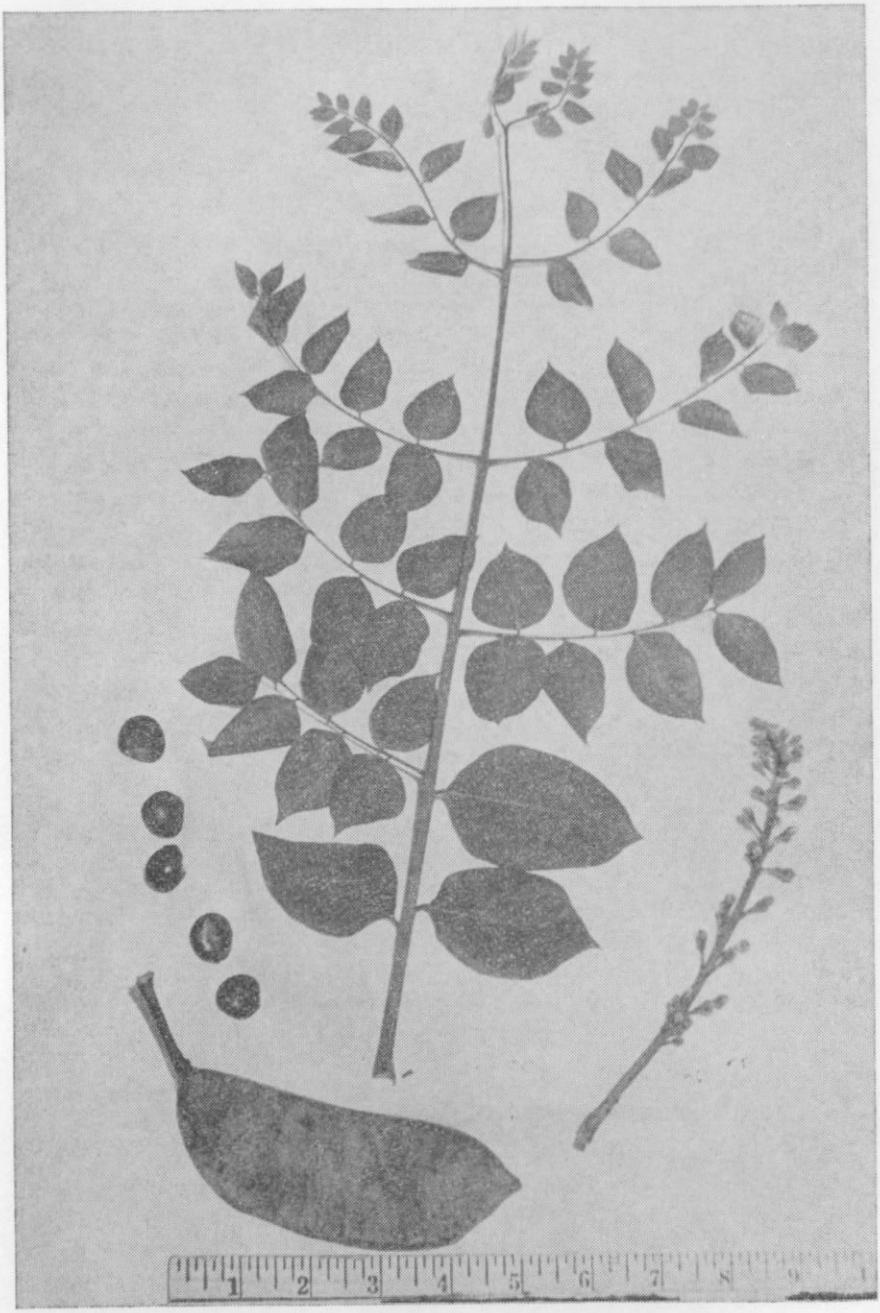
The technical name *Gymnocladus dioicus* literally means "the tree with naked branches that bears its male and female flowers on separate trees." In using the common name "Kentucky coffeetree" the word "Kentucky" should always be included because the simple name "coffeetree" refers to the tropical plant that produces commercial coffee.

It is difficult to describe the shape of the tree because it varies with the conditions under which it grows. In the open, it will reach a height of a hundred feet or more, a trunk fifteen feet in circumference, and a limb spread of nearly seventy-five feet with a globular shape. The limbs have an ascending tendency and often form narrow crotches. These narrow crotches provide one of the weaknesses of the tree in that it has a tendency to split at the junctions. In the forest the tree grows tall and slender, often developing clear boles forty to fifty feet long.

The foliage of the tree is one of its most attractive and characteristic features. The leaves are twice pinnate, meaning that each leaf is composed of a main stem (or pinna) on either side of which are from five to thirteen side stems (pinnae), each with six to fourteen very thin, delicate leaflets about one by two inches in size. The entire leaf, composed of pinnae and leaflets, may reach a width of three feet and a length of four feet, although they ordinarily are about fifteen inches wide and twenty-four inches long, making them the largest leaves of any tree in the state.

In the spring, the trees are late to break bud, but once started the leaves grow fast and during the summer cast an airy shade, especially suited for understory shrubs and leisurely rest. In early autumn, the foliage turns a delicate yellow, remaining colorful for a few days before the leaflets fall, leaving the stems, or pinnae, on the tree for a few more days. During this period the trees appear to be covered with tiny skeletons or giant spider webs. The leaflets are so delicate that they filter into the turf as they fall

Counterclockwise from bottom: Pod, Flower Stem, Leave, Seeds



Counterclockwise from bottom: Pod, Flower Stem, Leave, Seeds

and need little or no raking. The stems are easily raked if a clean lawn is desired.

One of the most interesting (and also debatable) features of the Kentucky coffeetree is its seed pods. Because the pistillate (female) and the staminate (male) flowers are borne on different trees, the fruit, or pods, are found only on the pistillate trees. It is necessary, of course, for a staminate tree to be in the vicinity to assure pollination of the female flowers and production of pods and seeds. The pods are four to ten inches long and about two inches wide. They contain from one to eight very hard, dark brown seeds about ½ to ¾ inches in diameter. The pods remain attached to the tree all winter, often not dropping until late March or April. It is this feature of the pistillate tree that gives rise to the argument as to whether the female tree is "beautiful" or "dirty." Many people prefer the pistillate tree. They like the unusual appearance of the large pods on the thick stubby branches during the winter. On the other hand, other persons do not like to rake the pods amid other springtime chores and prefer the non-seed-producing males.

The question is often asked how one can be assured of getting either a male or a female tree when the seeds or seedlings are planted. There is no way except by planting a tree reproduced asexually, that is by a cutting or from a graft. The trees reproduce easily from root cuttings and if one severs the roots of a male tree, for instance, it will sprout male trees and the same is true of the female tree. If the demand grows for plants of known sex, the progressive nurseryman will soon be supplying the trade with asexually produced plants such as is now being done with the American holly, for example. Both the male and female trees produce flowers, but neither of them is colorful and are seldom noticed. They are of interest, however, to those who like the study of plants and the intricacies of nature.

The bark of the Kentucky coffeetree is quite distinctive. It is dark gray to brown, not deeply furrowed but with hard, sharp, scaly ridges somewhat resembling an old cherry tree. It adheres to the wood very closely.

The trees are deep-rooted and do not lift sidewalks and roadways as do shallow-rooted species such as maples and elms. It is easy to grow grass and shrubs under them. One of the assets of the trees is the ease of growing the plants from seed, which has led to the custom of giving the seeds, as a friendly gesture, from one person to another. The seed coverings are so hard, though, that they must be specially treated before planting. The recom-

mended treatment for small quantities is to cut a notch through the hull with a file or knife. Larger quantities are soaked in concentrated sulphuric acid for four hours or more. Unless treated, some may not germinate for four or five years. When dormant, the seedlings can be transplanted easily, but the roots should not be disturbed during the growing season. An important feature of the tree is its freedom from disease and insects and its resistance to low temperatures, air pollution, droughts, and other adverse conditions.

There are many nice specimens of the Kentucky coffeetree in prominent places in Kentucky. The most noteworthy is the one standing just a few feet in front of Whitehall, the historic home of Cassius Marcellus Clay, near Richmond. The tree, measured in 1974, was sixty-eight feet high, 15.7 feet in circumference, with a limb-spread of sixty-six feet. A picture of Mr. Clay standing under the tree in 1894 when he was eighty-four,[8] indicates that the tree is now well over one hundred and fifty years old, and it shows the signs of old age—a bad heart, broken limbs, and encroachment by trees of younger generations.

Other specimens of our state tree can be found throughout Kentucky. At Cave Hill Cemetery in Louisville at least two of their many specimens seem to be near one hundred feet in height and three feet in diameter. These old ones probably antedate the founding of the cemetery. A nice specimen, more globular in shape than most of them, stands near the log house at Locust Grove, the historic Louisville home of George Rogers Clark. There are others in and around Louisville. A young specimen is on the University of Louisville's Belknap campus, a few feet from Third Street. Bronze plaques on either side of it are inscribed: "In this year of Our Lord 1970 the citizens of Kentucky celebrate the 25th anniversary of the United Nations. Peace on Earth—Goodwill toward Men." The tree was the choice of Dr. George Brodschi, Director of the International Center.

Most appropriately, also, the trees selected for planting at Fort Harrod along the avenue leading from the park entrance to the Fort are Kentucky coffeetrees. They were planted during the restoration of the historic fort in the early 1930s. Others are at Audubon State Park (Henderson), "Ashland," home of Henry Clay, Spalding Hall (Bardstown), Bernheim Forest, and on the campuses of most Kentucky state colleges and universities.

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[8] Lowell H. Harrison, "The Lion of Whitehall," *American History Illustrated*, May 1969, pp. 16-17.

The publicity generated by naming it the state tree has brought to light many other specimens, some of which even the local people did not know existed. One tree, eighty-four feet high and thirteen feet in circumference with a sixty foot limb-spread, is near Hartford, Kentucky.[9] It is said to have been planted about one hundred years ago from seed given the ancestors of the present owners, Miss Louise Phipps and her brother, James Duke Phipps. A month after the bill naming the state tree was signed, a group of three was found in Hickman County, one of them a hundred feet tall and two feet in diameter. None was previously known in the county.

Outside of Kentucky there are many notable Kentucky coffeetrees. One of the largest on record, listed in the American Forestry Association's "Social Registry of Big Trees," is at Bryn Mawr, Pennsylvania. It was a hundred and one feet high and fourteen and a half feet in girth when measured in 1966. In the Gettysburg National Military Park there are two specimens just yards from where President Lincoln made his memorable address. Dr. Charles S. Sargent, for many years Professor of Aboriculture at Harvard and Director of the Arnold Arboretum, described a historic specimen in an article written in 1889. He said:

> It was by far the largest and handsomest I had seen. It stood directly in front of the Verplanck mansion at Fishkill-on-Hudson, occupied sometime by Baron Steuben during the Revolution and the scene of the first meeting of the Society of Cincinnati. This tree is now [1889] seventy-five feet high.[10]

In my research into the early history of the Kentucky coffeetree I have found many items of fact and folklore that render the story of our state tree even more interesting than anticipated. The tree was well known before the Long Hunters explored the territory that in 1792 became the Commonwealth of Kentucky. Undoubtedly the first trees of the genus in the new country were found by the early explorers around the Great Lakes and more specifically by the French on the Canadian side of Lake Erie and Lake Ontario. Early technical and common names usually had French or Canadian connotations. The first reference to the tree that I have found is in Dr. Sargent's book, *The Silva of North America*.[11] It was mentioned by Linnaeus, the great Swedish botanist, as growing in Paris in 1742.[12] When Linnaeus published his

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[9] *The Ohio County Times*, March 11, 1976. Front page story and photograph.
[10] Charles S. Sargent, "The Kentucky Coffeetree," *Garden and Forest*, 11 (1889), 75.
[11] Charles S. Sargent, *The Silva of North America* (14 vols.; Boston and New York, 1892), III, 70.

Species Plantarum in 1753, he mistakenly classified the tree as *Guilandia dioica,* putting it in the same genus as the tamarind tree of India and the mahogany of the West Indies.

According to Dr. Sargent, the tree was first described by Duhamel in his book, *Arbres,* published in Paris in 1775. He referred to it as "Bonduc of Plumier," and the description was accompanied by figures of a leaf and a male flower. Credit is given to the French botanist Lamarck (1744-1829) for establishing a new genus, *Gymnocladus,* for the tree in his *Encyclopedia Methodique* published in 1785. Unfortunately, at the same time, Lamarck changed the specific name from *dioica* to *Canadensis,* a change with which other botanists disagreed or questioned. At any rate, its technical name remained *Gymnocladus Canadensis* for almost a century, or until 1869, when Karl Koch (1809-1897), a German physician, plant explorer, and taxonomist (who traveled in Kentucky) published his *Dendrologie* and replaced *Canadensis* with *dioicus.* Since then the accepted name has been *Gymnocladus Dioicus (L.) Koch.*

Along with the changes taking place in the development of the scientific name, there have been many changes in the tree's common name. In the pre-Kentucky era it was known in various places and times as "hardy bondoc," "Canadian gymnoclade," "chicot," "stumptree," "nicker(ar)-tree," and other local names. "Stumptree" and "chicot" (which in French means "stump") refer to the absence of small twigs and branches or the "naked limb" appearance in the dormant period, as is signified by its generic name, *Gymnocladus.* Early explorers in Kentucky found the tree much more abundant than further north and, because they used the ground, roasted beans as a substitute for coffee, the tree acquired its present common name, "Kentucky coffeetree," which has been accepted worldwide.

A very complete discussion of the early history of our state tree is in the book, *Trees of America,* by D. J. Browne, one of America's foremost authorities on dendrology, and author of *Sylvia Americana.* At the time, well over one hundred years ago, his description of our state tree was as modern as if it had been prepared for the special consideration of the General Assembly! Dr. Browne says that the tree was introduced in Britain as early as 1748.[13] It was imported by the Duke of Argyll and planted at Whitton where it

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[12] Carl Linnaeus, *Genera Plantarum* (2nd ed., 1742), p. 518.
[13] D. J. Browne, *The Trees of America.* (New York: Harper & Brothers, 1857). pp. 217-219.

grew for over one hundred years. Incidentally, the Duke of Argyll presented a Kentucky coffeetree—then called Canadian Gymnoclade—to the reigning king, George III, in 1764 to be planted at Kew Garden, London.[14] At that time, the mid-1700s, there were specimens also in Paris, Berlin, Vienna, and other European cities.

Dr. Browne described the wood of the tree as "a rosy hue, very hard, compact, tough and strong, rendering it suitable for cabinet-making and building." He reported that the "live bark was extremely bitter; so that a morsel no larger than a grain of maize, chewed for some time, causes a violent irritation of the throat." He concluded by saying that: "In Europe, the only use for which the tree is applied is for the purposes of ornament and shade. Being very hardy, it is highly appreciated both in Europe and its native country."[15]

An interesting comment about the toxicity of the Kentucky coffeetree confirms my childhood recollections and those of other Kentuckians. Under the heading "Gymnocladus as a Fly-poison" a Virginia gentleman reported his experiences with the coffeetree as a fly-killer. He said:

> Back of our house here, and overhanging the piazza, is a very large coffeetree. Though this community is infested, like Egypt, with a plague of flies, we have never suffered any serious annoyance from them. One year this tree was nearly stripped of its leaves by a cloud of potato-flies (the blistering fly) and we feared the tree would die from complete defoliation. In three days, the ground beneath was black with a carpet of corpses and the tree put out new leaves and still flourishes. For ten years we have used the bruised leaves, sprinkled them with molasses water as a fly-poison. It attracts swarms of the noisome insects and is sure death to them.[16]

Another reference to the early history of the Kentucky coffeetree is by John T. Curtiss in his book entitled *The Vegetation of Wisconsin.* In his chapter on the "Effect of Man on Vegetation" he says:

> One interesting example is the Kentucky coffeetree *(Gymnocladus dioicus).* The large hard seeds of this species were used in a sort of dice game by various tribes [of Indians]. As a result, they were carried about when the tribe moved its headquarters, many becoming lost in the vicinity of the villages. At present the species has very local distribution in Wisconsin, with each locality at or near the site of an

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[14] "Gymnocladus Canadensis," *Gardening Illustrated* (London), July, 1884, p. 215.
[15] Browne, *Trees*, pp. 217-19.
[16] "The Gymnaclade is Fly-Poison," *Torrey Botanical Club*, 9 (1882), 130-31.

Indian village. Herrick (1933) reported the same type of distribution in New York state. [17]

This might explain, at least partially, the spotty distribution in Kentucky.

Kentuckians may well be proud of their new state tree. It typifies what we like to glorify in our state. It is strong and resistant, deep-rooted and straight grained, unique and colorful, durable and useful, and a tree that, because of its name and history, is not adapted to be the official tree of any other state. May we remember General Clark's admonition: "It makes a beautiful shade and I believe will flourish with you." Kentucky coffeetrees merit extensive planting at schools, state parks, along streets and highways, as well as on the lawns of our Kentucky homes.

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[17] John T. Curtiss, *The Vegetation of Wisconsin* (Madison: University of Wisconsin Press, 1959), p. 463.