

1976

Ethnically Important Woody Plants of East-Central Illinois

David Eric Brussell

Eastern Illinois University

This research is a product of the graduate program in [Botany](#) at Eastern Illinois University. [Find out more](#) about the program.

Recommended Citation

Brussell, David Eric, "Ethnically Important Woody Plants of East-Central Illinois" (1976). *Masters Theses*. 3389.
<https://thekeep.eiu.edu/theses/3389>

This is brought to you for free and open access by the Student Theses & Publications at The Keep. It has been accepted for inclusion in Masters Theses by an authorized administrator of The Keep. For more information, please contact tabruns@eiu.edu.

PAPER CERTIFICATE #2

TO: Graduate Degree Candidates who have written formal theses.

SUBJECT: Permission to reproduce theses.

The University Library is receiving a number of requests from other institutions asking permission to reproduce dissertations for inclusion in their library holdings. Although no copyright laws are involved, we feel that professional courtesy demands that permission be obtained from the author before we allow theses to be copied.

Please sign one of the following statements:

Booth Library of Eastern Illinois University has my permission to lend my thesis to a reputable college or university for the purpose of copying it for inclusion in that institution's library or research holdings.

Apr. 29 1976
Date

I respectfully request Booth Library of Eastern Illinois University not allow my thesis be reproduced because _____

Date

Author

ETHNICALLY IMPORTANT WOODY

PLANTS OF EAST-CENTRAL ILLINOIS

(TITLE)

BY

David Eric Brussell

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Science in Botany

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1976

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

April 29, 1976
DATE

DATE

"And what is a weed? A plant whose virtues have not been
discovered." Ralph Waldo Emerson

ACKNOWLEDGEMENTS

Sincere gratitude and appreciation is extended to my advisor Dr. Charles B. Arzeni who structured my interest in ethnobotany, helped me appreciate culture, and inspired me to do graduate work. Special thanks is also extended to Dr. Wesley C. Whiteside for his valuable help and judgements. Sincere thanks and appreciation go to Dr. Grant G. Gray for his assistance and suggestions and to Dr. U. Douglas Zimmerman for his advice and counsel. I would also like to thank Dr. John E. Ebinger for the taxonomic information that he provided.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	iv
LIST OF TABLES	v
LIST OF SPECIES BY FAMILIES	vi
INTRODUCTION	1
MAP OF THE AREA	7
MAP OF ORIGINAL FOREST AREAS	8
DISCUSSION OF THE SPECIES	9
GLOSSARY OF ETHNOBOTANICAL-MEDICAL TERMS	195
LITERATURE CITED	199

LIST OF FIGURES

Figure		Page
1	Wooded area where the sugar camp was set up	20
2	Large sugar maple tree with elderberry spile and sap collecting jug	21
3	Cast iron kettle and split red elm kindling shown during the first phase of sap boiling	22
4	The author ladling off impurities during the final phase of syrup making.	23

LIST OF TABLES

TABLE		Page
I	Nutritional Analysis of Nuts	97

LIST OF SPECIES BY FAMILIES

	Page
Aceraceae--The Maple Family	9
<u>Acer negundo</u> L. - Box Elder	9
<u>Acer rubrum</u> L. - Red Maple	12
<u>Acer saccharum</u> Marsh. - Sugar Maple	15
Anacardiaceae--The Sumac Family	24
<u>Rhus glabra</u> L. - Smooth Sumac	24
<u>Rhus radicans</u> L. - Poison Ivy	28
Annonaceae--Custard Apple Family	32
<u>Asimina triloba</u> (L.) Dunal - Pawpaw	32
Betulaceae--The Birch Family	35
<u>Betula nigra</u> L. - River Birch	35
<u>Corylus americana</u> Walt. - Hazelnut	38
Bignoniaceae--The Trumpet Creeper Family.	40
<u>Campsis radicans</u> (L.) Seem. - Trumpet Vine	40
<u>Catalpa speciosa</u> Warder - Catalpa	42
Caprifoliaceae--The Honeysuckle Family	44
<u>Sambucus canadensis</u> L. - Elderberry	44
<u>Viburnum prunifolium</u> L. - Blackhaw	47
Celastraceae--The Staff Tree Family	50
<u>Celastrus scandens</u> L. - Bittersweet	50
<u>Euonymus atropurpurea</u> Jacq. - Wahoo	54
Cornaceae--The Dogwood Family	57
<u>Cornus florida</u> (L.) Rof. - Dogwood.	57
Cupressaceae--The Juniper Family.	60
<u>Juniperus virginiana</u> L. - Red Cedar	60
Ebenaceae--Persimmon Family	63
<u>Diospyros virginiana</u> L. - Persimmon	63

Fagaceae--The Beech Family	66
<u>Fagus grandifolia</u> Ehrh. - American Beech	66
<u>Quercus alba</u> L. - White Oak	69
<u>Quercus macrocarpa</u> Michx. - Bur Oak	73
<u>Quercus muehlenbergii</u> Englem. - Chinquapin Oak	76
<u>Quercus rubra</u> L. - Red Oak	79
Grossulariaceae--The Gooseberry Family.	81
<u>Ribes missouriense</u> Nutt. - Wild Gooseberry	81
Hamamelidaceae--The Witch-Hazel Family	84
<u>Hamamelis virginiana</u> L. - Witch-Hazel.	84
Hippocastanaceae--The Horsechestnut Family	88
<u>Aesculus glabra</u> Willd. - Ohio Buckeye	88
Juglandaceae--The Walnut Family	91
<u>Carya cordiformis</u> (Wang.) K. Koch - Bitternut Hickory	91
<u>Carya illinoensis</u> (Wang.) K. Koch - Pecan	94
<u>Carya laciniosa</u> (Michx.) Loud. - Kingnut Hickory	98
<u>Carya ovata</u> (Mill.) K. Koch - Shagbark Hickory	101
<u>Juglans cinera</u> L. - Butternut	105
<u>Juglans nigra</u> L. - Black Walnut	108
Lauraceae--Laurel Family	111
<u>Lindera benzoin</u> (L.) Blume - Spicebush.	111
<u>Sassafras albidum</u> (Nutt.) Nees - Sassafras	114
Leguminosae--The Pea Family.	117
<u>Cercis canadensis</u> L. - Redbud	117
<u>Gleditsia triacanthos</u> L. - Honey Locust.	119
<u>Gymnocladus dioica</u> (L.) K. Koch - Kentucky Coffee-Tree	122
<u>Robinia pseudoacacia</u> L. - Black Locust.	124
Loranthaceae--Mistletoe Family	127
<u>Phoradendron flavescens</u> (Pursh) Nutt. - American Mistletoe	127
Magnoliaceae--Magnolia Family	131
<u>Liriodendron tulipifera</u> L. - Tulip Tree	131
Moraceae--The Mulberry Family.	134
<u>Maclura pomifera</u> (Raf.) Schneid. - Osage Orange	134
<u>Morus rubra</u> L. - Red Mulberry	134
Oleaceae--The Olive Family.	140
<u>Fraxinus americana</u> L. - White Ash	140

Platanaceae--The Plane Family	143
<u>Platanus occidentalis</u> L. - Sycamore	143
Rosaceae--The Rose Family	146
<u>Crataegus mollis</u> (T. & G.) Scheele - Red Haw	146
<u>Malus ioensis</u> (Wood) Britt - Wild Crabapple	149
<u>Prunus americana</u> Marsh - Wild Plum	151
<u>Prunus serotima</u> Ehrh. - Black Cherry	153
<u>Rosa carolina</u> L. - Pasture Rose	156
<u>Rubus flagellaris</u> Willd. - Dewberry	159
<u>Rubus occidentalis</u> L. - Black Raspberry	161
<u>Rubus ostryifolius</u> Rydb. - Wild Blackberry	164
Rutaceae--The Rue Family	167
<u>Ptelea trifoliata</u> L. - Hop Tree	167
Salicaceae--The Willow Family	170
<u>Populus deltoides</u> Marsh. - Cottonwood	170
<u>Salix discolor</u> Muhl. - Pussy Willow	173
<u>Salix nigra</u> Marsh. - Black Willow	176
Staphyleaceae--The Bladdernut Family	180
<u>Staphylea trifolia</u> L. - Bladdernut	180
Tiliaceae--The Linden Family	182
<u>Tilia americana</u> L. - Basswood	182
Ulmaceae--The Elm Family	185
<u>Ulmus rubra</u> Muhl. - Red Elm	185
<u>Celtis occidentalis</u> L. - Hackberry	188
Vitaceae--The Grape Family	190
<u>Vitis riparia</u> Michx. - Riverbank Grape	190

INTRODUCTION

Short of Aphrodite one would be hard pressed to find something in creation more beautiful than a flower and more useful than a plant. Ethnobotany is an encompassing field dealing with the many ways plants affect the life of man. Even though ethnobotany as a structured discipline is rather embryonic, the interrelations between plants and man are timeless. Since the very dawn of man's appearance on this planet, plants have been a source of food, shelter, and weapons. Man has always found beauty in plants and incorporated them in his art, rituals, and legends.

Humanity is still as dependent on plants as ever. Whether one is dealing with primitive man, classical civilizations, medieval cultures, or twentieth century living, ethnobotany is an equally fascinating and practical fusion of natural science and the humanities.

Two ancient civilizations which have had considerable influence on our present culture, namely the Greeks and the Egyptians, were highly aware of the properties and uses of plants. Vegetal designs and forms were used in their art and architecture. The Egyptians made columns that resembled the much esteemed papyrus plant and the stately columns of Greek architecture were first made of tree trunks

and later of stone, the idea being to capture the stately splendor of a forest glade in a man-made structure. Classical and baroque art incorporated extensive use of vegetal forms such as leaves and flower parts for scrollwork and trim on vases, furniture, carved panels, and manuscripts.

One need not look hard to find examples in our culture of how plants influence our lives and emotions. This brings to mind the deep feelings that are conveyed when a gift of flowers is given to a special person, the welcome excuse for amorous activity that couples find when under the mistletoe, and the joy that a fresh green Christmas tree smelling of cedar can bring.

Some authors have defined ethnobotany as the use of plants by primitive peoples. This definition is unreasonably limiting and leaves a colossal research area without account. It is more accurate to define ethnobotany as the study of the interrelations between plant and human populations. This discipline exceeds simple plant usages by including man's concepts about his vegetal environment and the effects of his actions upon it, intentional and otherwise.

Natural changes in the plant populations affect man, and man's impact on the environment affects plant populations. When studying an archeological site the ethnobotanist must gain an understanding of a given ecosystem. In order to gain this understanding one must determine what plants were present, the natural environmental factors

that affected the life cycle of each plant population, and the results of human exploitation during any stage in a life cycle. From ascertaining the nutritive value of the plant food sources and the amount needed by the human population one can get an overview of the geographical area of exploitation and also determine man's impact on plant populations. Information of this type is also useful for explaining changing patterns of human-plant coreactions over a period of time.

Early cultures discovered medicinal properties in certain plants and herbal medicine reached noteworthy heights in the civilizations of ancient Greece, Egypt, India, China, and among the Indians of the Americas. There is still much ethnobotanical information yet to be gathered from extant primitive tribes in areas such as South America, Africa, and the South Pacific. These peoples have learned by hundreds of years of trial and error which plants are useful for certain ailments, and it is quite probable that many valuable medicine sources are left untouched by modern science. It is the purpose of the ethnobotanist to record the plant usages of these peoples before this valuable knowledge is lost due to the encroachment of civilization. After these medicinal plants have been catalogued by the ethnobotanist it is the duty of the biochemist and physiologist to determine the actual properties of the plants in question.

Ethnobotany is concerned with preserving knowledge of ways by which man can obtain food, energy for warmth, medicine, dyes, cloth-

ing, and building materials from plants, i. e., natural sources. Perhaps these methods are not in vogue at present, perhaps they are not economically practical, in any case they should not be forgotten. We have a plethora of technological blind alleys, e. g., DDT, red dye number two, medicines with harmful side effects, slow decomposing detergents, and revolting artificial flavoring agents that are possible carcinogens (Ehrlich, 1976). Plant sources can provide safe, time-proven, natural alternatives for synthetics that are undesirable. It is very important to preserve this practical history of how man has used plants for his benefit. Some of these natural methods may prove to be superior in the long run from both the human and the environmental standpoint. There is something about artificial flavoring that leaves one with an unfulfilled desire. One need only compare the taste of artificial vanilla and true vanilla to realize this. The same is true of perfumes, soaps, and shampoos. Nature's scents are much more intriguing and satisfying than are harsh coal tar derivatives. The recent trend to a more natural lifestyle has been strongly reflected in consumer buying of these products.

The American Indians relied on wild plants for food, medicine, dyes, fiber, fuel, musical instruments, weapons, tools, shelter, and canoes. It was necessary for their survival to be adept at living off the land. In recent years backpacking and canoeing into wilderness areas has grown in popularity. Ultralight camping gear and dehydrated

foods has made it possible to journey farther, stay out longer, and carry less than before. Unfortunately many modern campers lack survival skills and are totally dependent on their pack contents. If a mishap occurs which separates such a person from his pack and food supply it could mean death by starvation even though there may be a plethora of edible plants that could be utilized. Just a rudimentary knowledge of common edible and poisonous plants will allow a person to live for quite some time in a survival situation. Even when survival is not at stake, a knowledge of food plants can save grocery bills and add many wild delicacies to a person's culinary repertoire. Knowledge of this division of ethnobotany would surely be valuable to nearly every person, for one cannot tell when an accident such as a forced plane landing in a remote area will leave one fending for oneself.

This thesis was written in order to compile ethnobotanical information of some of the common woody plants found in East-central Illinois so as to preserve the methods of use and properties of these plants and their incorporation into folklore and literature. The study includes sixty species found in a seven county area that includes Crawford, Jasper, Clark, Cumberland, Edgar, Coles, and Douglas counties. Medicinal and food uses of related species in the same genus or family were sometimes noted, as were methods of employment for these plants by other groups of people in other parts of the world. Plants of the same genus often have similar properties even though one species

may grow in the United States in a temperate zone, while a related species may grow in tropical India. This is one avenue of ethnobotanical investigation for finding additional sources of medicinal plants.

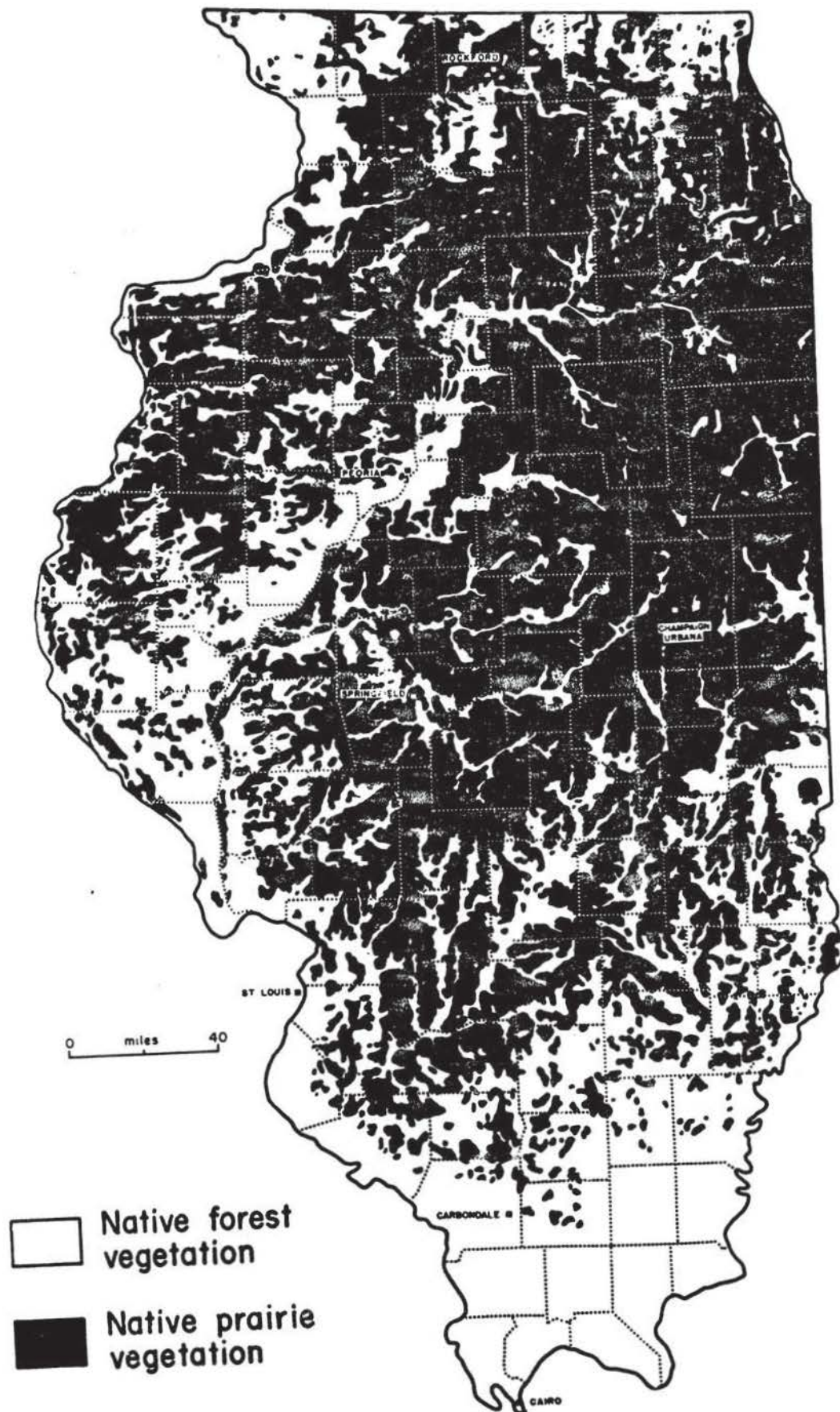
The medicinal information in this study is not intended to encourage people to bypass a doctor and treat themselves. Some of these remedies are unproven by modern science and should not be depended upon. The folklore aspects of these medicines is of interest from an ethnobotanical standpoint, and it is worthwhile to keep track of plant remedies used in cultures of the past. As was the case with Digitalis some of these plants may one day play an important role in modern medicine. I would suggest that further research be done on the biochemistry of the various plants used in folk medicine.

MAP - SHOWING THE FIVE COUNTY AREA



Indicates Crawford, Jasper, Clark, Cumberland, Edgar, Coles, and Douglas Counties; the area where the plants in this study have been reported.

MAP - NATIVE VEGETATION IN ILLINOIS



Native vegetation in Illinois. (Map courtesy of Roger C. Anderson.)

(Asch et al., 1972)

DISCUSSION OF THE SPECIES

Aceraceae--The Maple Family

Acer negundo L.

Folknames. --Box Elder, Ash Leaved Maple, Three-Leaved Maple, Sugar Ash, Manitoba Maple.

Habit. --Medium sized tree attaining a height of 20 meters usually with a short trunk and stout spreading branches forming a deep broad-topped crown.

Bark. --Pale gray to yellow brown, furrowed, scaly rounded ridges, thick.

Twigs. --Green or purplish, smooth, shiny, stout, often covered with a gray waxy substance, scattered raised lenticels; buds large, short stalked, ovoid, wooly, enclosed by 2 red outer scales; terminal bud 3-6 mm long, sharply pointed, lateral buds oppressed and bluntly pointed.

Leaves. --Deciduous. Opposite, pinnately compound, 20-30 cm long with 3-7 leaflets, leaflets ovate to oblong-lanceolate 6-10 cm long, 3-4 cm wide, sharply pointed at apex, wedge shaped at base,

toothed on margin above the middle, blade light yellow-green above, pale and slightly hairy below; slender petiole 6-8 cm long; each leaflet stalked.

Flowers. --Mid-April, as leaves unfold. Dioecious. Flowers developing from buds of the previous year, male flowers in drooping clusters of 5-15 on a short stem, each flower on a long stalk, broad calyx, funnel-shaped, yellow-green, hairy, 5 small lobes, petals absent, 5 stamens with long, slender filaments and large, reddish anthers. Female flowers short stalked, 5 sepals, elliptic, yellowish, hairy, no petals, green ovary, 2-lobed, usually hairy on the outer end, with 2 long, slender, yellowish, spreading stigmas.

Fruit. --July-August. A smooth key with wings diverging at an outer angle and usually incurved, 2.5-3.5 cm long with the nutlet borne in drooping racemes, nutlet thick and somewhat flattened.

Habitat. --Prefers moist deep soil along stream banks and borders of swamps, but will also grow in drier situations.

Ethnic Remarks. --Acer is the classical Latin name for the maple; negundo is an early name given to the plant. The box elder was formerly planted around farmsteads and it grows rapidly, but has a short life-span and is easily damaged by storms (Stephens, 1969).

The tree yields a sap that can be boiled down into a sweet syrup

that was popular with the American Indians and early settlers. The wood is not durable and decays easily so its use is mainly confined to firewood and boxes, hence its name "box elder." The large, low, spreading branches of this tree are ideal for building tree houses; and I have fond memories of a childhood hideaway that a friend and I built in a giant box elder tree along Range Creek in Cumberland County.

The Crow Indians made sugar from the sap of this tree. Box elder was extensively used for syrup production in central Canada. Early experiments demonstrated that the box elder produced more sap than any other maple. As is true with all sap-producing trees, a sunny day following a freezing night is best for collecting sap. The alternate cooling and warming causes the wood to contract and expand and thus drives the sap through the drainage holes (Weiner, 1972).

Acer rubrum L.

Folknames. --Red Maple, Scarlet Maple, White Maple, Water Maple, Soft Maple, Swamp Maple, Red Flower, Crable.

Habit. --A tree reaching a height of 40 meters with a short trunk and a dense broad-topped crown.

Bark. --Dark gray, thick, fissured into long ridges separated into platelike scales.

Twigs. --Green at first, becoming red, slender, flexible; buds dark red, bluntly pointed, scales rounded at apex, terminal bud 2-3 mm long; V-shaped leaf scars not encircling the stem.

Leaves. --Deciduous, simple, opposite, roundish ovate in outline with 3-5 lobes, heart shaped base, unequal coarsely toothed margin, leaf 6-10 cm long, dark green and shiny above, pale green and whitish bloomy below, the lobes are triangular-ovate with a short sharp point at the apex; red petiole 5-10 cm long.

Flowers. --March. Red, in dense stalkless axillary clusters, red petals, the male and female flowers in different clusters, on the same or different trees.

Fruit. --May. Reddish-green to brown, a smooth key with wings spreading at a narrow angle, 1.5-2.0 cm long with the nutlet borne in clusters on drooping stalks.

Habitat. --Prefers moist soil in lowlands and along the banks of streams, at times it is found on drier hillsides.

Ethnic Remarks. --Acer is the ancient Latin name for the maple, while rubrum refers to the red buds and the red fall foliage of this tree (Stephens, 1969).

The red maple is widely planted as an ornamental tree due to its attractive red flowers in early spring and its bright scarlet and yellow leaves in autumn (Li, 1972).

The Indians obtained lye from the ash of this tree and dye from the bark.

Several Indian tribes made bread from the dried inner bark of the red maple. The bark was ground between stones, sifted to get rid of rough fibers and slivers of wood, and baked in stone ovens. The large maple seeds were boiled after removing the wings and eaten hot. Young maple seedlings were gathered in the early spring and eaten fresh or dried for future use (Weiner, 1972).

Sap can be collected from this tree in the spring and boiled down to make syrup or sugar, however, it takes more sap to make the same amount of syrup that could be made when using sugar maple trees.

American Indians treated eye ailments with a decoction made from the bark. The bark has also been employed to expel worms, as a tonic, and in poultices for skin abrasions (Krochmal, 1973).

Acer saccharum Marsh.

Folknames. --Sugar Maple, Hard Maple, Rock Maple, Sugartree.

Habit. --Large tree up to 40 meters high with a round-topped crown.

Bark. --Grayish-brown, deeply furrowed into long irregular flakes.

Twigs. --Brown, shiny and smooth, flexible, slender, large lenticels. Conical solitary red-brown buds, 5-7 mm. long. Leaf scars V-shaped nearly encircling stem.

Leaves. --Deciduous, simple, opposite, heart shaped in outline with 3-5 pointed lobes and a few coarse teeth; 8-13 cm long and about as wide; petiole slender, 4-7 cm long.

Flower. --Mid-April. Small greenish yellow, bell shaped flowers about 5 mm long on slender, hairy, drooping stalks, 3-7 cm long. Staminate and pistillate flowers occurring in different clusters. Staminate flowers have stamens exceeding the calyx-tube.

Fruit. --August. A key with parallel wings, 2.5-4.0 cm long

with the nutlet, smooth, attached to drooping stalks in clusters.

Habitat. -- Found in upland woods, prefers rich, moist soil in valleys and along slopes.

Ethnic Remarks. -- Acer is the ancient Roman name for maple, while saccharum pertains to the sugar found in the sap (Stephens, 1969).

The wood is used for furniture, flooring, wall panels, musical instruments, and gun stocks (Stephens, 1969). This valuable timber tree is also an important and attractive ornamental often planted as a street and shade tree. In the fall its yellow, orange, and red hues add flamboyant colors to the landscape.

The maples were revered by the Iroquois and other tribes of southern Canada and the northern United States. The sap was drunk fresh or fermented to make an intoxicating drink. The Potawantomi Indians made maple vinegar by allowing the fermentation process to continue for a long time. The vinegar was sweetened with maple sugar and poured over broiled venison.

In order to obtain the sap the Indians started about four feet above the ground and made a vertical slash two inches deep and a foot long. They then drove a flat stick into the bottom end of the cut and the sap ran out over the stick into a bark trough.

Syrup was produced by adding heated stones to the sap until it was evaporated to the consistency of syrup. Another method involved

allowing the sap to freeze overnight; when the ice was removed the next day the unfrozen maple syrup was left in the bottom of the bark container.

Maple syrup was mixed with ground corn and nuts and taken on long journeys as a highly nutritious food. The Iroquois carried maple syrup on journeys in empty quail and duck eggs.

Some people consider the sugar maple to be the most beautiful tree in the world. The Iroquois would certainly agree for they considered this tree to be a "special gift of the Creator." The tribe worshipped the sugar maple each spring at the Maple Thanksgiving Ceremony as the sign of a new year and of the Creator's renewed covenant (Weiner, 1972).

When the first syrup of the year was cooked, the Woodland Indians offered a portion of it to the Great Spirit, or Manido. The manidog (spirits) were requested to give good health, long life, and safety to the people (Ritzenthaler, 1970).

Sturtevant tells of the importance of this tree to the tribes of the Midwest:

In 1870, the Winnebagos and Chippewas are said often to sell to the Northwest Fur Company fifteen thousand pounds of sugar a year. The sugar season among the Indians is sort of a carnival, and boiling candy and pouring it out on the snow to cool is the pastime of the children. (Weiner, 1972)

During February 1975 I tapped fourteen sugar maple trees in the woods on my father's farm in the same manner that my grandfather

taught me when I was 10 years old. Elderberry stems about one inch in diameter and six inches long were hollowed out by removing the pith with a metal rod. The elderberry spiles were inserted into one inch deep holes drilled with a brace and bit. The holes were drilled about one foot from the bottom of the maple trees. Plastic milk jugs were used to catch the sap as it dripped out of the elderberry spiles. Twice daily the jugs were emptied into a large iron kettle. When enough sap had been collected to fill the kettle it was boiled down by burning chunks of logs cut from dead red elm and red oak trees. The boiling down process required eight hours and constant watching was necessary in order to maintain the fire properly. There was something about sitting there in the still dark woods at night watching the fire dance beneath the great iron cauldron, hearing the sap sputter, and smelling the enchanting sweet vapors that evoked a deep feeling of peaceful contentment within me. Pure maple syrup has a very beautiful taste which defies description. On one occasion when I was "sugaring off" there was a fresh fallen snow on the ground and I dripped some of the hot syrup on the clean white snow and made maple taffy in much the same way as the early settlers. I found that it took approximately thirty gallons of sap to make one gallon of syrup.

Potash was exported from the colonies in pioneer days and sugar maple ash was found to be high in potash content. The wood ashes were used in soapmaking. Maple charcoal was used to fire

forges. Sugar maple is one of the best fuel woods and yields a hot bed of coals ideal for broiling (Harlow, 1957).



Fig. 1. --Wooded area where the sugar camp was set up.

Fig. 2. --Large sugar maple tree with old sapsucker
spike and sap collecting jug.



Fig. 3. --Cast iron kettle and split red elm kindling shown during the first phase of sap boiling.

Asaridaceae - The Sassafras Family



Leaves - alternate, pinnately compound, 12-15
 cm long with 7-9 leaflets, leaflets elliptic with
 base, 7-9 cm long, 1-2 cm wide, margin coarsely toothed, blade
 glossy and green above, white below, petiole with enlarged base 5-6
 cm long.

Fig. 4. --The author ladling off impurities during the
 final phase of syrup making.

Anacardiaceae -- The Sumac Family

Rhus glabra L.

Folknames. -- Smooth Sumac, Common Sumac, Pennsylvania Sumac, Scarlet Sumac, Shernoke, Shoemake Sumac, Upland Sumac, Vinegar tree, White Sumac.

Habit. -- Shrub growing to six meters high, often sending up sprouts to form thickets 5-10 meters across.

Bark. -- Grayish-brown, somewhat split on older trunks, however usually smooth with conspicuous raised lenticels.

Twigs. -- Reddish-brown to purplish, rigid, thick, smooth, usually covered with a waxy coating. Conical buds, covered with gray hairs, developing inside the base of the petiole. The narrow leaf scars completely surround the bud.

Leaves. -- Deciduous, alternate, pinnately compound, 30-40 cm long with 15-23 leaflets; leaflets elliptic with tapered tip and rounded base, 7-9 cm long, 2-3 cm wide, margin coarsely toothed, blade glossy and green above, white below; petiole with enlarged base 6-9 cm long.

Flowers. --May-June. Dioecious. Male flowers in broad pyramidal clusters 15-25 cm long at the tip of a new branch; numerous small yellow flowers with 5 petals, 5 sepals, 5 stamens, tapered filaments and small yellowish anthers. Female flowers much like the male, but with smaller more densely flowered clusters; circular, flattened, green ovary covered with silvery-white glands, short style with a yellowish stigma.

Fruit. --August-September. The bright red fruits are roundish, hairy, about 4 mm in diameter and occur in dense, erect, pyramidal clusters 10-15 cm long.

Habitat. --Grows in fence rows, pastures and along the edges of woods in a wide variety of soils, prefers uplands and hillsides.

Ethnic Remarks. --Rhus is the ancient Roman name for the group, while glabra refers to the smooth twigs (Stephens, 1969).

The leaves are rolled and smoked as a treatment for asthma in Appalachia. The bark is boiled in milk and applied to burns to promote healing. A decoction of the bark of the roots or stem can be used in treating gonorrhea, skin ulcers, diarrhea, and infections of the lymph glands. The fruits can be soaked in water to make a refreshing drink and boiled as tea to be used as a gargle for sore throats. An infusion of the fruits has been used as a treatment for fever (Krochmal, 1973).

The Omaha Indians boiled sumac fruits and applied the infusion

as an external wash to stop bleeding after parturition.

The root was chewed fresh by the Indians of British Columbia to cure sores in the mouth. The Micmac tribes used sumac berry tea as a treatment for sore throat and a gargle made from the sumac berries was once commonly recommended by country physicians.

Sumac was used by the Thompsons of British Columbia and the Chippewas of Minnesota to treat the external sores of gonorrhoea. A decoction was prepared by boiling the roots and stems in water. Approximately one pint of the solution was taken in one dose and was usually not repeated for the duration of the disease. The Indians were cognizant of the fact that this remedy was poisonous in large amounts.

The Journals of the Lewis and Clark Expedition noted the use of mountain sumac by the Indians in 1806:

The Chippaways use a decoction of the root . . . of a species of Sumac common to the Atlantic States and to this country near and on the western side of the Rocky Mountains. . . These decoctions are drank freely and without limitation. The same decoctions are used also in cases of the Gonnarea and are effecacious and sovereign. Notwithstanding that this disorder does exist among the indians on the Columbia yet it is witnessed in but few individuals, high up the river, or at least the males who are always sufficiently exposed to the observation or inspection of the phisician. In my whole rout down this river I did not see more than two or three with Gonnarea and about double that number with the pox. (Weiner, 1972)

Dried sumac berries form an article of trade in Canada called sacacomi. When smoked as a tobacco substitute it is said to free one from the habit.

The American Indians have esteemed sumac berries for smoking since ancient times. In the early part of the nineteenth century the practice of smoking sumac berries was introduced in Europe where it became universally esteemed by people of fashion and fortune. The dried berries commanded high prices and were preferred to the best Virginia tobacco by many people.

The Jicarilla Apache and the Tewa Indians smoked the dried sumac leaves in their pipes or rolled them into cigarettes made of corn husks (Lucas, 1969).

The berries contain free malic acid, gallic acid, acid calcium malate, tannic acid, fixed oil, red coloring matter, and volatile oil. The active properties yield to boiling water. The bark is antiseptic, astringent and tonic. The berries are refrigerant and diuretic. A decoction of the bark has been found useful in treating angina. Grieve states that a decoction of the bark is useful in treating gonorrhoea, leucorrhoea, dysentery, hectic fever, scrofula, and even syphilis when combined with the barks of slippery elm and white pine. If the bark is punctured in hot weather a mucilaginous exudation can be collected that is useful in treating gleet and several urinary difficulties (Grieve, 1971).

Indians of the lower Illinois River Valley were known to gather sumac shoots, peel them and eat them raw (Zawacki and Hausfater, 1969).

Rhus radicans L.

Folknames. --Poison Ivy, Three-Leaved Ivy, Poison Oak.

Habit. --A trailing shrub or climbing vine that spreads by underground stems or climbs by aerial rootlets. Variable in form and size from a simple shrub 30 cm tall with no branches to a vine climbing 20 m into trees.

Bark. --Gray; roughened with small raised lenticels; brown or bright red bark present on aerial roots; old bark brown, furrowed and somewhat ridged.

Twigs. --Light brown, slender, pubescent, flexible; buds blunt or pointed, flattened, covered with tan hairs, terminal bud 4-5 mm long. The broad leaf scars are crescent shaped.

Leaves. --Deciduous, compound, alternate; three leaflets that are egg shaped with sharply tapered tip and rounded base, margin coarsely toothed or somewhat lobed; blade 12-17 cm long, 7-10 cm wide, dull yellow-green above, pale and pubescent below; petioles 6.5-20 cm long, covered with recurved hairs.

Flowers. --Late May. Dioecious. Male flower 5-10 cm in

grape-like clusters at the base of a leaf on new growth, many small, yellow-green flowers with 5 sepals, 5 petals, and 5 stamens that have sharply tapered, pinkish filaments and large yellow anthers. Female flowers found in clusters similar to the male, clusters 4-5 cm long; the green globular ovary has a short style and a large 3-lobed stigma.

Fruit. --September. In grape-like clusters, globular, 4-5 mm diameter, creamy-white or ash colored, semiglossy with faint longitudinal creases like a pumpkin; dry, thin, brittle, fruit coat encasing a 2-lobed yellowish seed.

Habitat. --Poison ivy is well adapted to a wide range of habitats. It is a generally abundant vine of deep woods, bottomlands, hills, and uplands as well as a troublesome weed of roadsides and other brushy areas.

Ethnic Remarks. --Rhus comes from the old Latin name for the group, and radicans refers to the aerial roots (Stephens, 1969).

Those people who know they are allergic to poison ivy should become familiar enough with this plant to avoid contact with it. The whitish lac in the leaves, fruit, and stems contains a poisonous substance known as toxicodendrol, which causes an irritating skin inflammation. Poisoning can often be prevented by washing the skin thoroughly with soap and water after being exposed to the plant. If applied to the skin prior to exposure, a vanishing cream containing sodium perborate

is known to give protection against the irritant (Tehon, 1942). A nightshade decoction is a very effective folk remedy for relieving the itching and inflammation of poison ivy.

The annoying itch of poison ivy can be relieved by adding lime water to a strong decoction of white oak bark. A bandage should be soaked with the solution and then applied to the rash. Another remedy can be prepared by making a decoction of spearmint, peach tree leaves, plantain, and lobelia or golden seal. The solution is then applied to the affected area. Golden rod leaves can be soaked in cold water and rubbed on the rash when it itches. The juice should be allowed to dry naturally. A strong solution of epsom salts is also recommended and bathing the affected areas with vinegar is also soothing (Bethel, 1971). Poison ivy rash can also be treated by rubbing crushed jewelweed (Impatiens capensis) leaves and stems on the affected areas. Jewelweed also relieves itching of insect bites and contains an antifungal agent that makes it an effective treatment for athlete's foot (Hall, 1973).

If a portion of poison ivy is taken inwardly it causes stupor, drowsiness, delerium, and convulsive movements (Scholl, 1949).

This plant has long been known in Europe as a cure for herpes infections. A man who accidentally brushed against poison ivy leaves was cured of a difficult herpes infection that had been on his wrist for six years. He reported this marvel to Du Fresnoy, a physician and the plant was soon adopted in general practice.

The Indians of southern California made a mash of poison ivy leaves and applied it externally to cure ringworm (Weiner, 1972).

Annonaceae -- Custard Apple Family

Asimina triloba (L.) Dunal

Folknames. -- Pawpaw, Custard Apple, False Banana, Jasminier, North American Pawpaw, Wild Banana.

Habit. -- Small tree to 12 meters with a short slender trunk. Straight spreading branches forming a high broad crown.

Bark. -- Thin, dark brown covered with light blotches, smooth.

Twigs. -- Reddish brown, slender, hairy when young, covered with a few fine lenticels; leaf scars semicircular; buds brown, egg shaped, naked, hairy; terminal bud 8-10 mm long flattened, lateral buds appressed, 2-3 mm long.

Leaves. -- Deciduous, simple, entire, thin ovate-lanceolate to obovate-oblong, 15-30 cm long, pointed at apex; petioles 5-10 mm long.

Flowers. -- April-May. Perfect, solitary, axillary, 4-5 cm wide, reddish purple, on stout hairy stalks 1 cm long.

Fruit. -- September-October. Greenish yellow with blotches of dark brown, cylindrical, curved 5-13 cm long, 3-5 cm diameter;

thick, sweet, yellow flesh. Seeds brown, shiny, flat, oval, 2.5 cm long.

Habitat. -- Rich moist woods in bottomlands often beneath larger trees and along streambanks.

Ethnic Remarks. -- Asimina comes from Asiminier, which was the early French name for the plant. Asiminier was derived from the Indian name Assimin. The species name triloba pertains to the petals in sets of three (Stephens, 1969).

The yellow fruit is somewhat similar to a mango in appearance and taste and was much used as a fruit by the American Indians and pioneers. The pulp has a consistency somewhat like that of egg-custard and is also similar to that in appearance. It has a creamy feeling in the mouth that combines the taste of eggs, cream, sugar, and spice. The fruits often fall when they are green, hard, and acrid, and are harvested from the ground and kept until ripe (Fernald, Kinsey, Rollins, 1943).

The following passage in native Hoosier dialect from James Whitcomb Riley's "Armazindy" well describes this wild fruit:

And sich pop-paws! --- Lumps o' raw
 Gold and green, --jes' oozy th'ough
 With ripe yaller --- like you've saw
 Custard-pie with no crust too.

On the homeward trek of Lewis and Clark, when they reached western Missouri, game was scarce, each man was rationed one biscuit

a day; however, an abundance of pawpaws grew on the floodplains of the river and supplied them with nourishing food (Medsger, 1939).

The powdered seeds have been used to get rid of head lice. Juice from the fruit has been used to treat cases of intestinal worms, and the seeds have been employed to induce vomiting (Krochmal, 1973).

The shiny brown seeds were used by the Indians as game tokens and for making necklaces. The fibrous inner bark has been used for making fish nets (Harlow, 1957). I have seen the tree growing occasionally along the Embarras, the Wabash, North Fork, and Range Creek and found the fruits to be delicious when I got to them before the raccoons and opossums did.

Betulaceae--The Birch Family

Betula nigra L.

Folknames. --River Birch, Red Birch.

Habit. --A medium-sized tree growing to a height of 40 meters with a narrow, irregular, oblong, crown.

Bark. --Yellowish-brown to reddish brown and peeling off into thin papery scales and strips on young trees; dark reddish brown to grayish, with shallow furrows and flat ridges on older trees.

Twigs. --Reddish-green to slightly gray, slender, drooping, slightly hairy, sometimes zigzag; terminal bud absent, lateral buds reddish-gray, pointed, hairy, 5-6 mm long; broadly triangular leaf scars.

Leaves. --Deciduous, simple, alternate, triangular to egg shaped with a tapered base and a pointed tip, 4-9 cm long, 3.5-6.5 cm wide, margin coarsely, double-serrate, blade shiny and dark green above, pale with a few hairs beneath; slender, hairy petiole 8-14 mm long.

Fruit. --Late May. An erect oblong strobile, 2.3-3.5 cm long, hairy, fragile; seeds reddish brown, broad with a few hairs near the center and a broad thin wing on each side.

Habitat. --Prefers sandy, moist soil in bottomlands, near streams, lakes and swamps, but sometimes is found in drier areas.

Ethnic Remarks. --Betula is the old Latin name and nigra means black; it is not known why it was used in this context (Stephens, 1969).

The river birch is useful as an ornamental and is important along rivers due to its soil binding tendency. It holds down erosion.

The wood is used for furniture, cabinets, woodenware, and small novelties.

The Catawba Indians boiled the buds of this tree until they were pasty and thick and then added sulphur to prepare a salve for external application to skin sores and ringworm. Birch oil is used in medicine to kill parasites and as an antiseptic lotion for skin ailments (Weiner, 1972).

The inner bark of sweet birch, Betula lenta L., is especially sweet and sustaining, and has been credited with saving hundreds of lives in emergency conditions. It can be eaten raw or chopped into bits or cut into spaghetti-like lengths for adding to stews and soups. The inner bark keeps its aromatic spiciness even when dried for storage or transport. The young birch leaves and twigs and the thin

root bark can be steeped in hot water to make a favorite backwoods tea that has the flavor and fragrance of wintergreen. The papery outer bark can be pulled off in dry wisps and used to start campfires under adverse conditions. Birch syrup can be made by boiling down sap from birch trees in the same fashion that maple syrup is prepared. It is said to be sweet and delicately spicy (Angier, 1968).

Excrescences on birch tree trunks have been used by American and Canadian Indians as a moxa for warts (Harris, 1972). The dried leaves, twigs, and bark can be ground into a dusting powder to soothe chafed skin. An infusion made from the bark and twigs has been used to treat gout and arthritis, to purify blood, and as a diuretic (Krochmal, 1973).

The American Indians had many uses for birch bark including vessels, dishes, funnels, canoes, coverings for dwellings, bags, fans, torches when twisted into cylinders, tinder for starting fires that could be gathered dry from tree trunks when everything on the ground was too wet to burn, figures, patterns for beadwork, and transparencies with various designs applied to them. Birch bark took the place of paper for the early Indians and was much appreciated (Densmore, 1974).

Corylus americana Walt.

Folknames. --Hazelnut, American Hazel, American Hazelnut, Hazelbush.

Habit. --A small branched shrub growing 2-5 meters high.

Bark. --Brown to gray-brown, usually smooth, but somewhat split on older stems.

Twigs. --Tan to red-brown, slender, pubescent; buds red brown, egg-shaped; leaf scars half-round.

Leaves. --Deciduous, simple, alternate, broadly egg-shaped or oval with short pointed tip and rounded base, 8-12 cm long, 4.5-8 cm wide, coarsely toothed margin with large and small teeth, blade dark, dull green above, pale and pubescent beneath; petiole 5-12 cm long, hairy.

Flowers. --March-April. Monoecious. The brown male catkins formed the previous summer remain on the plant all winter, are 5-8 cm long, many flowered, each with 4 stamens and hairy, yellow anthers. The female flowers resemble the bud on the side of a twig

with only the red stigmas of the flowers extending from the end.

Fruit. --September. Brown clustered nuts, globular, 15 mm diameter, covered with velvety, short, hairs, surrounded by brown, leaf-like bracts with wavy edges, kernel sweet and edible.

Habitat. --Grows in fencerows, on hillsides and in thickets and is tolerant of various soil conditions.

Ethnic Remarks. --Corylus is an ancient Greek name that means helmet and is descriptive of the helmet-like bracts around the nut.

Americana specifies that it is an American hazelnut. The American hazelnut is the native form of the common filbert of commerce. Hazelnuts can be eaten directly from the bush or used in salads, candies, or cookies. Squirrels and other small mammals eat the nuts as soon as they mature, and many birds nest in the dense thickets formed by the hazel bushes (Stephens, 1969).

Archeological excavations have demonstrated that hazel nuts were utilized as a food source by the Indian tribes of Central Illinois. Carbonized hazel nut shell fragments were found at the Koster Site in the lower Illinois River Valley (Asch et al., 1972). Excavations at the Riverton Site east of Palestine, Illinois also brought up remains of hazel nut shells which proves that these early Wabash Valley Indians made use of this protein rich food source (Winters, 1969).

Bignoniaceae--The Trumpet Creeper Family

Campsis radicans (L.) Seem.

Folknames. --Trumpet Creeper, Trumpet Vine, Virginia Creeper.

Habit. --A long trailing vine that may climb to the top of a 20 meter tree, sprawl over rocks and dirt banks, .or cover a wire fence.

Bark. --Yellow-brown, tight and smooth on young plants, brown and shredded into thin long strips on old trunks.

Twigs. --Pale yellow-brown, flexible, coarse, smooth long internodes, aerial roots along the older stems; buds yellowish, wider than long, 2-2.2 mm wide, smooth scales outside, hairy inside; half-round leaf scars.

Leaves. --Deciduous. Pinnately compound, opposite, 20-30 cm long, 7-11 leaflets. Leaflets egg-shaped, narrow with pointed tip, rounded or wedge-shaped base, 5-8 cm long, 3-4 cm wide, coarsely toothed margin, dull yellow-green blade; petiole grooved on top, 4-6 cm long, slightly winged; leaflets with short stalks.

Flowers. --June-July. Perfect. Orange, clustered, each with a tubular, thick, brownish-green calyx about 2 cm long with 5 triangular lobes, a funnel shaped orange corolla about 6 cm long with 5 overlapping, rounded lobes that spread from the outer end, 4 curved stamens plus one undeveloped filament attached to the corolla, large yellow anthers, ridged, green, egg-shaped ovary with short style and large, flattened stigma.

Fruit. --August-September. Brown pods, 14-20 cm long with bulging sides, a flat flange on each edge where it splits; numerous tightly packed, flat, brown seeds, 16-20 mm long, with papery wings on each side.

Habitat. --Will grow in a wide variety of soil types and environmental conditions. It is commonly found on wire fences and in thickets where it climbs trees and shrubs to compete for sunlight.

Ethnic Remarks. --Campsis comes from a Greek word meaning "curved" and pertains to the curved stamens, while radicans pertains to the aerial roots. The trumpet creeper has attractive orange flowers that are often visited by hummingbirds and insects. One should use discretion when planting it for it's quite aggressive and will dominate an area. It affords excellent cover for mammals and birds and is useful for soil protection along ravines and roadside banks (Stephens, 1969).

The root is used as a home remedy for causing sweating and for healing wounds.

Catalpa speciosa Warder

Folknames. --Catalpa, Western Catalpa, Hardy Catalpa, Bean-tree, Candle-tree, Catawba Tree, Smoking Bean.

Habit. --A tree reaching a height of 20 meters, usually with a short trunk, wide spreading branches, and a broad rounded crown.

Bark. --Grayish-brown to reddish-brown, shallow furrows separating into plate-like ridges, thin.

Twigs. --Brown, rigid, coarse, stout, many prominent lenticels; terminal bud usually absent; lateral buds small, globular, brown, 2 mm across, nearly embedded in the bark.

Leaves. --Deciduous, simple, opposite, entire, large, 15-25 cm long, 10-20 cm wide, heart-shaped with a pointed tapered tip and a rounded base, blade soft and pliable, yellow green above, pale below with curled hairs; petiole 8-11 cm long.

Flowers. --May-June. Perfect. Flowers in large clusters, 4.5 cm long with 2 purplish sepals; white tubular corolla bulging on

lower side, 5 wavy lobes, streaked with purple, 2 stamens with white filaments, bent up toward the large yellow anthers; a green cylindrical ovary with a long white style and a two-lobed flat stigma.

Fruit. --September. The long slender, cylindrical capsule is curved and irregularly ridged and reaches a length of 30-45 cm. Seeds are numerous, brown, winged on 2 sides with a tuft of hair on the ends of each wing.

Habitat. --Prefers rich moist soils in bottomlands or along streams but will also do well in drier conditions.

Ethnic Remarks. --Catalpa is the original American Indian name and speciosa means "showy" in reference to the large flowers (Stephens, 1969). Catalpa is a native of southern Illinois and is highly ornamental with its showy fragrant flowers and large pleasant foliage.

The worms that feed on the leaves during summer are a favorite fish bait for fishermen in East Central Illinois. The light, soft, coarse grained wood is resistant to decay and is used for fence posts, interior finish, and cheap furniture.

According to Krochmal (1973) a tea made from the bark can be used to expell intestinal worms. The leaves can be applied as a poultice to skin wounds and abrasions. The seeds can be used in a decoction to expell worms and to cause vomiting. The tea made from the bark is also a mild laxative.

Caprifoliaceae -- The Honeysuckle Family

Sambucus canadensis L.

Folknames. -- Elderberry, Elder, Elder Bush.

Habit. -- A shrub reaching a height of 3 meters and forming clumps of bushes.

Bark. -- Pale yellow brown to gray brown with prominent lenticels, smooth on young stems, furrowed somewhat on older trunks.

Twigs. -- Pale yellow-brown, smooth with raised lenticels, rigid, coarse; large, reddish-brown, egg-shaped buds.

Leaves. -- Deciduous, pinnately compound, opposite, 15-25 cm long with 5-7 leaflets; each leaflet elliptical, with a tapered tip, wedge-shaped base, sharply toothed margin.

Flowers. -- May-June. Stamens and pistil in the same flower. Flowers small, in large flat-topped or rounded clusters 8-18 cm across with 5 main green branches turning to white near the flowers; white, 5-lobed calyx; 5 white petals connected at the base, about 2.5 mm long; 5 stamens with white filaments and small, yellow anthers;

ovary surrounded by the lower portion of the calyx; white, short, stout style; white, lobed stigma.

Fruit. --August-September. Dark purple, in drooping clusters, globular, about 5 mm diameter, glossy, smooth, juicy, edible, bland; seeds small, yellow, rough, egg-shaped, usually with 2 flattened sides.

Habitat. --Prefers rich soil along streams, valleys, and fence-rows.

Ethnic Remarks. --Sambucus is the old Roman name for the elderberry, probably derived from the Greek word "sambruce", a musical instrument; canadensis pertains to Canada.

The smaller branches can be cut, hollowed by pushing out the soft pith, and notched with holes to make whistles and flutes; the bigger stems can be used for neckerchief slides (Stephens, 1969). The fruits are used for pies, syrup, jam, and wine, and are a favorite of many birds and mammals (Stephens, 1969).

Spickets (spiles) used in tapping maple trees to gather sap can be made from the stems as was a common practice with the American early settlers.

Increased flow of urine and sweating can be induced by drinking a hot infusion of one or two teaspoonfuls of the flowers. If given in too large a quantity it may cause vomiting. The edible flowers have also been used in treating syphilis, scurvy, and rheumatism. Elder-

berry jam has laxative properties. A decoction that acts on the kidneys and intestines can be made from the inner bark. The dose is one to two teaspoonfuls, two or three times a day (Scholl, 1949).

The Mohegan Indians used a tea made from elder flowers to treat colic in babies. The Houma Indians boiled the bark to prepare a wash for treating inflammations, while the Menominees drank the flower tea to reduce fevers. The Meskwakis used the root bark tea to help expulsion of phlegm, to induce labor, and to treat headache. Elderberries were listed in the U.S. Pharmacopoeia from 1820 to 1831 and elder flowers were listed therein from 1831 to 1905. Elder flowers are known to have diuretic, stimulant, and sweat inducing properties (Weiner, 1972). A purple dye can be obtained from the fruits (Hall, 1973).

Viburnum prunifolium L.

Folknames. --Blackhaw, Sweet Haw, Stagbush, Sheepberry, Nannyberry, Sheepbush, Shonny, Sloe, Sloe-leaved Vibrunum.

Habit. --Shrub or small tree reaching a height of 10 meters.

Bark. --Nearly black, furrowed, with ridges broken into short blocky plates.

Twigs. --Grayish-brown, slender, rigid, smooth, often with a waxy covering; flower buds 6-10 mm long, somewhat flattened laterally, leaf buds smaller red-brown, egg-shaped, rounded end, crescent shaped leaf scars.

Leaves. --Deciduous, simple, alternate, ovate to broadly oval, obtuse to acute at the apex, rounded at the base, 4-8 cm long, 3-6 cm wide, very finely serrate margin, glabrous; petiole .5-1.5 cm long.

Flowers. --Late April. Perfect. Borne in sessile or very short stalked cymes 2-4 inches broad, that bear several neutral flowers along with the fertile flowers, white, numerous, about 0.5 cm in diameter.

Fruit. --September-October. In drooping clusters, each sweet edible drupe is oval, bluish-black, bloom covered, 10-14 mm long, and contains one oval stone, flat on one side and slightly convex on the other.

Habitat. --Grows in open woods, fence rows, hillsides, and thickets along roadsides, prefers well drained soil.

Ethnic Remarks. --Vibrunum is a Latin name which pertains to the leaves that are like Guelder-Rose; prunifolium refers to the fruit's appearance (Stephens, 1969).

The bark of the black haw was used in domestic medicine in the early 1800's as a uterine tonic and a decoction of the bark of this species was a popular remedy for uterine hemorrhage. A decoction of the young twigs is astringent and was used to treat diarrhea. The Catawba Indians beat the bark into a mash, mixed it with wheat flour and water and drank the concoction to cure dysentery. A tea made from the roots was used in treating stomach trouble (Vogel, 1970).

According to Bethel (1971), the root bark of Viburnum prunifolium L. has diuretic, tonic, antispasmodic, nervine, and astringent properties. It is said to counteract threatened abortion and to relieve after pains. Black haw is also said to be useful for ovarian irritation, asthma, and hysteria.

The sweet edible fruits remain on the plant through December

and taste somewhat like dried blueberries. I have eaten them at times when out on woodland excursions in the winter.

It is known that the Indians of the Lower Illinois River Valley ate blackhaw fruits (Asch et al., 1972).

Celastraceae--The Staff Tree Family

Celastrus scandens L.

Folknames. --Bittersweet, False Bittersweet, Waxwort, Staff Vine, Woody Nightshade, Wolf Grape, Violet Bloom, Fever Twig, Felenworth.

Habit. --Long twining vine up to 12 meters long and up to 6 cm in diameter at the base, often forming a dense mass of vines in low trees or on bushes.

Bark. --Light brown to gray, young stems, smooth with prominent lenticels, old trunks have flaky bark.

Twigs. --Gray-brown, slender, twining, flexible, glabrous; reddish brown buds are small conical and often at nearly right angles to the twig; leaf scars half-round, small.

Leaves. --Deciduous, simple, margin finely toothed, alternate, elliptic, tapered at both ends, more abrupt at the base, 7-10 cm long, 4-6 cm wide, blade dark yellow green; petiole 1-1.5 cm long.

Flowers. --Mid-May. Dioecious. In clusters 3-6 cm long at

leaf base on new growth or on a branch tip. Male flowers small with five green, thin sepals and five yellowish elliptic petals and five stamens with yellow anthers and tapered filaments. Female flowers small with five thin sepals that are nearly transparent, five yellowish, elliptic petals that are usually curled back and a globular green ovary with a yellowish, three-lobed stigma.

Fruit. -- Late September. 6-20 fruits in drooping clusters 6-10 cm long; each fruit 8-12 mm in diameter, globular with a leathery orange coat that splits into 3 sections exposing the bright crimson arils that surround the seed. Each aril usually contains 2 reddish brown seeds about 5.5 mm long.

Habitat. -- Bittersweet is found in thickets along roadsides, in the edge of a woods, or climbing over a fence. It grows in a wide variety of soils in moist or dry conditions, but reaches its greatest size in moist rich soil.

Ethnic Remarks. -- Celastrus comes from the ancient Greek name for an evergreen tree and scandens pertains to its climbing habit (Stephens, 1969).

Bittersweet is often used as an ornamental due to its pleasing yellow-green foliage and its clusters of bright-orange and red colored fruit that remains on the vine until winter. Its dense, thick, growth and tendency to sucker freely make it a favorite for trellis-work and

as a cover for fences. It should not be allowed to wind around trees for it will injure them by constriction. It thrives in shade or sunlight, but prefers shade, as one can determine by observing it growing along an east and west fence. In such a situation the greatest part of the colony will be on the north side of the fence.

It can be easily propagated by sowing the seeds in the fall, by layering, and by root cuttings (Deam, 1932).

Deam (1932) refers to a Hamilton County, Indiana, pioneer who made an "all-healing" salve from a decoction made by boiling the root bark and Meyer (1970) considers it an alterative, diuretic and hepatic.

Bittersweet is a well known vine in east central Illinois and is used as a winter bouquet and our home is traditionally adorned with it in the fall. Commercial collectors gather it to sell in some localities and this over-collecting threatens to exterminate it in some areas.

According to Dr. Edward Palmer and other writers on Indian foods, the sweetish bark and the tender branches of bittersweet were used by the Chippewas as food after the poisonous saponin found in the bark was removed by cooking. The boiled bark is said to be sweet and palatable (Fernold, et al., 1943.)

Culbreth (1927) indicates that bittersweet fruits contain dulcamarin, solanine, resin, benzoic acid, and calcium lactate. It is narcotic, diuretic, alterative, deobstruent; large doses cause vomiting,

vertigo, faintness, convulsive muscular movements, weakened heart action, and paralysis. Bittersweet extract is used in treating rheumatism, cutaneous eruptions, gout, whooping-cough, nasal, vesical, and pulmonary catarrhs, mania with strong venereal desire, and neuralgia.

The decoction of the root bark is very healing when applied to burns and scalds and the tea is useful in treating jaundice, syphilis, gonorrhoea, and rheumatism. It makes the skin and kidneys active and increases menstrual flow (Kloss, 1973).

Euonymus atropurpurea Jacq.

Folknames. --Wahoo, Spindle Tree, Burning Bush, Indian Arrow Wood, Euonymus, Indian Root, Whahow, Pegwood, Strawberry Tree.

Habit. --Small erect shrub up to 3 meters high.

Bark. --Gray, thin, smooth on young trunks, scaly on older trunks.

Twigs. --Green, slender, erect, 4-angled, rigid. Terminal bud purplish, conical, narrow, 3-5 mm long; lateral buds smaller and greenish; leaf scars half-round.

Leaves. --Deciduous, opposite, simple, margin finely toothed, elliptic, with tapered tip, abruptly tapered base, 5-9 cm long, 2.5-5 cm wide, blade dark green; petiole 1-1.5 cm long.

Flowers. --Late May. Perfect. Found in loose flat-topped clusters of 10-15 at a leaf base or from a node without a leaf; each flower has 4 small, reddish-purple sepals and 4 small rich reddish-purple petals and a 4-sided purple disc in the center. One of the four stamens with yellow anthers is found in each corner of the disc. The green ovary with its 4-lobed stigma is mostly embedded in the disc.

Fruit. --October, remaining until mid-winter. The four lobed reddish fruits are found in clusters on long pendent stalks and are about 2 cm across; each lobe splits open and exposes the bright red covering around the seed. The yellow-brown, smooth, oval seeds are about 8 mm long.

Habitat. --This shrub is usually found on stream banks and in the adjacent alluvial bottoms. It is rarely found on wooded or rocky slopes or in moist situations and prefers rich lowland soil.

Ethnic Remarks. --Euonymus is an old Greek word that means "a good name" and atropurpurea pertains to the deep purple flowers (Stephens, 1969).

The aboriginal name "wahoo" came from both the Sioux and the Creeks (Vogel, 1970).

The powdered bark was used by the Woodland Indians for tobacco and the bark of the root is used as a gastric stimulant and cathartic (Deam, 1932). The seeds are poisonous if eaten (Fernald, et al., 1943).

A decoction for treating dropsy can be made by placing an ounce of the chopped roots into a pint of boiling water. The dose is a wineglassful three or four times a day (Scholl, 1949).

Wahoo bark was used in Indian medicine for uterine problems, as an eye wash, and as a physic. The early settlers also used it as

a diuretic. In 1912 a report was published that showed this species to have a digitalislike effect on the heart and wahoo then became a popular heart medicine. The bark has a sweetish taste and is best gathered in the fall for medicinal use (Weiner, 1972).

Euonymus was a long-time favorite remedy in domestic medicine and in the later 1800's there was a craze for it in England. Tonic and laxative properties were attributed to this drug and it was used with success in dropsy and liver ailments. It was also believed that wahoo had emetic, discutient, and antisyphilitic properties. The seeds were believed to be narcotic, nauseous, and purgative and have been used to destroy vermin in the hair. Winnebago women drank a decoction of the inner bark of wahoo for uterine trouble. The Meskwakis prepared an eye lotion by steeping the inner bark of the trunk. A poultice for old facial sores was made by pounding the fresh bark of the trunk. The Mohegans made a tea from wahoo bark and employed it as a physic (Vogel, 1970).

Cornaceae--The Dogwood Family

Cornus florida (L.) Rof.

Folknames. --Dogwood, Flowering Dogwood, Arrow Wood, Cornel, Dog Tree, Boxwood, False Box, Florida Dogwood, Flowering Cornel, New England Boxwood, White Cornel.

Habit. --An erect shrub or small tree reaching a height of 6 meters.

Bark. --Dark gray-brown, divided into thin, small, flat-topped block-like plates.

Twigs. --Reddish-gray to greenish, flexible, medium slender; flower buds pinkish-gray, flattened globular, about 7 mm diameter, on the end of a branch; leaf buds smaller, flattened laterally, crescent-shaped leaf scars.

Leaves. --Deciduous. Simple, alternate, opposite, broad elliptic, with abruptly pointed tip and rounded or wedge-shaped base, 9-15 cm long, 5-9 cm wide; margin entire, dark green blade with appressed hairs above, paler, with both appressed and erect hairs below; petioles 3-8 mm long.

Flowers. --April-May. Perfect. The real flowers are in the center of 4 large white "petals" that are actually bracts. The whole structure is about 8 cm across. Each small flower has a 4 lobed cylindric green calyx, 4 greenish-yellow petals about 4 mm long, 4 stamens with small, yellow anthers, and a yellowish ovary encompassed by the calyx with style and stigma exposed.

Fruit. --Late September. Brilliant orange-red, clustered, oval, smooth and glossy, 8-10 mm long, yellow orange pulp, dry, oval cream colored seed with 5-7 longitudinal grooves.

Habitat. --Grows on hillsides and along streams usually under a canopy of taller trees, tolerant of various soil conditions.

Ethnic Remarks. --Cornus comes from the Latin word cornu, "a horn", pertaining to the hard wood, while florida means flowering and refers to the large "flowers." The hard heavy wood is used for heads of golf clubs, mallets, pulleys, roller skate wheels, and chisel handles (Stephens, 1969).

The Menominees injected the warm solution made from the inner bark of the dogwood into the rectum with a rectal syringe made of the hollow bone of a bird and the bladder of a small mammal to treat dysentery (Weiner, 1972).

The Delaware Indians called the tree "Not-ta-wa-no-min-schi" and made a tea from the inner bark to reduce fevers. When the supply

of Peruvian cinchona bark to the southern states was cut off during the Civil War, dogwood bark was substituted as a fever remedy. Dogwood bark is recognized for containing the glucoside cornin which is known for its astringent properties (Weiner, 1972).

Jaeger (1966) states that in the old days peeled twigs of the flowering dogwood were chewed at the end until they became brush-like and were used as toothbrushes because their chemical content was thought to whiten teeth.

According to Saunders (1934) a red dye can be obtained from the fibrous roots of the flowering dogwood.

A decoction made from the bark has been used to treat cholera, sore mouth, jaundice, liver ailments, and to expel worms (Krochmal, 1973).

Cupressaceae--The Juniper Family

Juniperus virginiana L.

Folknames. --Red Cedar, Juniper, Pencil Cedar, Virginia Juniper, Savin Juniper, Red Juniper.

Habit. --A tree growing to 30 m or more in height, with upright or spreading branches forming a pointed cone-shaped or broadly pyramidal crown.

Bark. --Reddish-brown, thin, grooved, shredding into long, flat strips. .

Twigs. --Young twigs green, older stems brown, slender.

Leaves. --Evergreen, simple, opposite, scale-like, 1.5 mm long, or awl shaped, 5-6 mm long, sharply pointed away from the stem.

Flowers. --Late April. Dioecious. Male flowers yellow-brown, resembling a small cone on the end of a twig, with about 6 pairs of stamens. Female flowers green, globular, cone-like, short stalked with about 6 scales.

Fruit. --September. Globular cones 6-7 mm across, dark blue, bloomy, 1-2 deeply pitted seeds.

Habitat. -- Prefers open areas with rich loamy soil on hillsides, and sunny slopes, along streams, common in pastures.

Ethnic Remarks. -- Juniperus comes from the old Latin name, while virginiana pertains to the state of Virginia.

Red Cedar is often planted as a windbreak around farmsteads in east central Illinois, however the sharp needles that fall to the ground are considered undesirable as anyone who has gone barefoot around a red cedar tree can attest. It is often infected with "cedar apple" fungus that often forms brown balls along the branchlets, so it's not desirable around fruit trees. The trunks are very durable and resistant to rotting and are used for fence posts. The wood has a pleasing scent when cut and is made into chests, small novelties, closet linings, and lead pencils. It is also used in the distillation of cedar oil used in perfumes, soaps, and kitchen deoderants (Stephens, 1969).

Boiling an ounce of the pounded berries in two pints of water produces an infusion that stimulates action of the kidneys. For treating Bright's disease and its attendant dropsy a pint is drunk throughout the day. In doses of two or three teaspoonfuls daily the juice of the berries has been successfully used to promote the secretion of urine in children. The oil can also be dropped into boiling water and inhaled to give the same results. (Scholl, 1949).

The berries of the juniper are used to flavor gin. The Creeks and Choctaws drank red cedar berry oil to treat dysentery. The Nat-

chez Indians employed juniper for treating mumps. Several Indian tribes made a tea from the fruits and leaves to treat coughs, colds, and the Asian flu. Juniper was entered in the U.S. Pharmacopoeia from 1820 to 1894 as a diuretic. A volatile oil from cedar wood has been employed for abortion, and has resulted in vomiting convulsions, coma, and death in a few cases. Cedrol, red cedar wood oil which is composed of cedar camphor is used as an insecticide and a moth repellent. The Kiowas used cedar needles as an incense during the peyote meetings (Weiner, 1972).

A mixture of the seeds, leaves, and twigs is boiled and the vapors inhaled as a treatment for bronchitis by people in Appalachia. The American Indians made a warm poultice of boiled leaves and sprigs to treat rheumatism. A decoction made from the fruits has been used as a stimulant, a febrifuge, and to treat menstrual delay. A solution made by boiling the bark in water has been used to treat skin rash by Spanish-speaking New Mexicans (Krochmal, 1973).

Ebenaceae--Persimmon Family

Diospyros virginiana L.

Folknames, --Persimmon, Possumwood, Date Plum.

Habit. --Small tree up to 30 meters in height with a slender trunk and round-topped crown.

Bark. --Dark brown or black, thick and hard, deeply furrowed into blocky ridges.

Twigs. --Dark grayish-brown, flexible, slender, covered with a few scattered orange lenticels. Buds small, broadly ovoid, 2-3 mm long, pointed tips with 2 dark brown shiny scales.

Leaves. --Deciduous, simple, alternate, thick, ovate to elliptic, 6-14 cm long, acuminate apex, dark green, entire, shiny above, pubescent beneath; petioles 1.5-2.5 cm long.

Flowers. --May-June. Dioecious, white, corolla bell shaped with 4 reflexed lobes. Staminate flowers in clusters of 2 or 3, about 1 cm long, with 16 stamens. Solitary pistillate flowers about 1.5 cm long on short stalks with four 2-lobed styles.

Fruit. --September-October. Fleshy spherical berry, 2.0-3.5 cm across, pale orange, wrinkled when ripe, sweet. Seeds reddish-brown, oval, flat, about 2 cm long.

Habitat. --The persimmon prefers upland woods, pastures, and hillsides, but is sometimes found in bottomlands and valleys.

Ethnic Remarks. --Diospyros in original Greek means "fruit of the Gods" or "grain of Jove"; virginiana pertains to the state of Virginia (Stephens, 1969).

The Cherokees drank a decoction made from the boiled persimmon fruit to treat bloody stools. The fruit was entered in the U.S. Pharmacopoeia from 1820 to 1882 for its astringent properties.

The Catawba tribes boiled persimmon bark and used the resulting dark solution as a mouth wash to cure thrush. Due to their high vitamin C content the leaves of this plant are eaten by some people to prevent scurvy (Weiner, 1972).

The fruit and bark contain tannin and malic acid which both act as an astringent for diarrhea, chronic dysentery, uterine hemorrhage, leucorrhea and sore throat. It can be administered in a tincture, an infusion, or a syrup. The ripe fruits can be fermented with hops to produce persimmon beer (Culbreth, 1927).

My mother makes a persimmon pudding by using persimmon pulp, flour, sugar, butter, hickory nuts, and cinnamon. The mixture

is baked in a flat pan and cut into squares before serving. The rich dark pudding has an exotic flavor that defies description. Persimmons are tasty raw providing they are fully ripe. The oxalic acid in unripe persimmons causes them to be unbearably acrid as I well know from experience. It usually takes a hard frost to fully ripen persimmons.

Fagaceae--The Beech Family

Fagus grandifolia Ehrh.

Folknames. --American Beech, Beech, Red Beech, Ridge Beech, Stone Beech, White Beech, Winter Beech.

Habit. --Large tree up to 40 meters high, with a dense symmetrical crown.

Bark. --Light gray with mottled dark spots, close, smooth.

Twigs. --Gray to dark yellow, slender, pubescent becoming smooth, covered with yellow lenticels. Long slender buds, 5 times longer than wide, sharply pointed, conical, brown, lustrous. Narrow leaf scars that nearly encircle the branchlet.

Leaves. --Deciduous, simple, alternate, ovate-oblong, stiff-leathery. 6-12 cm long, wedge shaped base with sharp pointed apex, coarsely toothed margin, dark bluish green upper surface, light green underneath. Petioles 3-8 mm long.

Flowers. --April-May. Yellowish-green, staminate flowers in a round stalked head about 2.5 cm diameter; bell-shaped calyx with

4-7 lobes, hairy; corolla absent; 8-10 stamens. Pistillate flowers in clusters of two on short hairy stalks; calyx urn-shaped with 4-5 lobes, ovary 3 celled.

Fruit. --October. Stalked prickly burr containing many triangular nuts, involucre with slender recurved or straight prickles about 2 cm long; nuts brown, shiny, with sweet edible kernal.

Habitat. --Prefers moist, rich, well-drained loam but also thrives in rich uplands and gravelly slopes.

Ethnic Remarks. --Fagus, the ancient Roman name for the beeches, comes from the Greek word meaning "to eat." The species name grandifolia refers to the size of the leaves (Stephens, 1969).

Due to its clean trunk and limbs and its deep shade the American Beech is a desirable ornamental. It grows well in a wide variety of soils and has very few insect pests (Li, 1972).

The close-grained, pinkish-brown wood is moderately strong, and heavy and is used for flooring, interior finishing, woodenware, furniture, tool handles, shoe lasts and as ox yokes and wagon tongues. The nuts are a delicious food for man and were used by the early settlers and the Eastern Woodland Indians. The nuts are an important food for wild turkeys and hogs also fatten on them. An oil may be pressed from the kernals and used in cooking.

It is thought that the beechnuts were at one time a primary

food source for mankind. Beechnuts are about twenty-two per cent protein and the Iroquois Indians utilized them as an important part of their diet. The kernals were eaten fresh, after removing the tannin in the same method as was employed for acorns, or stored for use in times of scarcity. The inner bark of the beech tree was dried and pounded to use in making bread. Roasted beechnuts were utilized by the early settlers as a substitute for coffee (Weiner, 1972).

A decoction made from fresh or dried beech leaves was used by the pioneers as a lotion for treating burns, frostbite, and scalds. The Woodland Indians steeped a handfull of the chopped fresh bark in a cup of water and applied the decoction to skin rashes, especially those caused by poison ivy (Krochmal, 1973).

The leaves have been used to stuff mattresses because they last for a number of years without getting musty.

Quercus alba L.

Folknames. -- White Oak, Oak, Ridge White Oak, Stone Oak, Stave Oak, Tanner's Oak, Fork-leaf White Oak.

Habit. -- A large tree up to 40 m in height, growing tall and straight in a forest environment, but forming many spreading, twisted, stout, branches creating a deep, broad, irregular crown in open areas.

Bark. -- Light gray to whitish, thick, fissured into flat, loosely attached irregular scales.

Twigs. -- Green and pubescent at first, then becoming reddish-brown and smooth, later gray brown, covered with many small, light, raised lenticels; broadly ovoid buds, bluntly pointed, about 3 mm long, clustered at tip of twig, smooth scales; leaf scars half-round.

Leaves. -- Deciduous, simple, alternate, tapered base, widest at the outer end, 13-23 cm long, 8-13 cm wide, 5-9 usually ascending and deeply divided lobes with rounded ends and no teeth; bright green above, paler and often blooming below; stout petiole 1-1.5 cm long.

Flowers. -- May. Monoecious. Staminate flowers in hairy catkins 5-8 cm long. Pistillate flowers short stalked, yellow, hairy; spreading styles are red.

Fruit. --October of first year. Sessile or short stalked acorn with a gray lumpy cup covering 1/3 to 1/2 of the nut. Nut brown, elliptic, 2-3 cm long, 15-19 mm thick, with flattened base and rounded top.

Habitat. --More common on upland soil than wet borromland soil, but will grow well in a wide variety of situations.

Ethnic Remarks. --Quercus is the old Latin name and alba means "white" and pertains to the light bark color (Stephens, 1969).

Its noble form makes it an outstanding lawn tree; in the fall the bright green leaves turn to a deep red or violet purple. White oaks produce abundant crops of acorns that are stored and eaten by squirrels and other small animals. In some areas hogs are fattened by gleaning acorns in white oak woodlots. The wood is sawed into barrel staves for making whiskey and the sturdy lumber is used in farm buildings and gates.

A decoction for dysentery and diarrhea can be made by adding one ounce of the bark to a pint of water and is given in doses of half a teaspoonful to a teaspoonful three times a day. It is also used as a gargle in sore throat and catarrh. The powdered bark is applied on ulcers. The white oak yields tannic acid that is used as an astringent douche in gonorrhoea, leucorrhoea, and gleet (Scholl, 1949).

Acorns were a very important food source of many Indian

tribes. The bitter and constipating tannin had to be removed in order to make the tender nuts palatable. In the late 1890's V. K. Chestnut visited the Indians of Mendocino County, California, and took note of their method of utilizing acorns as the following passage relates it:

The broad and stately white oak is the most characteristic tree of the best farming land of the region, but in every locality throughout the county there are one or more different species of oak which furnish in good seasons a great abundance of acorns, which although not edible in the raw condition, are converted by simple processes into a very satisfying and wholesome diet. The Concoos, especially, who are not used to eating much meat, claim that they never get sick from eating the mush and bread made from acorns. As a class these nuts are oily, and hence they replace in a measure the oily fish more largely consumed by the coast Indians.

In order to make soup and bread the tribes of Round Valley dried the acorns in the sun and then ground the nuts into a fine meal by using a stone mortar and pestle. According to Mr. Chestnut the bitter tannin was removed in the following fashion:

[The meal was mixed] with water in a shallow depression which is made in sand or some porous material and . . . the water [was allowed] to percolate through the mass until the bitter taste has disappeared. A couple of hours are usually required for the operation. . . The acorn meal after this process has the consistency of ordinary dough. It is sometimes converted into bread while still in the sand by building a fire around it; but this method is objectionable on account of the sand which adheres to the bread and the loss of the oil . . . A considerable quantity is scooped out from the center of the depression; and this, which is entirely free from sand, is reserved and afterwards made into bread. The remainder of the dough . . . is rubbed up with . . . water . . . and this is converted into soup.

The dough selected for acorn bread is mixed with red clay before it is baked, the proportion being about one pound

of clay to twenty of dough. This clay, several Indians explained, makes the bread sweet. Others stated that it "acted like yeast." The mixture is placed on a bed of soaproot, oak, maple, or even poison-oak leaves, which in turn rests on a bed of rocks previously heated by a small fire. The dough is then covered with leaves and a layer of hot rocks and dirt and cooked gently in this primitive oven for about twelve hours, usually over night. When removed the next morning the bread, if previously mixed with clay, is as black as jet, and, while still fresh, has the consistency of rather soft cheese. In the course of a few days it becomes hard, when, on account of the leaf impressions stamped upon it, it might easily be mistaken for a fossil-bearing piece of coal.

According to the ethnobotanist H. H. Smith, John Muir, the famous naturalist carried the hard dry acorn bread of the Indians on his grueling jaunts in the mountains of California and praised it as the most compact and strength-giving food he knew of. We also learn from Smith that oak trees that produced abundant crops were so important that they were considered to be personal property among the Pomo Indians of California. The ownership of the trees was handed down through the family according to definite rules.

White oak acorn meal is about six percent protein and sixty-five percent carbohydrates. In Greece and France this nutritious food has been used since ancient times (Weiner, 1972).

In Appalachia, a decoction made from the bark is used to treat burns and sore eyes; and the pulverized bark has been used as a substitute for quinine. The roots when crushed and mixed with whiskey were rubbed on arthritic joints (Krochmal, 1973).

Quercus macrocarpa Michx.

Folknames. --Bur Oak, Mossycap Oak, Overcup Oak.

Habit. --Tree growing to height of 55 m with spreading branches that form a broad rounded crown.

Bark. --Gray-brown, thick, fissured longitudinally and irregularly into ridges.

Twigs. --Ash-gray to yellow-brown, stiff, coarse, corky ridged and often hairy; buds conical or broadly ovoid, 3-5 mm long, sharply or bluntly pointed, reddish brown, terminal buds often clustered while lateral buds are closely appressed.

Leaves. --Deciduous, simple, alternate, tapered or rounded base, widest near outer end, 15-27 cm long, 6-15 cm wide; 5-7 rounded lobes, usually deeply cut, blade shiny dark green above and pale below; the stout petiole is 1-2 cm long.

Flowers. --Late April. Monoecious. Staminate flowers in slender hairy catkins 10-15 cm long. Pistillate flowers reddish, hairy, short stalked; styles bright red.

Fruit. --October of first year. Sessile or short stalked acorn, usually solitary with large gray acorn cup having rough scales and covering most of the nut. Nut gray-brown, egg shaped, rounded outer end, flattened base, broad, covered with down; kernal sweet and yellow in color.

Habitat. --Tolerant of many types of soil, but prefers low, rich bottomlands and is rather intolerant of shade.

Ethnic Remarks. --Quercus comes from classical Latin and macrocarpa describes the large fruit (Stephens, 1969).

The bur oak is a favorite tree for squirrels due to its many horizontal limbs and abundant knotholes as well as its large nuts.

The oaks were intertwined in many ancient cultures. The Thracian Maenads of Dionysus' female retinue wore oak-wreath crowns as they danced with their heads thrown back in ecstasy (Guirand, 1972).

The Celts worshipped their gods in forest glades and sacred groves usually where there was a spring-fed pool. In Britain and Gaul, the oak, especially when clad with mistletoe, was believed to be a sacred tree. (The present day use of mistletoe at Christmas is a vestige of the old Celtic religion absorbed by Christian custom in northern lands.) The sacred oaks were adorned with ornaments of gold, silver, bronze, and electrum and were the center of many religious and magical rites (Canby, 1961).

In Central Illinois bur oak wood is sawed into barrel staves for making whiskey. The sturdy decay-resistant lumber is also used for farm buildings, gates and implements. The kernal is edible and sweet when roasted.

Quercus muehlenbergii Englem.

Folknames. -- Chinquapin Oak, Chestnut Oak, Yellow Chestnut Oak, Rock Oak.

Habit. -- A medium-sized tree growing to 40 m tall with long straight trunk in a forest environment; in the open it is low and branching with a broad open crown.

Bark. -- Ash color to light gray, thin, rough, long irregular fissured ridges, breaking up into scales.

Twigs. -- Grayish to orange-brown or greenish-brown, stiff, slender; buds egg shaped, sharply pointed, chestnut brown, somewhat hairy; raised leaf scars, concave above, rounded below.

Leaves. -- Deciduous. Simple, alternate, oblong to oblong-lanceolate, 10-16 cm long, rounded base and bluntly or sharply pointed apex, coarsely toothed margin with 10-14 rounded or pointed, coarse teeth on each side, a main vein extending to each tooth; the leathery blade is dark yellow-green and glossy above, pale and pubescent beneath; petiole somewhat hairy, 1.5-3 cm long.

Flowers. -- May. Monoecious. Staminate flowers in hairy

catkins 8-10 cm long. Pistillate flowers on short stalks or sessile; bright red styles.

Fruit. --September of first year. Sessile on short-stalked acorn with brownish-gray lumpy cup 6-10 mm high, 8-20 mm wide, enclosing 1/4 to 1/2 of the nut. Nut brown, egg shaped with flattened base and narrow, rounded tip, 16-22 mm long and downy.

Habitat. --Found on dry hillsides, rich bottom lands, rocky river banks; prefers limestone soil.

Ethnic Remarks. --Quercus is the ancient Roman name for the oak, while muehlenbergii is used in honor of Gotthilf Henry Ernest Muhlenberg. Lumber from the Chestnut Oak is sold on the timber markets as white oak and is used for furniture, flooring, and interior finish (Stephens, 1969). It is a desirable ornamental for parks and lawns and has an attractive form with handsome foliage. Wood of this tree was used to make the famous rail fences.

Chinquapin acorns were an important food staple for the American Indians. The advanced Southern Illinois Woodland people known as the Baumer Culture owed their advancements largely to their knowledge of how to store food over long periods, thus allowing them to have permanent settlements. Excavations at Baumer sites have turned up numerous food storage pits containing the remains of acorns and hickory nuts. Acorns were abundant enough for a Baumer family to store

several months' supply in a short while. This allowed them to live in bigger villages and gave them enough leisure time to build substantial log houses and to make tools, weapons, and symmetrical ornaments from stone (Deuel, 1958).

From personal communication with Noble Hurt, a Cumberland County farmer, I learned that in the past a decoction was made by boiling oak inner bark in water. The solution was then poured over the oats given to a horse infested with intestinal worms. The worms would then be expelled a day or two later.

According to Wren (1968) acorns can be grated or powdered and washed down with water as a cure for diarrhea.

Quercus rubra L.

Folknames. --Red Oak, Northern Red Oak.

Habit. --A large tree with a tall straight trunk and a round-topped crown reaching a height of 50 meters.

Bark. --Gray to dark brown, thick, fissured into regular, broad, flat-topped ridges.

Twigs. --Reddish-brown, shiny, slender, stiff, covered with inconspicuous pale lenticels; buds reddish-brown, pointed, egg-shaped, 3.5 mm long, clustered at the tip of the twig; leaf scars half round and raised.

Leaves. --Deciduous, simple, alternate, oval or widest near the outer end, with a tapered base, 13-23 cm long, 10-15 cm wide, 5-14 bristle-tipped, narrow, tapered, lobes with a few bristle-tipped teeth, spaces between the lobes wide and rounded, blade dark green and shiny above, pale with tan hairs at the base of the side veins below; petiole smooth, stout, 2.5-4 cm long.

Flowers. --April. Staminate flowers at the base of new growth, 7-12 cm long with 30-35 greenish-tan, small flowers, each having 4

stamens and small, yellow anthers; pistillate flowers at the base of the leaves on new growth, each small flower globular, covered with green scales, a long, curved, 3-lobed stigma.

Fruit. --October of second season. A short stalked acorn, solitary or in pairs; nut reddish-brown, ovoid with a pointed tip, 2.5-3.0 cm long, enclosed at base by the brown saucer-shaped cup with scales and pubescence; kernal pinkish, bitter.

Habitat. --Grown on hillsides and uplands and prefers gravelly clay or porous sandy soil, being intolerant of wet conditions or too much shade.

Ethnic Remarks. --Quercus is the old Roman name for the oaks and rubra means red, in reference to the color of the inner bark and heartwood.

The red oak is a valuable timber tree and makes an attractive shade and avenue tree also, with its tall straight trunk and stout spreading branches and large leaves that turn red in the fall (Li, 1972).

The lumber from this tree is widely used by farmers in east central Illinois for buildings, gates, and fences. Some of the farm buildings on my father's farm have sturdy red oak frames. Its rapid growth and tall straight trunk make it ideal for logging operations. The wood is also used for furniture, cabinets, and interior finish.

Grossulariaceae--The Gooseberry Family

Ribes missouriense Nutt.

Folknames. --Wild Gooseberry, Missouri Gooseberry, Wild Currant.

Habit. --Thorned shrub. Usually erect, sometimes spreading, up to 1.5 meters high.

Bark. --Reddish-brown to dark gray, splitting into thin sheets that curl up or shredding into thin strips.

Twigs. --Pale tan to dark reddish brown, slender, covered with straight brown prickles or having 2-3 long prickles at the nodes. Buds reddish-brown, pointed, narrow 4-6 mm long; leaf scars crescent-shaped, narrow.

Leaves. --Deciduous, simple, alternate, circular in outline with 3-5 rounded lobes and smaller lobes or rounded teeth, 2.5-5 cm across, narrow spaces between lobes, angular, margin hairy, light green; petiole 1.5-2.5 cm long.

Flowers. --April-May. Perfect. Flowers in drooping clusters

of 2-4, each flower with 5 white recurved sepals 6-7 mm long; 5 short, white petals form a tube around the stamens, 5 stamens 8-9 mm long, ovary below the sepals; stigma green.

Fruit. -- July-August. Berries in drooping clusters along the underside of the arched stem; dark purple and sweet when ripe, globular, 8-12 mm diameter. Seeds black, small, oval, numerous, 2.5-3.5 mm long, flattened, granular.

Habitat. -- The wild gooseberry grows in pastures, fence rows, and woodlands and prefers rich soil.

Ethnic Remarks. -- Ribes is derived from the Danish name Ribs, the name of the red currant; missouriense concerns the state of Missouri (Stephens, 1969). The plant affords excellent cover for mammals and birds and many birds, such as brown thrashers and cardinals build nests in the dense bushes. In autumn the low arching branches catch fallen tree leaves, hold moisture, and protect the soil from erosion.

The berries are excellent for pies, preserves, and jellies. I have gathered them in our pastures on my father's farm in Crooked Creek Township of Cumberland County and can testify to their merit.

Gooseberry pie was famous in colonial times and in their Journal, Lewis and Clark recorded feasting on a great variety of wild gooseberries that were more pleasing to the palate than those from their home gardens in Virginia (Medsger, 1939).

An excellent wine can be made from gooseberry fruits. The fruits can be preserved by drying and were used by various tribes of American Indians for making pemmican (Hall, 1973).

Hamamelidaceae--The Witch-Hazel Family

Hamamelis virginiana L.

Folknames. --Witch-Hazel, Spotted Alder, Winter Bloom, Snapping Hazelnut, Striped Elder, Tobacco Wood.

Habit. --Shrub 2-7 meters high, erect, branching.

Bark. --Grayish-black, scaly, with transverse lenticels.

Twigs. --Grayish-brown, slender, at first coated with a rusty pubescence, becoming glabrous or nearly so in the late fall; winter buds puberulent; transverse lenticels, the twigs taste astringent.

Leaves. --Deciduous, simple, alternate, obovate, oval or suborbicular, blades 5-14 cm long, 4-6 cm across, acute, rounded or retuse at the apex. The uneven wavy margin can be either toothed or sinuate. Short-petioled.

Flowers. --September-October. May be perfect, polygamous, or monoecious. The bright yellow, nearly sessile, flowers occur in axillary clusters. The four linear petals are generally crinkled, oval, ciliate, and pubescent on the outer surface.

Fruit. -- Maturing during the second season, the capsules are beaked by 2 persistent styles and are densely pubescent. Each capsule contains 2 oblong, black, bony seeds 7-10 mm long.

Habitat. -- Prefers rich well drained soil in the shade of the forest.

Ethnic Remarks. -- Hamamelis comes from two Greek words, "hama" and "melis." "Hama" means "at the same time" and "melis" means "a fruit." These two words were used because the flowers appear in late fall when the fruits of the previous year are ripe. The species name virginiana refers to the state of Virginia. The common name witch hazel came from those who once attributed occult powers to this species (Weiner, 1972).

The American pioneers believed that the location of underground streams could be determined by using a witch-hazel fork. When a well was about to be dug a slender fork of this species was cut and carved with one branch of the fork in each hand in an upright angle over the general area where the well was to be dug. The fork was supposed to bend downward when an underground stream was crossed. In areas where witch-hazel could not be found a peach tree fork was thought to be a satisfactory substitute.

The branches are distilled to create an aqueous extract, containing 15% ethyl alcohol that is commonly sold as "witch hazel" (Deam, 1932).

As a medicinal it is an old time remedy that is still quite popular. The American Woodland Indians used it in the form of a poultice for bruises and external irritations. The tea made from the leaves and twigs can be used as an effective mouthwash for conditions of irritation and as a vaginal douche in treating simple vaginitis. The recommended dose for the tea is a teaspoonful of the bark or leaves, cut fine or powdered to a cup cup of boiling water and sipped during the day (Meyer, 1970). An ointment made from lard, and a decoction of apple tree bark, witch hazel bark, and white oak bark can be prepared as a valuable treatment for the irritation and itching of piles.

The Iroquois Indians used a decoction of the leaves, sweetened with maple sugar as a beverage with their meals (Fernold, Kinsey, Rollins, 1943).

Witch-Hazel extract has astringent, tonic and sedative properties and is an excellent household remedy for external use. For varicose veins it is applied on a lint bandage and kept constantly moist (Wren, 1907).

The Menominees of Wisconsin prepared a witch hazel liniment by boiling the leaves. A decoction made from the boiled twigs was used for backache. The Potawatomis employed steambaths by placing the twigs in water with hot rocks for treating muscular aches. The Mowhawks used a wash made of steeped witch hazel bark for treatment of bruised eyes. The American Medical Association noted witch

hazel as being useful for treating piles, internal hemorrhages, and eye inflammations.

Witch hazel leaves were entered in the U.S. Pharmacopoeia from 1862 through 1916 and in the National Formulary from 1916 to 1955 (Weiner, 1972).

According to Kloss (1973) witch hazel is an antiphlogistic. It is valuable in stopping excessive menstruation and hemorrhages from the stomach, lungs, uterus, and bowels. As a poultice or wash it is useful for all external inflammation, bed sores, and infamed eyes. It can be used as a douche preparation for gonorrhoea, leucorrhoea, and whites.

Hippocastanaceae -- The Horsechestnut Family

Aesculus glabra Willd.

Folknames. -- Ohio Buckeye, Fetid Buckeye, Western Buckeye.

Habit. -- Small tree up to 30 meters in height, short slender trunk with a broad, deep, rounded crown.

Bark. -- Dark gray, thick, furrowed, scaly with short flat ridges.

Twigs. -- Grayish-yellow to reddish-brown, rigid, coarse. Terminal bud conical, reddish-brown, 1-1.2 cm long, pointed, lateral buds smaller; leaf scars large and inversely triangular in shape.

Leaves. -- Deciduous, palmately compound, opposite, usually 7 leaflets; leaflets elliptic to obovate, 8-12 cm long, sharp pointed apex, irregularly and finely toothed margin, wedge-shaped base, yellowish-green above, paler underneath. Stout petiole, 10-16 cm long, enlarged at base.

Flowers. -- April-May. Greenish-yellow, perfect, small, found in pyramidal or cylindric clusters 10-12 cm long on the end of

a main branch. The tubular, yellow-green calyx has five blunt pink tipped lobes. The four yellow petals are hairy on the outside, the upper two are small, curved or erect and have two orange spots inside, the two side petals are 13-15 mm long with an orange streak inside. Seven stamens. Ovary cylindrical, white, hairy, style green, stigma red.

Fruit. --September. Tan, rounded, prickly capsule 3-5 cm long, containing irregularly globular shiny dark brown seeds with a pale scar, seeds about 2-2.5 cm in diameter.

Habitat. --Prefers rich moist soil, ravines, river bottomland and the banks of streams.

Ethnic Remarks. --Aesculus is an old name for a European nut-bearing tree, while glabra pertains to the smooth leaf surface (Stephens, 1969).

The reddish-brown seeds are slightly poisonous. There is an old superstition that carrying a buckeye in your pocket will prevent rheumatism (Stephens, 1969).

The toxic substance found in the starchy meat of the seeds acts on the nervous system. Some Indian tribes used the seeds as food after a long leaching process to remove the poison. When essential for survival, the crushed twigs and seeds can be stirred into ponds to intoxicate fish and cause them to float to the surface (Hall, 1973).

An infusion of the seeds or bark can be used to treat skin sores and ulcers. The flowers have been employed for treating rheumatism. The bark and fruits have been used as a tonic and for treating fever. The fruits have also been used to treat neuralgia (Krochmal, 1973).

The powdered seeds can be utilized to make an excellent library paste that will repel all insects (Harlow, 1957). The ground seeds are used in preparing bile esculin azide agar which is important in microbiology for selective isolation, identification, and enumeration of Gram positive Streptococcus bacteria.

Juglandaceae--The Walnut Family

Carya cordiformis (Wang.) K. Koch

Folknames. -- Bitternut Hickory, Pignut Hickory, Swamp Hickory, Bitter Pecan Tree.

Habit. -- A somewhat large tree attaining a height of 20-30 meters high with a long straight trunk and a round-topped crown.

Bark. -- Dark gray, close, shallowly fissured with narrow ridges and tight flakes.

Twigs. -- Grayish-brown, somewhat pubescent, rigid, coarse; numerous elongated lenticels; long-pointed terminal bud, about 2 cm long, yellow, flattish, glandular, lateral buds smaller, often superposed, 4 angled; large, conspicuous, triangular leaf scars.

Leaves. -- Deciduous. Pinnately compound, alternate, 15-30 cm long with 7-11 leaflets, ovate-lanceolate to lanceolate, 8-15 cm long, sharply pointed apex, toothed margin, bright green; slender, hairy, petiole about 6 cm long.

Flowers. -- May. Monoecious. Staminate flowers in drooping

catkins 8-10 cm long, in clusters of 3's on a stalk, scales 3-lobed, hairy, 4 stamens, bearded yellow anthers. Pistillate flowers solitary or 2-3 in a cluster, green ovary with short hairs and yellow scurf, barrel-shaped, 6-10 mm long, ridged with 2 stout green stigmas.

Fruit. --October. Brown, globular, 2.0-3.5 cm long, 4-winged above the middle, thin husk, yellow glandular-dotted, splitting halfway to the base; nut tan, globular, nearly smooth, small, thin-shelled; very bitter kernal.

Habitat. --Grows in low wet woodlands or near streams, also found on high dry uplands. Prefers rich soil.

Ethnic Remarks. --Carya is the classical Greek name for the walnut, while cordiformis, which means "heart-shaped," pertains to the shape of the nut. The stout wood is used for tool handles, implement parts, barrel tops and ski poles, and was once made into ox yokes and barrel hoops. The bitter nut is not palatable for humans, but squirrels store and eat great quantities of them. The pecan often hybridizes with this species resulting in a tree called the "hican". Some of these hybrids produce a large, sweet nut (Stephens, 1969).

In east central Illinois hogs are sometimes fattened on these abundant nuts (thus the common name pignut).

Tea made from the inner bark and leaves of hickory has laxative properties and is useful in purifying the system; it is also useful

for washing ulcers, and sores and in curing diarrhea and colitis. An enema preparation for colitis can be made by adding a heaping teaspoonful of the chopped inner bark and/or leaves to a quart of boiling water and allowing it to simmer for fifteen minutes, then straining the solution (Kloss, 1973).

The inner bark produces a yellow dye that was used to color clothing in pioneer times. The wood is a favorite for fireplaces and wood burning stoves for it produces nearly as much heat as an equal amount of coal. In the green state hickory wood is used to smoke hams, bacon, cheese, fish, and almonds.

Carya illinoensis (Wang.) K. Koch

Folknames. --Pecan, Sweet Pecan.

Habit. --Medium sized tree attaining a height of 30 meters with upwardly arched or sometimes spreading branches and a round topped crown.

Bark. --Dark gray with long, flat ridges and shallow furrows.

Twigs. --Grayish-brown, pubescent when young, coarse; buds flattened, brown, egg-shaped, pubescent; terminal buds larger than lateral buds; large shield-shaped leaf scars.

Leaves. --Deciduous, pinnately compound, alternate, 30-75 cm long with 7-13 leaflets, leaflets narrow, elliptic to egg-shaped, with long often curved tip tapering to a point, rounded or tapered base, 6-10 cm long, 2.54-4 cm wide, serrate margin, blade yellow green; slender, hairy, petiole 4-6 cm long.

Flowers. --April-May. Monoecious. Male catkins in 3's arising from buds of last year's growth, 8-12 cm long with small green flowers, each having an awl-shaped bract at the base, 3-6 stamens with large, yellow, hairy anthers; female flowers in clusters

or solitary; ovary barrel-shaped, 3 mm long, green, 4-angled with large yellow-green, 2-lobed stigma.

Fruit. --October-November. Brown, cylindric, 3-5 cm long with thin, winged husk made up of 4 sections that split apart at maturity; nut light brown with dark markings, thin shelled, pointed at both ends; kernel sweet, edible.

Habitat. --Found along streams and on floodplains, usually in rich moist soil.

Ethnic Remarks. --Carya is the classical Greek name for the walnut and illinoensis pertains to the state of Illinois. The wood is used for wagon wheels and for fuel (Stephens, 1969).

Pecan nuts are quite tasty and valuable from a nutritional standpoint. At present they are used widely in baking fruitcakes and cookies and in New Orleans praline candy and pecan pie. Domestic varieties with larger nuts have been developed and great quantities of domestic pecans are harvested annually in groves from Georgia to Texas. Thomas Jefferson was among the first men who cultivated pecan trees. In Illinois wild pecan trees are usually found along the larger rivers in the southern half of the state. I have found them along the Wabash, the Embarras, the Illinois and the Mississippi rivers.

Pecans were a valuable food source providing protein for early Indians in Illinois and were gathered in huge quantities to be stored

for winter use. Pecan hulls have been identified in material found at the Koster site in the lower Illinois River Valley (Asch, et al., 1972). Winters (1969) indicates that excavations at the Riverton site east of Palestine, Illinois also unearthed charred fragments of pecan nuts.

NUTRITIONAL ANALYSIS OF NUTS (EDIBLE PORTION)

SPECIES	FOOD ENERGY ^a Cal/ 100g	COMPOSITION (in %)							SOURCE
		Water	Crude protein ^b	Fat	DRY BASIS			Tannin ^d	
					Carbo. ^c	Fiber	Ash		
<i>Carya illinoensis</i> (pecan)	687	3.4	9.5	73.7	12.7	2.4	1.7		Watt and Merrill (1963)
<i>C. illinoensis</i> (pecan)*	697	2.7	8.3	74.7	13.2	2.1	1.7		Henry (1950)
<i>C. illinoensis</i> (pecan)	678	3.7	10.8	72.5	13.2	1.8	1.8	0.3	Friedemann (1920)
<i>C. ovata</i> (shagbark-hickory nut)	696	2.2	11.3	74.4	10.8	1.5	2.0	0.5	Wainio and Forbes (1941)
<i>C. ovata</i> (shagbark-hickory nut)	681	3.4	11.6	72.7	11.8	2.1	1.8		Peterson and Bailey (1913)
<i>C. sp.</i> (hickory nut)	673	3.3	13.7	71.0	11.3	2.0	2.1		Watt and Merrill (1963)
<i>Corylus americana</i> (hazelnut)	630	2.6	22.5	61.4	11.2	2.2	2.8		Wainio and Forbes (1941)
<i>C. sp.</i> (filbert) ^e	634	5.8	13.4	66.2	14.5	3.2	2.7		Watt and Merrill (1963)
<i>Juglans cinerea</i> (butternut)	625	4.5	24.8	64.1	8.0		3.1		Woods and Merrill (1900)
<i>J. nigra</i> (black walnut)	628	3.1	21.2	61.2	13.5	1.8	2.4		Watt and Merrill (1963)
<i>J. nigra</i> (black walnut)	621	2.9	24.8	60.2	11.2	1.0	2.8	0.2	Wainio and Forbes (1941)
<i>Quercus alba</i> (white oak acorn)	221	47.3	5.3	6.3	83.2	2.5	2.6	5.6	Wainio and Forbes (1941)
<i>Q. alba</i> (white oak acorn)	255	39.7	6.3	6.8	82.6	1.8	2.6	4.4	Korstian (1927)
<i>Q. macrocarpa</i> (bur-oak acorn)			7.9	8.3	80.9		2.9		Lund and Sandstrom (1943)
<i>Q. palustris</i> (pin-oak acorn)			5.9	26.1					Earle and Jones (1962)
<i>Q. rubra</i> (red oak acorn)	299	38.2	5.6	20.8	68.1	3.1	2.4	9.8	Wainio and Forbes (1941)
<i>Q. rubra</i> (red oak acorn)	328	32.9	6.1	22.5	66.4	2.4	2.6	7.4	Korstian (1927)

^a Based on fresh, edible portion; calculated with the formula:

Cal/100 g = (crude protein/100 g)x3.47 + (fat/100 g)x8.37 + (carbohydrate/100 g + fiber/100 g)x4.07, as recommended by Watt and Merrill (1963:159,160).

^b All protein percentages calculated by multiplying the total nitrogen percentage by 5.30, as recommended by D. Jones (1913:13) and Watt and Merrill (1963:159,161).

^c Nitrogen-free extract, fiber excluded; calculated as the difference between 100% and the sum of the percentages of crude protein, fat, fiber and ash.

^d Tannin included as a fraction of nitrogen-free extract.

^e Based on mean composition of six pecan varieties.

^f Probably based on composition of one or more nonnative, cultivated species of *Corylus*.

Carya laciniosa (Michx.) Loud.

Folknames. --Kingnut Hickory, Bottom Hickory, Bullnut Hickory, Bigbud Hickory.

Habit. --A large tree attaining a height of 40 meters with a long straight trunk and a high cylindrical crown.

Bark. --Gray, thick, peeling off into long, broad plates that spread away from the trunk.

Twigs. --Gray-brown to orange-brown, pubescent, coarse, inconspicuous lenticels; terminal buds ovoid, 2.5 cm long, bluntly pointed, covered with about 10 scales, lateral buds smaller; large, heart-shaped leaf scars.

Leaves. --Deciduous. Pinnately compound, alternate, 30-50 cm long with 7-9 leaflets, oblong-lanceolate, 10-20 cm long, sharply pointed, toothed margin, blade dark yellow green; petioles and rachis remaining on the tree after the leaflets have fallen.

Flowers. --April. Monoecious. Staminate flowers in yellowish green, slender, drooping, catkins 12-20 cm long, in clusters of 3 on a stalk, scales 3-lobed, hairy, 4 stamens with yellow, hairy anthers.

Pistillate flowers in pairs at the end of new growth, ovary green, 3.5-4 mm long, barrel-shaped, ridged, hairy with rough, 2-lobed, greenish-yellow stigma.

Fruit. --September. Brown, globular, 4-7 cm long, 4-sectioned husk, indented between sections, thick, woody, splitting to the base; pale brown nut, egg-shaped, 4-angled; sweet edible kernel.

Habitat. --Prefers deep, rich bottomlands and fertile plains and hillsides.

Ethnic Remarks. --Carya comes from the classical Greek name for the walnut, and laciniosa pertains to the split, shaggy bark. The strong, straight grained wood is used for skis, tool handles, implement parts, and barrels. The kingnut is so named due to its extra large nuts (Stephens, 1969). It is difficult to transplant because of its long taproot and needs to be started from seeds (Li, 1972).

According to Winters (1969), excavations at the Riverton site east of Palestine, Illinois, near the Wabash River unearthed a very fine quartzite nutting stone from the plow zone. The stone had two nut cracking pits on one face and a single pit on the opposite face. Nuts were certainly a very important food source of the Riverton peoples, for charred fragments of hickory nuts, walnuts, butternuts, acorns, hazel nuts, and pecans were found at the Riverton site. Woodland Indians collected sap from hickory trees and boiled it down to

make syrup and sugar in the same way sugar maple trees were tapped. The Indians made a fermented drink called "powcohiccora" by pounding hickory nuts and letting the mash "set" for a while (Harlow, 1957).

Carya ovata (Mill.) K. Koch

Folknames. --Shagbark Hickory, Shellbark, Scalybark, Upland Hickory.

Habit. --A large tree attaining a height of 40 meters with a long straight trunk and a high oblong-cylindrical crown.

Bark. --Gray, thick, separating into thin strips that curl outward giving a shaggy appearance.

Twigs. --Grayish-brown, coarse, pubescent when young, many conspicuous elongated lenticels; terminal buds egg-shaped, 12-18 mm long, smooth, brown, outer scales often with a long point; inner scales tan, downy, become large and colorful when bud opens in the spring; lateral buds dark brown, smaller; large heart-shaped leaf scars.

Leaves. --Deciduous. Pinnately compound, alternate, 20-35 cm long with 5-7 leaflets, elliptic to oblong-lanceolate, 10-15 cm long, sharply pointed, tapered or rounded base, margin toothed and ciliate, dark yellow-green blade; petiole hairy, 9 cm long.

Flowers. --April. Monoecious. Staminate flowers pubescent, green in drooping catkins in 3's, 10-12 cm long; scales in 3 parts,

bristle-tipped, 4 stamens with bearded, yellow anthers; pistillate flowers solitary or in clusters of 2-3, green, barrel-shaped ovary 8-9 mm long, ridged, covered with small scales, large, curved, brown stigmas.

Fruit. --September-October. Brown, globular, 3.5-6.0 cm long, thick husk splitting into 4 sections at maturity; nut white, ellipsoid to broadly ovoid, ridged, thin shelled; large sweet kernel.

Habitat. --Common on low moist hillsides, on swamp borders, and along rivers and streams. Prefers light, well-drained loamy soil.

Ethnic Remarks. --Carya comes from the classical Greek name for the walnut, ovata refers to an egg shape, probably pertaining to the shape of the nut.

The wood is of excellent quality and is used for barrels, skis, tool handles, and walking sticks (Stephens, 1969).

Well seasoned hickory was used to make the famous flat bow of the Woodland Indians. The bow was about four feet long, two inches wide at the middle, rectangular in cross section, and tapered off toward each end. A popular decoration form was a scallop design carved along one edge of the lower limb and along the opposite edge of the upper limb. When the tree was cut, a block of wood bigger than the size of the bow was removed paying careful attention to the grain of the wood. A crooked knife was used to shape the bow to its

bristle-tipped, 4 stamens with bearded, yellow anthers; pistillate flowers solitary or in clusters of 2-3, green, barrel-shaped ovary 8-9 mm long, ridged, covered with small scales, large, curved, brown stigmas.

Fruit. --September-October. Brown, globular, 3.5-6.0 cm long, thick husk splitting into 4 sections at maturity; nut white, ellipsoid to broadly ovoid, ridged, thin shelled; large sweet kernel.

Habitat. --Common on low moist hillsides, on swamp borders, and along rivers and streams. Prefers light, well-drained loamy soil.

Ethnic Remarks. --Carya comes from the classical Greek name for the walnut, ovata refers to an egg shape, probably pertaining to the shape of the nut.

The wood is of excellent quality and is used for barrels, skis, tool handles, and walking sticks (Stephens, 1969).

Well seasoned hickory was used to make the famous flat bow of the Woodland Indians. The bow was about four feet long, two inches wide at the middle, rectangular in cross section, and tapered off toward each end. A popular decoration form was a scallop design carved along one edge of the lower limb and along the opposite edge of the upper limb. When the tree was cut, a block of wood bigger than the size of the bow was removed paying careful attention to the grain of the wood. A crooked knife was used to shape the bow to its

proper size and it was smoothed with a scraper. The Menomini rubbed their bows with bear grease after the smoothing was completed. Bowstrings were fashioned out of nettle fiber, sinew, or the skin from the neck of the snapping turtle (Ritzenthaler, 1970).

Considering their seasonal abundance, storability, caloric value, and complete and high protein content, hickory nuts are an example of a first class wild plant food with a dietary contribution parallel to that of meat. If it were necessary to rely on a single wild plant food in central Illinois, hickory nuts would probably be the best choice. In comparison with hickory nuts, acorns are inferior from a nutritional standpoint and require special processing to make them edible. Black walnuts and butternuts are just as valuable from a nutritional standpoint as hickory nuts, however they are usually not as abundant as hickory nuts. Hickory trees are often found in large groves, while walnut trees tend to be more widely spaced in a forest due to a root-produced hormone called jugalone that inhibits the growth of other walnut trees. More labor is involved in preparing walnuts for they retain their husks when ripe and these husks must be removed to get at the nut. In comparison, the husks of hickory nuts split naturally and release the nuts or they can easily be separated by hand. Excavations at the Koster site in the lower Illinois River Valley showed hickory nuts to be the most abundant type of nut used by these early Indians. Hickory nuts occurred in 100% of the samples containing

nuts and constituted over 90% of the total nut shell weight.

Acorns were found in 52% of the samples and black walnuts in 24% of the samples, but each constituted only about 2% of the sample by weight. Pecans occurred in 35% of the samples and made up about 1% by weight. Hazelnuts were found in less than 5% of the samples and made up only about 0.1% of the total sample weight (Asch et al., 1972).

Juglans cinerea L.

Folknames. --Butternut, Oil Nut, White Walnut.

Habit. --A small to medium sized tree reaching a maximum height of 30 m, with a short trunk and broad, often irregular, round-topped crown

Bark. --Gray, deeply fissured into wide smooth ridges.

Twigs. --Grayish-tan, hairy when young, becoming smooth, rigid, bitter to taste, roughened by leaf scars, the large three-lobed leaf scars have a hairy fringe above them. The terminal bud is oblong-conical, blunt, somewhat flattened, downy, brown; the lateral buds are ovoid, smaller and often superposed.

Leaves. --Deciduous. Alternate, pinnately compound, 11-19 leaflets that are oblong-lanceolate, pointed at apex, toothed margin, 6-12 cm long, finely hairy above, glandular and hairy below; petioles and rachis viscid-hairy.

Flowers. --May. Monoecious. Staminate flowers in unbranched catkins 5-8 cm long. Pistillate flowers in catkins containing 5-8 flowers.

Fruit. -- Yellow-green at first, turning brown, ovoid-oblong, 4-6.5 cm long, viscid-hairy; nut thick-shelled, pointed at one end with 4-5 ribs, kernel edible.

Habitat. -- Grows well in low rich woods, river banks, and lower fertile hillsides.

Ethnic Remarks. -- Juglans comes from the Latin, Jovis glans, meaning "the acorn of Jove," and cinerea refers to the ash-gray color of the bark (Stephens, 1969).

The butternut produces a beautiful, unique wood that is hard, durable, and richly tan in color. In the past it was used for furniture and cabinets but is quite scarce in Illinois at present. I can testify to its beautiful grain and ability to take a fine finish for my grandmother has cabinet work made of native Illinois butternut.

The kernel is sweet, somewhat oily, and very tasty and nutritious. One of my boyhood culinary delights was the maple syrup-butternut fudge my aunt prepared.

The Potawatomis drank a tea made from the inner bark for upset stomachs, while the Meskwakis used the bark tea as a mild laxative. The Menominee Indians made a syrup from the butternut tree that was taken as a standard treatment for digestive disorders.

This plant has been used as a laxative in domestic American medicine since before the Revolutionary War. The inner bark of the

roots was listed in the U.S. Pharmacopoeia from 1820 to 1905 for its laxative and tonic effects.

The Seneca tribes mixes dried pulverized kernels of butternut and hickory with dried, pulverized bear or deer meat to make a baby food. The dried mixture was added to boiling water and then given to hungry babies.

A. C. Parker, an anthropologist of Seneca Iroquois ancestry, described an Indian nursing bottle as follows:

The nursing bottle was a dried and greased beargut. The nipple was a bird's quill around which was tied the gut to give proper size. To clean these bottles they were untied at both ends, turned wrong side out, rinsed in warm water, thrown into cold water, shaken and hung in the smoke to dry (Weiner, 1972).

Kloss (1973) indicates that butternut has tonic, astringent, cholagogue, anthelmintic, and alterative properties. It is an excellent slow remedy for sluggish liver, fevers, colds, and la grippe and it will expel worms from the intestines. According to Krochmal (1973), oil pressed from butternut fruits is useful in treating tapeworms and fungus infections.

A dark grey-brown dye can be obtained from the inner bark and the nut-rinds of the butternut tree. Use of this dye was an old practice among country-folk and in the past it was commonly employed for coloring homespun woolen clothing. This butternut dye was used to color the garments of the Confederate soldiers during the Civil War. Due to this situation the term butternut became a nickname for a Confederate soldier (Saunders, 1934).

Juglans nigra L.

Folknames. --Black Walnut, American Walnut, Eastern Black Walnut, Walnut.

Habit. --A large tree growing to 50 m tall with a straight trunk and round-topped crown.

Bark. --Dark brown to grayish-black with deep furrows and blocky ridges.

Twigs. --Grayish-brown, rigid, stout, hairy when young; terminal buds flattened, irregular, 6-7 mm long, covered with fine brown hairs; lateral buds smaller, egg-shaped, covered with down; large shield-shaped leaf scars.

Leaves. --Deciduous, alternate, pinnately compound, 20-50 cm long with 11-23 leaflets that are irregularly toothed, ovate lanceolate, rounded at base, sharply pointed, 6-12 cm long. The yellow green blade is smooth above and covered with soft hairs below and is fragrant when crushed. The hairy petiole is about 7 cm long.

Flowers. --Early May. Monoecious. Male catkins solitary or in clusters on last year's growth, 6-9 cm long, composed of numerous

flowers. Female flowers in clusters of 2-4 on the ends of new growth, egg-shaped, 6-7 mm long, velvety, green with two rough, spreading stigmas.

Fruit. --October. Yellow-green at first, later dark brown, thick husked, round to slightly pear-shaped, 4-5 cm across, nuts black, rough, more or less rounded, slightly compressed, about 3 cm across, edible kernel.

Habitat. --Grows well in rich bottomlands, on fertile hills and in upland woods.

Ethnic Remarks. --Juglans is derived from the Latin, Jovis glans, which means "the acorn of Jove" and nigra pertains to the dark wood and black nut (Stephens, 1969).

Walnut timber is a valuable item of commerce, bringing 3-4 dollars per board foot. The wood is hard and takes a beautiful finish. It is used for furniture, wall panels, exposed beams, gunstocks, cabinets, and musical instruments. The green husks of the nut contain a dark stain that was used by the pioneers as a dye and it is hard to remove this walnut stain from clothes or hands (Stephens, 1969).

A tea made by adding a heaping teaspoonful of the granulated root bark to a cup of boiling water will expell all kinds of worms from the intestinal tract and is said to be a remedy for poisonous snake bites. Tea made from the leaves with honey added makes an excellent throat

and stomach remedy and is a treatment for profuse menstruation. The root bark or leaf decoction also is excellent for use as a douche. Wetting the fingers in walnut root bark tea and massaging the scalp once a day is said to help prevent the hair from falling out and gives it a dazzling lustre (Kloss, 1973).

During the American Revolution walnut inner bark was commonly used as a mild laxative. Walnut leaf infusions are used for getting rid of bed bugs. The fruit husks are said to be useful for treating ulcers, intestinal worms, and syphilis. The juice of the fruit is claimed to be beneficial for treating tapeworms, as a laxative, and as a gargle in treating diphtheria (Krochmal, 1973).

Lauraceae--Laurel Family

Lindera benzoin (L.) Blume

Folknames. --Spicebush, Spiceweed, Benjamin Bush, Allspice-bush.

Habit. --Shrub, growing in clumps, 1-3 meters high.

Bark. --Light, gray-brown, smooth with light colored lenticels.

Twigs. --Grayish-green or brown, flexible, slender. Buds small, globular, greenish-brown, solitary or clustered; leaf scars half-round; pith white.

Leaves. --Deciduous, simple, alternate, elliptic, sharply pointed tip, tapered base, 6-11 cm long, 3-5 cm wide, entire blade, dark green, thin, soft; petiole 10-12 mm long.

Flowers. --Early April. Dioecious. Each flower with 6 yellow sepals 2.5-3 mm long and lacking petals. Male flowers with 9 stamens, anthers yellow, small. Female flowers with green egg-shaped ovary and a brown stigma.

Fruit. --September. Bright red, oval, glossy, solitary or

clustered, 9-12 mm long, 6-8 mm thick, flesh thin, strong scent of spice. Seeds brownish-gray with dark blotches, oval, 7-8 mm long.

Habitat. --An undershrub found in wet woods and bottomlands (Tehon, 1942).

Ethnic Remarks. --Lindera is used in honor of Johann Linder, a Swedish botanist (1676-1723) while benzoin pertains to the similarity of the scent to that of Styrax benzoin (Stephens, 1969).

This shrub is of economic importance as an ornamental due to its bright yellow flowers and brilliant red fruit that appears in the fall. A spicy tea can be made by boiling the twigs of this shrub and was much used by the Woodland Indians and the pioneers. The crimson fruit was used during the Revolutionary War as a substitute for allspice. This use gave it the name of allspice-bush that has evolved to spicebush (Deam, 1932).

The plant was used in domestic medicine as a febrifuge and for stimulating perspiration. Women of the Rappahannock tribe used spicebush to relieve the pain and cramps that sometimes accompany menstruation. The oil was applied to the body to relieve pains of rheumatism. In the early 1900's the bark was used as a remedy for worms.

Spicebush belongs to the aromatic laurel family that gives us camphor and cinnamon and is closely related to the "official" benzoin

tree that is native in southeastern Asia. The benzoin tree contains the balsamic resin benzoin that is described as an antiseptic, diuretic, stimulant, and an expectorant.

It appears that our native species also contains benzoin. A gummy balsam can be obtained from both the native and Asian plants. Some Hindus burn this aromatic gum as an incense in their temples (Weiner, 1972).

Sassafras albidum (Nutt.) Nees

Folknames. --Sassafras, Saxifraxtree, Aguetree, Cinamon Wood, Red Sassafrass, Saxifras, Smelling stick, White Sassafras.

Habit. --Tree to 20-40 meters, with a short trunk and more or less contorted branches forming a rounded crown.

Bark. --Reddish-brown, thick furrowed, with long firm, flat ridges.

Twigs. --Slender, brittle, yellow-green, smooth, sparsely covered with lenticels, crescent-shaped leaf scars. Large egg-shaped terminal bud, pointed, 6-8 mm long, reddish-green; lateral buds smaller, somewhat divergent. Pith white.

Leaves. --Deciduous alternate, some oval and entire 8-12 cm long others 2-5 lobed at apex, bright green above, pale underneath.

Flowers. --April-May. Dioecious. Yellowish-green, 7 mm broad, in loose drooping racemes 3-5 cm long. Staminate flowers lack staminodes and rudimentary pistil.

Fruit. --Late August. Dark blue, bloomy, shiny, ovoid drupe, 1 cm long on a bright red, club-shaped stalk.

Habitat. -- Fencerows, upland and hillside woods, thickets.

Ethnic Remarks. -- Sassafras comes from the name Salsafras given to the tree by the French in Florida. Albidum means white, referring to the wood (Stephens, 1969). All parts of the plant are aromatic and can be boiled to make tea, but the bark of the root is mostly used. The root bark is also used to obtain an extract for soap, perfume, root beer, and tooth paste.

The wood is used as posts, rails, and in boatbuilding due to its resistance to rotting and its light weight (Jaques, 1941).

The Rappahannock tribe of Virginia drank an infusion of sassafras roots to reduce fever and to hasten eruption of the rash in measles. The same remedy was also used by the Houmas. Early in the history of the nation sassafras became one of the most important articles of export. Most of the shipments went to England for use in treating venereal disease, colic, and pain.

The Spanish Conquistadors discovered sassafras when they conquered Florida in 1538. They mistook the sassafras scent for cinnamon, a spice that grows in Ceylon. Sassafras was taken to Spain around 1560 where it quickly acquired a good reputation for curing various diseases.

Sassafras has been a useful "tonic" in domestic medicine. Rural doctors were fond of sassafras tea for treating high blood pressure and for increasing perspiration in colds. The Pennsylvania Germans employed a tea made from the flowers to reduce fevers and used the berries

to make a wine for colds. Derivatives of this plant are still widely used in commercial products, such as flavorings, mouthwashes, and chewing gum. Safrole, the aromatic oil from the sassafras plant is used as an antiseptic agent in dentistry (Weiner, 1972).

Due to their muciliginous quality, the leaves of sassafras are used in the South to prepare a thickening called "gumbo file". The dried leaves are rubbed into a powder and sifted to remove stems and veins. The aromatic powder can be used in place of flour or cornstarch to thicken stews, soups, and gravies. It is an effective thickening agent and also imparts a piquant flavor (Hall, 1973).

The bark has been used to dye wool an orange color (Harlow, 1957).

Leguminosae--The Pea Family

Cercis canadensis L.

Folknames. --Redbud, Judas Tree.

Habit. --A small tree attaining a height of 12 m. with a short trunk and a broad round crown.

Bark. --Reddish-brown, thin, fissured with short thin blocky plates; on young trees the bark is gray and smooth.

Twigs. --Dark brown to nearly black, slender, smooth, shiny, flexible, covered by many tiny lenticels; terminal bud absent; lateral buds small, rounded, stalked, often two at a node; crescent-shaped leaf scars.

Leaves. --Deciduous, simple, alternate, heart-shaped, with rounded base and abruptly pointed tip, entire margin, 5-7 main veins from the base; yellow-green blade 8-14 cm long and 5-12 cm wide; petiole 4-6 cm long.

Flowers. --Mid-April. Perfect. Developing from winter buds in clusters of 4-8 on red stalks, each flower 10-13 mm long; 5 purplish sepals, 5 bright rose-purple petals, 10 stamens with small rose-colored

anthers, pod-shaped ovary with red style and stigma.

Fruit. --August. Small short-stalked pod 6-8 cm long, 1.2 cm wide, light brown to rosy pink; 6 broadly ovoid, flattened, brown seeds in each pod.

Habitat. --Prefers rich moist soil, on hillsides, in open woodlands, or along borders of streams.

Ethnic Remarks. --Cercis comes from the ancient name for the Judas Tree of the Orient, while canadensis pertains to Canada (Stephens, 1969).

The beautiful abundantly produced flowers of this tree add hues of lavender lace to the April woods in East Central Illinois.

The flowers have a tart acid flavor and can be added to salads or pickled in the bud like capers. The buds, flowers and young pods are tasty when fried in butter or made into fritters.

According to an ancient legend, Judas hanged himself on a tree of the Asiatic species of this genus. The flowers were supposed to have been white before this took place; but the tree blushed in shame, and the blossoms have been pink ever since. There is "still" a white-flowered variety of both the native and Asiatic trees (Harlow, 1957).

Gleditsia triacanthos L.

Folknames. -- Honey Locust, Thorn Tree, Three Thorn Acacia, Thorny Locust, Honey Shucks.

Habit. -- A medium-sized tree reaching a height of 45 m usually with a short trunk and long drooping branches that form a round-topped broad crown.

Bark. -- Grayish-brown to black, thick, deeply fissured into narrow ridges or long thin plates, often with dense, long, branched, thorns.

Twigs. -- Reddish-brown to greenish-brown, stout, smooth, shiny, rigid, enlarged at the nodes, with reddish-brown stout thorns; terminal bud absent; minute lateral buds are brownish, smooth, superposed, 3-5 at a node; leaf scars V-shaped.

Leaves. -- Deciduous. Pinnately or twice pinnately compound, alternate, 14-20 cm long, pinnately compound leaves with 20-30 oblong-lanceolate leaflets, each 2-3.5 cm long; twice pinnately compound leaves with 8-14 pinnae each with 18-20 leaflets, each 8-20 mm long; leaflets lanceolate-oblong, rounded at apex and base, somewhat serrate on margin.

Flowers. --May. Unisexual or perfect, small, short-stalked, the staminate and pistillate on separate trees. Male flowers in short hairy racemes about 5 cm long. Female or perfect flowers in few-flowered solitary racemes about 7 cm long.

Fruit. --September. Brown, twisted, pendant, pods 20-35 cm long, 3 cm wide, flat; seeds 6-17, brown, ovoid, 10-11.5 mm long, flat, hard.

Habitat. --Prefers rich, deep soil in bottomlands.

Ethnic Remarks. --Gleditsia refers to Johann G. Gleditsch, German botanist, 1714-1786, while triacanthos refers to the 3-branched thorns.

The strong durable wood is often used for fence posts (Stephens, 1969).

The hard seeds of this tree are usually not considered edible, however, the honey-flavored gelatinous pulp that surrounds the seeds in the pods is edible and there is record of the use of this pulp for food by historic Indians. The pulp is known to have been used in making sugar and beer (Asch, et al., 1972).

The strong sharp thorns of this tree can be used as needles and awls. The presence of these thorns makes this tree undesirable for lawn plantings, however a thornless variety has been developed for ornamental purposes.

The seeds contain the alkaloid gleditschine which causes loss of reflex activity and produces stupor. Stenocarpine, which is also found in the seeds, has been used as a local anesthetic. The seeds also contain some cocaine.

Gymnocladus dioicus (L.) K. Koch

Folknames. -- Kentucky Coffee-tree, Coffeebean, Nickertree, Stumptree, Coffeenut.

Habit. -- Tree with a rounded top and coarse branches. 20-30 meters.

Bark. -- Deeply fissured, dark gray, scaly.

Twigs. -- Early twigs pubescent. Brown with orange lenticels; pith salmon-colored, large. Buds in a silky lined hidden cavity; large irregularly heart-shaped leaf scars.

Leaves. -- Deciduous with bipinnately, compound, alternate leaves; entire-margined leaflets that are elliptically ovate and sharply pointed at the apex.

Flowers. -- Appear in mid-May. Dioecious. Staminate flower a terminal raceme 7-10 cm long. Pistillate flower a terminal raceme 15-25 cm long.

Fruit. -- Appears in October and remains on tree through winter. The flat, heavy, bulky purplish-brown pod is 10-15 cm long and 4-5

cm wide. The dark brown seeds are more or less rounded to flat, about 2 cm across.

Habitat. -- Bottomland woods along creeks and rivers.

Ethnic Remarks. -- Gymnocladus is derived from two Greek words, gymnos, "naked" and clados "a branch" referring to the few coarse branches; dioicus is used in reference to male and female flowers on separate trees (Stephens, 1969).

Kentucky coffee tree seeds were roasted and eaten like nuts by the Pawnee and Meskwoki tribes. Early settlers in Kentucky ground and roasted these seeds for use as a coffee substitute. Kentucky coffee tree beans never became a popular substitute for real coffee even though they made a fine caffeine-free beverage. Perhaps they would be well received if they were available in health food stores. An enema was prepared from the pulverized root bark of this tree as a certain remedy for severe cases of constipation (Weiner, 1972).

The journal of Major Long's expedition to the Rocky Mountains in 1819-20 states that during their stay in winter camp near Council Bluffs on the Missouri River, the party substituted Kentucky coffee tree seeds for coffee and found the beverage wholesome and palatable. Thomas Nuttall, the famous botanist, did research the following year near the mouth of the Ohio River and spoke highly of the agreeableness of the parched seeds as a food source, but remarked that as a substitute for coffee they were "greatly inferior to cichorium" (Saunders, 1934).

Robinia pseudoacacia L.

Folknames. -- Black Locust, Common Locust, Yellow Locust, White Locust, Acacia.

Habit. -- A medium-sized tree reaching a height of 25 meters with an open, narrow, oblong crown.

Bark. -- Reddish-brown to gray, thick, deeply furrowed with long flattopped ridges.

Twigs. -- Gray or reddish-brown, rigid, rather stout, brittle, somewhat angular, often zigzag, short stout spines in pairs at the nodes; terminal bud absent; lateral buds small with brown scales, white-wooly inside; triangular leaf scars.

Leaves. -- Deciduous, pinnately compound, alternate, 20-35 cm long, 9-19 leaflets, each leaflet oval with a rounded base and a small point on the rounded tip; blade light green on both sides with a few hairs below; petiole 4-5 cm long.

Flowers. -- June. Perfect. 10-30 in drooping racemes 10-20 cm long, each flower the shape of a butterfly, very fragrant, with a cup-shaped calyx, 5 white petals, the upper one erect, the side two

spreading and the lower two enclosing the stamens, 10 stamens with long filaments and small yellow anthers, a small, green, stalked, hairy ovary with a long curved style and a small stigma.

Fruit. -- August, usually remaining on the tree until winter. A dark brown, smooth, linear-oblong pod 5-10 cm long, 1.2 cm wide, 3-10 small dark brown mottled, bean-shaped seeds that are about 5 mm long, hard and smooth.

Habitat. -- Grows in a wide range of habitats, from rich moist soil to rocky, dry, sandy situations.

Ethnic Remarks. -- Robinia refers to Jean Robin, herbalist to Henry the IV of France and his son Vespasian; pseudoacacia means "false acacia" and pertains to its resemblance to the acacia.

The black locust is planted widely in America and Europe as an ornamental (Li, 1972). In fencerows and shelterbelts black locust trees help prevent erosion and add nitrogen to the soil through nitrifying bacteria found in the root nodules (Harlow, 1957).

The roots and inner bark are poisonous, however many birds eat the seeds (Stephens, 1969). Indians of the lower Illinois River Valley were known to boil the seeds and eat them (Zawacki and Hausfater, 1969). Some authorities indicate that the seeds are poisonous. It is possible that boiling in several changes of water would remove the poison. In either case I would not recommend them for eating.

The American Indians used the wood for bows and made a blue dye from the leaves. Since the wood does not shrink or swell very much with changes in moisture content, it is used in making dowels for holding wooden ships together (Harlow, 1957). The wood is used for fence posts and flooring due to its decay resistant properties.

The ethereal sweet fragrance of the blossoms is one of the dreamiest scents of springtime. I have often been enchanted by the wind drift of this redolence coming from the black locust grove near the campus pond.

Loranthaceae--Mistletoe Family

Phoradendron flavescens (Pursh) Nutt.

Folknames. --American Misteltoe, Birdlime, Misteltoe, Golden Bough.

Habit. --Shrub, parasitic on deciduous trees, 30-50 cm cm high.

Bark. --Dark green, wrinkled; inner bark brownish.

Twigs. --Olive-green, brittle, rigid, coarse; minute green buds; oval leaf scars.

Leaves. --Flat, leathery, dull-green, evergreen, simple, entire, opposite, elliptical and often widest near the outer end with a tapered base, rounded tip and a short stout petiole.

Flowers. --Dioecious bracted flowers arise on axillary spikes and bloom during the later part of October.

Fruit. --Clustered, globose, white, 4-6 mm in diameter, translucent, fleshy, sticky when bruised, causing them to stick to trees to which they are carried.

Habitat. --River bottoms and lowlands, parasitic mainly on Ulmus americana, Acer saccharinum, Acer saccharium and others occasionally.

Ethnic Remarks. --Phoradendron comes from two Greek words phor, a thief, because it is parasitic on trees, and dendron, a tree (Stephens, 1969). The genus name refers to its nature of being parasitic on trees.

Mistletoe has a tendency to concentrate materials found in its host. Some specimens have been known to yield twice as much potash and five times as much phosphoric acid as the wood of the host. Brazilians have found their native species to be useful in treating syphilis and in reducing swelling. Some physicians claim to have achieved good results in using mistletoe to treat cancer (Wheelwright, 1974)

The American Indians made a tea from the leaves of the mistletoe plant that was said to cause abortion when taken in large quantities and to prevent conception when taken in slightly smaller doses. Dr. W. H. Long, who possibly learned of the plant's use from the Indians, recommended it for domestic medicine due to its action on the uterus and its ability to stop bleeding after parturition. It has been demonstrated clinically that an extract of mistletoe causes increased blood pressure and uterine contractions when injected into the blood stream. At the turn of the century a case of poisoning from eating mistletoe berries was recorded in Tennessee (Weiner, 1972).

Kloss (1973) indicates that mistletoe has narcotic, antispasmodic, emetic, tonic, and nervine properties. It is a specific treatment for cholera or St. Vitus's dance and is a fine nervine, effective in epilepsy, convulsions, hysteria, delirium, nervous debility, and heart troubles.

Mistletoe was incorporated in Viking mythology and was also popular in Germany.

Balder, the Norse god of light was the son of Odin and the goddess Frigg. He was very beautiful and shed radiance around him and was very wise. To see or hear him was to love him.

For a long time Balder's life was filled with happiness and harmony. However, a time came when he was troubled by his dreams and presentiments of evil. When the goddess Frigg heard of this she, in an effort to protect Balder, begged every being and thing on earth--metal, fire, water, stones, minerals, plants, illnesses, beasts, birds, and venomous creatures--to swear to never harm Balder. All of them took this oath not to hurt him. From then on Balder was invulnerable and the other gods submitted him to various tests. They shot arrows at him, threw stones at him, and struck him with their weapons, but nothing did him any harm, to the hilarious joy of the company of gods.

As Loki watched the spectacle his heart became full of loathing. He took on the appearance of an old woman and went to see Frigg in her palace. Pretending ignorance, he wanted to know why the gods were amused so. She then told him that everything on earth had promised to spare Balder. "Everything? Really Everything?" said Loki.

"Have you forgotten nothing?" "I only overlooked one small plant," said Frigg. "It grows to the west of Valhalla and is called Misteltein (mistletoe). It seemed too young to ask to take an oath."

Without further questions Loki left Frigg, took on his normal shape, and hurried to gather the mistletoe from the indicated place. He then returned to the great meadow where the gods were hurling objects at Balder. He addressed Hod, who refrained from the sport because he was blind. "Why are you not taking part in the game?" Loki asked. "Why do you not throw something at Balder?" "It is because I cannot see," Hod said. "Besides, I have no weapon." "In that case," said Loki, "try this wand. Throw it. I will direct you." Hod took the branch of mistletoe and hurled it at Balder. It hit him and Balder fell dead. The other gods then wept bitterly at the loss of their fair comrade. They would have willingly punished Loki's crime right there on the spot, but the place where they were gathered was consecrated for peace (Guirand, 1972).

The custom of kissing under the mistletoe during Christmas owes its origin to this legend. After Balder's death by the mistletoe his mother Frigg, the goddess of love and beauty, said that mistletoe would never again be used for evil and that she would bestow a kiss on anyone who passed under the mistletoe. I can personally testify to the satisfaction derived from participating in this amorous custom.

Magnoliaceae--Magnolia Family

Liriodendron tulipifera L.

Folknames. --Tulip tree, Tulip poplar, Yellow Poplar, White Poplar, Tulip, Popple, Canoewood, Whitewood, Canoe tree.

Habit. --Large tree up to 60 meters high with tall straight trunk free of branches for a substantial height. Pyramidal crown on young trees; broad, spreading crown on older trees.

Bark. --Thick, deeply furrowed, brownish.

Twigs. --Smooth, lustrous, reddish-gray, abundantly conspicuous pale lenticels; large, circular, conspicuous leaf scars. Large, oblong terminal bud 1.5-2.5 cm long, dark red, flattish, smooth.

Leaves. --Deciduous, alternate simple, saddle-shaped, 9-12 cm long and nearly as wide, apex broadly truncate with a pointed lobe on each side. Slender petioles 5-10 cm long.

Flower. --May-June. Large, tulip-shaped, attractive, 6 petals that are pale green marked with orange.

Fruit. --Brown, oblong, pointed cone, 6-8 cm long, 1.0-1.5

cm wide, made up of many carpels with seeds ripening in the base of the carpels in late September.

Habitat. -- Deep woods in bottomlands, and moist ravines and hillsides.

Ethnic Remarks. -- Liriodendron comes from two Greek words, lirio meaning lily and dendron meaning tree; tulipifera refers to the tulip-shaped flowers.

The Catawba Indians ingested tulip tree root bark to get rid of worms while other tribes had their children eat the seeds of this tree to expel worms. This plant has been used in domestic practice to reduce fever and to stimulate the flow of urine. The U.S. Pharmacopoeia listed the bark of this tree from 1820 to 1882 as a tonic and diuretic.

Tulipiferine is found in the inner bark of the tulip poplar and is reported to exert powerful effects on the heart and nervous system. The powdered bark has been used for rheumatism and digestive problems according to the Dispensatory of the United States (Weiner, 1972).

An ointment can be made from the buds that will cure scalds, burns, and inflammations. The juice was employed for treating yaws. In chronic rheumatism a decoction of the bark acts as a warm sudorific. During the Civil War the bark of this tree and the willow in cold infusion was used to treat fevers. The Indians regarded the fruit and bark to be specific against agues (Vogel, 1970).

The tulip tree is an important lumber source. The wood takes glue easily, making it an ideal veneer core to lay thin sheets of walnut or mahogany on. The heartwood is somewhat resistant to decay. In Pennsylvania and Virginia it was called the canoe tree because the Woodland Indians made dugouts from its soft, easily worked wood. The tulip tree is the tallest of the eastern hardwoods reaching a height of 198 ft. and a diameter of 12 ft. Small animals eat the winged seeds (Harlow, 1957).

Moraceae--The Mulberry Family

Maclura pomifera (Raf.) Schneid.

Folknames. --Osage Orange, Hedge Apple, Bois d'Arc, Bow Wood, Hedge, Bodeck, Bodoch, Horse Apple, Mockorange, Osage Apple.

Habit. --Medium-sized thorny tree attaining a height of 20 m with a short stout trunk, curved, tangled branches and limbs and an irregular, round-topped crown.

Bark. --Dark orange-brown, rough, deeply furrowed with raised ridges that flake into thin, close scales. The root bark is bright orange and thin, peeling into strips.

Twigs. --Greenish-yellow to orange-brown, rigid, slender, thorny, containing a milky sap; terminal buds absent; lateral buds broadly egg-shaped, blunt, or pointed, 4-6 mm long, yellow-brown scales with dark margins; leaf scars half-round.

Leaves. --Deciduous, simple, alternate, egg-shaped with long pointed tip and rounded base, 4-12 cm long, 2-6 cm wide, margin entire, smooth, shiny, dark green blade. Leaves often clustered; petiole grooved on top, 1-2.5 cm long, containing a milky juice.

Flowers. --Mid-May. Dioecious. Staminate flowers in globular clusters on short spur branches, each flower small, yellow-green, hairy, having 4 stamens and large yellow anthers; pistillate flowers in dense globular clusters at the base of a leaf, the small, flat, circular green ovaries have long yellow thread-like stigmas.

Fruit. --September. The "hedge apple" is an aggregate of many small fruits, the "apple" is globular, yellow-green, lumpy, 8-12 cm in diameter, and contains a milky sap; oval cream colored seeds, 8-12 cm long are found buried in the thick, sticky flesh of the ball.

Habitat. --Grows in a wide variety of soils, but prefers fertile lowlands.

Ethnic Remarks. --Maclura is named in commemoration of William McClure, an early American geologist; pomifera means fruit bearing and refers to the large apple-like fruit (Stephens, 1969). Osage orange has been widely planted for hedge and ornamental purposes and is commonly called "hedge apple" in east central Illinois. The hedges provide a windbreak and a natural fence around fields; they also give excellent cover for game birds, song birds, and many mammals. Rabbits and squirrels tear open the fruits and eat the seeds. The strong, hard, durable wood is very resistant to decay and makes excellent fence posts. According to Stephens (1969), the American Indians prized Osage orange as an excellent wood for making bows and thus came the term

"Bois d'Arc", a name given to the tree by early French explorers. As Deuel (1959) notes it, the bow and arrow was a definite improvement over the spear. It not only gave a greater range, but also constituted a repeating weapon. Ammunition could be carried in a quiver on the back or tucked under the belt without hampering the bowman.

The bright orange wood produces a dye that is used for orange-yellows, gold and as a base for greens in coloring cloth (Hill, 1952).

A decoction prepared by boiling the roots was once used to bathe irritated eyes (Krochmal, 1973).

Nuttall stated that the bark "affords a fine white flax." To remove the fibers the bark is treated in the same manner as basswood (Harlow, 1957).

Morus rubra L.

Folknames, --Red Mulberry, Wild Mulberry, Black Mulberry, Bulberry, Murier Sauvage, Virginia Mulberry.

Habit, --Medium-sized tree attaining a height of 20 meters with a short trunk and a dense, broad, round-topped crown.

Bark, --Dark grayish-brown, thin, narrow, firm ridges sometimes plate-like and scaly.

Twigs, --Orange-brown, flexible, slender, smooth, covered with a few scattered lenticels; terminal buds absent; lateral buds ovoid, greenish-brown to greenish-red, 10 mm long, 3-9 scales; leaf scars half-round.

Leaves, --Deciduous, simple, alternate, egg-shaped, broad, short pointed tip and rounded base, 6-15 cm long, 2-10 cm wide; closely and sharply toothed margin, usually unlobed, sometimes 3-lobed or 5-lobed, somewhat hirsute above, softly pubescent below; petioles 2-3 cm long.

Flowers, --Early May. Male and female flowers on the same tree or on different trees, male catkins 2.5-5 cm long, 4-5 yellow-

green sepals with a reddish tip, 4 stamens with small yellow anthers; female catkins about 1 cm long, green, egg-shaped ovary surrounded by green, hairy scales, 2 reddish-brown stigmas.

Fruit. -- May-June. Multiple fruit of several small fruits, each with a seed, cylindric multiple fruit 1.5-2.5 cm long, puce to purple when mature, seed small, tan, with thin soft shell.

Habitat. -- Prefers rich moist soil on hillsides and flatlands.

Ethnic Remarks. -- Morus comes from the classical Latin name while rubra refers to the red color of the fruit (Stephens, 1969). The red mulberry is a useful ornamental with its rather large dark green foliage that turns bright yellow in the fall. Many species of birds and mammals eat the fruits. The strong durable wood is resistant to decay and is used as fence posts and for shipbuilding. The American Indians used the wood for making bows and as supporting posts for their wooden lodges. The fruits were used by the Indians in making a trail food called pemican which consisted of dried fruit, parched corn and hickory nut kernels mixed together.

The sweet fruits can be eaten fresh, made into jelly, or pies can be made from them.

In Europe mulberry root bark was boiled and strained to prepare a decoction to kill tapeworms. The Rappahannock Indians of Virginia applied the milky latex from the axis of the leaves to the scalp to

cure ringworm (Weiner, 1972).

The fruit has been used to make a cooling drink for fever and also to serve as a mild laxative (Krochmal, 1973).

Woodland Indians used the fibrous bark to weave cloth. The fibers were removed in the same way described for basswood (Harlow, 1957).

Oleaceae -- The Olive Family

Fraxinus americana L.

Folknames. -- White Ash, American Ash, Biltmore Ash, Cane Ash.

Habit. -- A tall tree reaching a height of 40 meters with a long straight trunk and an open round-topped crown.

Bark. -- Dark gray, furrowed, flat topped ridges, somewhat corky in texture.

Twigs. -- Gray to yellow-brown, rigid, coarse, brittle, smooth; terminal bud dark brown, rough, about 7 mm wide, wider than long; lateral buds similar but smaller; narrow U-shaped leaf scars.

Leaves. -- Deciduous, pinnately compound, opposite, 20-25 cm long with 5-9 leaflets, leaflets elliptic, with abruptly tapered tip and wedge-shaped base, 6-12 cm long, 4-6 cm wide, margin entire or toothed, blade dark green and glossy above, whitened with a few hairs on the larger veins below; petiole 4-5 cm long, leaflets with short stalks.

Flowers. -- April. Dioecious, flowers in clusters from buds of

the previous season. Staminate clusters red-brown, becoming yellow or orange as pollen matures, each flower with a short stalk, small calyx, no petals, and 2 stamens with red-brown or orange anthers. Pistillate flowers with short stalk, larger calyx than the male, no petals, a dark green, egg-shaped ovary having small wings and a reddish style and stigma.

Fruit. -- July-August. Straw colored, in pendant clusters, 3-4 cm long, a terminal wing extends a short distance along each side of the fruit body, fruit body elliptical and plump.

Habitat. -- Usually grows in upland or hillside woods as a forest tree.

Ethnic Remarks. -- Fraxinus is the ancient Latin name for the group while americana pertains to its native home. The wood is strong, durable, and straight grained and is used for skis, tennis rackets, ball bats, tool handles, garden furniture and wagons. It was once used in car and airplane construction (Stephens, 1969).

The Woodland Indians and early settlers drank a decoction of the buds or bark of white ash as a remedy for rattlesnake bites. The tree was said to repel rattlesnakes, but the validity of this notion is very doubtful (Weiner, 1972).

A Mrs. Lornis, in Connecticut, stated that an Indian cured a cancer by the internal and external use of white ash juice that dripped out of the wood as it burned.

The Meskwaki Indians employed an infusion of white ash bark on sores and to cure itching, including scalp itch. The bark of Fraxinus americana L. is bitter, tonic, and astringent, and has been used for treating fevers (Vogel, 1970).

As portrayed in Scandanavian mythology the fabric of the universe was maintained by Yggdrasil, the world tree, which was a gigantic ash that remained green always thanks to the care of the Norns. Four deer ceaselessly browsed on its leaves. The ancestors of a future race of men were to emerge from the wood of this tree after the death of the old gods (Guirand, 1972).

Platanaceae--The Plane Family

Platanus occidentalis L.

Folknames. --Sycamore, Buttonwood, American Plane, Plane Tree, Whitewood, Water Beech.

Habit. --A large tree reaching a height of 50 meters with a tall trunk and a wide-spreading round crown.

Bark. --Nearly white with thin sheets of greenish-brown bark peeling off on young trees and limbs of old trees; on old trees at the base the bark is dark brown and fissured into broad ridges covered with thin scales.

Twigs. --Brown to gray-brown, coarse, rigid, covered with numerous small pale lenticels; terminal bud absent; lateral buds conical, pale brown, 6-10 mm long, bluntly pointed; leaf scars encircling the bud.

Leaves. --Deciduous, simple, alternate, broadly ovate, 10-12 cm wide, usually heart-shaped at base, 3- to 5-lobed with shallow sinuses and broad-triangular lobes, coarsely toothed or entire margin, bright green above, pale green and white woolly beneath; petiole 4-6 cm long.

Flowers. --May. Staminate and pistillate flowers in dense heads on separate stalks. Male heads axillary, dark red; female heads 1 or 2, terminal, greenish tinged with red, hanging on a stalk.

Fruit. --October. Globular clusters 2.5-3.5 cm in diameter on a pendant, fibrous, slender stalk 8-15 cm long, remaining on tree most of the winter, each small fruit pale brown, narrow, conical with the wide end out, about 1 cm long, a tuft of brownish hairs around the base.

Habitat. --Prefers rich, moist, soils along streams and in bottomlands.

Ethnic Remarks. --Platanus is the ancient Greek name for the plane tree and means "flat" pertaining to the large leaves; occidentalis refers to the Western Hemisphere.

The wood was once used for ox yokes and for making whole round wheels for wagons and ox carts. Presently it is used for cutting blocks, woodenward, brush handles, boxes, furniture, and interior finish. In the lumber industry it is called "lacewood" due to its flaky appearance (Stephens, 1969).

Michaux wrote that the Illinois French used sycamore to make dugout canoes. One such canoe was sixty-five feet long and carried nine thousand pounds (Harlow, 1957).

The sycamore is widely planted for ornamental and shade pur-

poses. However, the hybrid London Plane is more desirable for cultivation due to its more attractive form and resistance to fungus diseases. The sycamore can be propagated from cuttings as well as from seeds (Li, 1972).

An old Indian remedy for poison ivy was prepared by boiling sycamore bark in water and then bathing the affected area with the sycamore decoction (Goodwin, 1975).

Rosaceae--The Rose Family

Crataegus mollis (T. & G.) Scheele

Folknames. --Red Haw, Hawthorn, Downy Hawthorn, Thorn-apple.

Habit. --A small tree 5-7 meters tall with a broad crown.

Bark. --Red-brown to yellow-brown, shallow furrows and blocky or flaky flat-topped ridges.

Twigs. --At first white wooly, becoming smooth and brown by the second year, rigid, coarse; buds reddish, broadly egg-shaped, 3-5 mm long, blunt end; leaf scars narrow with wide ends and center.

Leaves. --Deciduous, simple, alternate, broadly egg-shaped, short pointed tip and rounded base, 7-10 cm long, 7-8 cm wide, margin coarsely toothed and somewhat lobed and hairy; blade dull yellow-green and often wrinkled on top, paler and pubescent beneath; petiole 1.5-4 cm long.

Flowers. --April-May. Perfect. Flowers in clusters of 5-7 on the end of a densely tomentose stalk, each flower 2-2.5 cm across

with 5 green sepals, 5 white, circular petals, 20 stamens with small, light yellow anthers, ovary below the sepals, 4-5 styles having large yellow stigmas.

Fruit. --September. Erect or drooping, solitary or clustered, scarlet, globular, 1.4-1.8 cm in diameter, pubescent, tart, thick, yellow flesh; 3-5 seeds, yellow-brown, crescent-shaped, broad, ridged on one side, 7.5 mm long.

Habitat. --Grows along streams, on wooded hillsides, and in pastures and thickets.

Ethnic Remarks. --Crataegus is the ancient Greek name for the hawthorn and mollis pertains to the soft, downy hairs on the twigs and leaves (Stephens, 1969).

Hawthorn fruits were a source of food for early Indians in the lower Illinois River Valley (Zawacki and Hausfater, 1969). The palatable fruits are juicy at first and later become mellow. They can be made into jelly or preserves and have sufficient natural pectin to jell without adding the commercial variety.

Tobe (1973) indicates that dried hawthorn fruits have cardiac and tonic properties and are claimed to be a curative for heart disorders such as dyspnoea, rapid and feeble heart action, hypertrophy, valvular insufficiency and heart oppression.

Hawthorn fruits have been found effective in treating arterio-

sclerosis. The dosage is from three to fifteen grains of the powdered fruit taken three times a day. A tincture can be prepared by mixing one ounce of the powdered fruit into one pint of grain alcohol. Depending on the urgency of the condition, from one to fifteen drops of the tincture may be taken at a time. This hawthorn preparation is mild and non-toxic. It may require several days of treatment before good results are obtained. Taking a large dose may cause dizziness (Kadans, 1970).

The thorns were gathered by Chippewa women for use as sewing awls (Densmore, 1974). Fishhooks can also be improvised from the strong, sharp thorns (Hall, 1973).

Malus ioensis (Wood) Britt

Folknames. -- Wild Crabapple, American Crab, Sweet Scented Crab, Fragrant Crab, Garland Tree.

Habit. -- Small scrubby tree with a dense, rounded, crown reaching a height of 7 meters; often having several thorny shoots coming up around the main trunk.

Bark. -- Red-brown to gray-brown, splitting into thin short flakes.

Twigs. -- Red-brown, rigid, coarse, smooth or pubescent, some branches ending in thorns; terminal buds red-brown, conical, about 4 mm long, hairy; lateral buds smaller; crescent-shaped leaf scars.

Leaves. -- Deciduous. Simple, alternate, elliptic, blunt tip, broadly rounded or tapered base, 6-9 cm long, 3-6 cm wide, margin coarsely toothed or lobed, dark yellow-green blade, paler and wooly on undersurface; wooly petiole 1-2.5 cm long.

Flowers. -- May. Perfect. In clusters from buds of the preceding year, each flower 2.5-3.5 cm across with 5 green sepals, 5

pink petals, numerous small stamens with yellow anthers, inferior ovary, 5 long styles with green club-shaped stigmas.

Fruit. --September-October. Yellow-green, globular on a hairy stalk 2-2.5 cm long; apples 2.5-4 cm in diameter with small white dots, acrid taste; seeds egg-shaped, chocolate-brown, about 7 mm long.

Habitat. --Wild crabapple will grow in a wide range of soil types in the open or beneath larger trees in a woods or fencerow.

Ethnic Remarks. --Malus is the ancient Latin name for the apple and ioensis pertains to the state of Iowa.

Wild crab apples are usually too tart to be eaten in the raw state. The Indians harvested them in the fall and stored them under the ground in bark containers. By springtime the fruits were sweet and were used to make jelly, syrup, or cider (Weiner, 1972).

Wild crab apples persist through winter and provided a vitamin C rich food source for early Indians in the Lower Illinois River Valley (Zawacki and Hausfater, 1969).

Prunus americana Marsh

Folknames. -- Wild Plum.

Habit. -- Bushy shrub or small tree reaching a height of 5 meters often forming dense thickets.

Bark. -- Dark gray-brown to reddish-brown, prominent horizontal lenticels, older trees with thin, large, scaly plates.

Twigs. -- Orange-brown or purplish, rigid, slender, smooth, often spine-tipped, buds dark brown, egg-shaped, pointed, leaf scars half round with a row of hairs on the upper edge.

Leaves. -- Deciduous, simple, alternate, oval with tapered tip and rounded base, 6-10 cm long, 3-5 cm wide, sharp marginal teeth pointed forward, blade dark green, often somewhat wrinkled above, paler and hairy beneath; slender petiole, 9-16 mm long, hairy only on upper surface.

Flowers. -- April. Perfect. In clusters on the end of a short spur or from buds along the stem; each flower 2 cm across with 5 sepals, 5 white petals, 20-30 stamens and small yellow anthers, green egg-shaped ovary, with a long slender style and brown stigma.

Fruit. --August. On a stalk 8-15 mm long, red or orange with whitish film, globular, 2.2-2.7 cm long, with thick, sweet, juicy flesh; stone cream colored, oval, 1.6-1.8 cm long, flat, smooth surface, a coarse ridge on one edge.

Habitat. --Will grow in a wide variety of soil types, in fence rows, near streams, and on bushy hillsides.

Ethnic Remarks. --Prunus is the classical Latin name for the plum, while americana pertains to its native home (Stephens, 1969).

The fruits are succulent when ripe, and they can be used in making preserves. According to Deuel (1958), the Illinois tribes utilized wild plums as a part of their diet. It is known that wild plums were used fresh, cooked, or dried as a food source by the early Indians of the lower Illinois River Valley (Zawacki Hausfater, 1969).

Plum-tree leaves can be boiled in wine to prepare a gargle and mouthwash that is useful in treating sores in the mouth. A solution can be prepared by boiling the leaves or the gum in vinegar which, when applied, cures ringworm and tetter (Culpeper and Simmonite, 1957). The Meskwakis scraped and boiled the inner bark and gargled with the resulting solution to treat sores in the mouth and throat (Weiner, 1972).

Prunus serotima Ehrh.

Folknames. -- Black Cherry, Black Choke, Cabinet Cherry, Cherry, Choke Cherry, Mountain Black Cherry, Rum Cherry, Virginia Prune Bark, Whiskey Cherry, Wild Black Cherry, Wild Cherry.

Habit. -- Tree up to 30 meters high with an irregular oblong crown.

Twigs. -- Reddish-brown, slender, smooth, numerous pale rounded lenticels; small, brown, bluntly pointed, egg-shaped buds; leaf scars elliptic, raised.

Leaves. -- Deciduous, alternate, simple, narrowly elliptic with a tapered tip and base, 4-10 cm long, 2-4 cm wide, finely toothed margin with incurved teeth, dark green blade, glabrous; petiole slender, 1-1.5 cm long, reddish, 2 glands near the blade.

Flowers. -- April-May. Perfect. In loose spike-like clusters, 5-10 cm long on the end of a new stem. Each flower about 7 mm across, 5 green sepals with pale margins, 5 rounded, white petals, 15-20 stamens with small yellow anthers, dark green ovary with a short green style and large, thick, lobed stigma.

Fruit. --August. A dark red globular drupe 8-10 mm across, turning purple-black and arranged in open drooping racemes that are 7-10 cm long.

Habitat. --Prefers moist rich soil, but grows well on gravelly, dry or sandy slopes; often found in upland woods.

Ethnic Remarks. --Prunus comes from the ancient Roman for the plum and serotina means "late ripening" pertaining to the extended period of fruit ripening (Stephens, 1969).

The bark tea is used to treat coughs, colds, and measles in Appalachia. The warm tea was used to relieve pains and muscle soreness and was given to women in childbirth. An infusion of the dried and pulverized berries can be used in treating diarrhea. The pioneers used the bark to treat tuberculosis, intestinal worms, fever, and indigestion. It is considered to be an effective expectorant (Krochmal, 1973).

The wood is similar in appearance to mahogany, takes a fine finish and is used for show cases, cabinets, furniture, wall panels, interior finish, and musical and scientific instruments. Many birds including the brown thrasher, robin, mockingbird, blue jay, and waxwing, eat the fruits, and small mammals chew the stones open for the kernel. The leaves contain hydrocyanic acid and are poisonous to cattle, however deer browse on them with no harm.

The Meskwaki tribe made a sedative tea by steeping the root bark. The tea has been popular for a long time in domestic American medicine. Cherokee women were given tea made from the inner bark to relieve pain in the early stages of labor. Black cherry became official in the U.S. Pharmacopoeia in 1820 where the bark is still listed for its sedative properties. All parts of the plant yield hydrocyanic acid when steeped in water, however the medicinal properties are destroyed by boiling. For medicinal use the bark is collected in autumn when it has the strongest concentration of hydrocyanic acid. The bark deteriorates with time and should not be stored for more than a year.

Black cherries were utilized as food by many Indian tribes. They were eaten fresh or dried for future use. The cherries were sometimes ground in a mortar and pestle and mixed with dried powdered meat and added to soups (Weiner, 1972).

Culbreth (1927) indicates that wild cherry bark contains amygdalin, emulsin, bitter principle, tannin, resin, gallic acid and benzoic acid. Its properties are sedative, pectoral, aromatic bitter tonic, astringent, increases appetite, stimulates digestion, and large doses decrease heart action. It is used in treating consumption, bronchitis, cough, scrofula, stomach atony, heart palpitation, dyspepsia, hectic fever, debility and as a cold infusion for ophthalmia.

The gummy exudation of the trunk has healing properties when applied directly to cuts and sores (Harris, 1972).

Rosa carolina L.

Folknames. --Pasture Rose, Wild Rose, Prairie Rose.

Habit. --A small erect shrub with simple stems reaching a height of 70 cm.

Bark. --Green or redish-brown, main stem densely covered with prickles.

Twigs. --Red, green, or reddish-brown; slender, usually covered with straight infrastipular prickles; buds red, egg-shaped, bluntly pointed, 1.5 mm long; narrow leaf scars halfway around the stem.

Leaves. --Deciduous, pinnately compound, alternate, 8-10 cm long with 5-9 leaflets, leaflets oval with rounded tip and tapered base, margin sharply toothed except at base, blade dark green above, paler and pubescent below; hairy petiole 1.5-2 cm long.

Flowers. --June. Perfect, single or in clusters of 2-4 at the tip of the season's growth, flower stalk 10-14 mm long, each flower 5-7 cm across with 5 long-pointed, narrow hairy sepals, 5 pink heart-shaped petals, numerous stamens with yellow filaments and yellow

anthers, several pubescent green ovaries attached to the bottom and inside walls of the hypanthium, hairy, club-shaped styles that form a flat dome in the center of the flower.

Fruit. --August. Bright red, globular, solitary or clustered. 10-15 mm in diameter, smooth, sepals attached; seeds yellow or brown, egg-shaped, hairy, 4-5.5 mm long.

Habitat. --Prefers rich soil along roadsides, in open prairies or in open woods.

Ethnic Remarks. --Rosa is the old Roman name for the group, while carolina refers to the states of that name.

The North American Indians avoided suffering from scurvy, probably because they ate so many berries rich in vitamin C throughout the year. Wild rose fruits were eaten from Main to British Columbia. It has been demonstrated that rose hips contain large amounts of vitamin C. Three rose hips are said to have as much vitamin C as one orange. The English people were encouraged to gather rose hips during World War II. The fruits were pulverized and distributed by the Ministry of Health throughout the country for their precious vitamin content.

The Indians usually ate rose hips raw in times of scarcity. They are easily recognized, are available throughout the year, and are rich in calcium, phosphorus, and iron as well. The Mescalero

Apaches drank wild rosebud tea to cure gonorrhoea (Weiner, 1972).

The rose has long been a symbol of love, beauty, and grace and was connected with "Golden Aphrodite, lover of laughter, born of the sea foam," the Greek goddess of love and beauty. Homer referred to "the beauty of her neck and her lovely breasts and sparkling eyes." One aspect of Aphrodite's nature was that of being the goddess of gardens (Cavendish, 1970).

Rubus flagellaris Willd.

Folknames. -- Dewberry, Northern Dewberry, Lowbush Blackberry, Brambleberry, Goutberry.

Habit. -- Long trailing stems that may climb fences or other plants to a height of one meter or may creep along the ground half-hidden in tall grass.

Bark. -- Green or brownish-red, smooth with prickles, thin.

Twigs. -- Green or red, slender, flexible, often ridged, many curved prickles; buds brown, 3-5 mm long, pubescent; broad crescent-shaped leaf scars.

Leaves. -- Deciduous, compound with 3-5 leaflets, alternate; leaflets egg-shaped, with pointed tip and rounded base, 6-8 cm long, 4.5-6 cm wide, margin serrate, blade dark green top side, paler and pubescent below; petiole 4-6 cm long with prickles on the bottom surface.

Flowers. -- May. Perfect, solitary or in round-topped clusters, each flower approximately 3 cm across having 5 green, wooly, long pointed sepals, 5 or more white, rounded petals, many stamens with small, yellow anthers, an elongated center and several pistils having

small green, oval ovaries and 2-3 lobed stigmas.

Fruit. -- June. Glossy, black and sweet when ripe, red when immature, cylindrical, 1.2-2.2 cm long, made up of numerous small fruits; seeds yellow, irregular in shape, rough, 2.9-3.2 mm long.

Habitat. -- Grows on almost any kind of soil, however it prefers poor or acid soils, often found along roadsides, fencerows, hillside pastures, thickets, and cut-over woods.

Ethnic Remarks. -- Rubus is the ancient Latin name for the plant, while flagellaris pertains to the long, whip-like stems. The juicy sweet fruits can be eaten raw directly from the vine or made into pies, jam, sauce, or syrup. It furnishes excellent food and cover for songbirds, gamebirds, and mammals and is a good plant for protection of the soil. Even the red fox savours a tasty meal of dewberries (Stephens, 1969).

A tea made from the roots can be used to dry up runny noses and to stop dysentery (Krochmal, 1973).

The ripe fruits contain citric and malic acids both of which counteract and dissolve deposits of tartar in the mouth. A decoction can be made from the unripe fruits and the fall-collected roots that is useful as a gargle for thrush and other throat irritations (Harris, 1972).

Rubus occidentalis L.

Folknames. -- Black Raspberry, American Raspberry.

Habit. -- A shrub with canelike stems 2-4 meters long that arch and recurve so that the tips often root in the soil.

Bark. -- Purplish-red, often with a white bloom that easily rubs off, smooth with broad based, curved prickles.

Twigs. -- Light green at first, later becoming light reddish-purple, coarse, smooth with broad-based and curved prickles; buds red-brown, narrow, 3-5 mm long, pointed, pubescent; leaf scars indistinct.

Leaves. -- Deciduous, compound with 3-5 leaflets, alternate, leaflets oval to egg-shaped with a tapered tip and a rounded base, 6-8 cm long, 4-6 cm wide, margin coarsely doubled serrate, blade dark green above, white and wooly underneath; petiole 5-6 cm long, often with prickles.

Flowers. -- May. Perfect, in clusters on stalks 5-8 cm long, each flower having 5 hairy sepals longer than the petals and tapered to a point, 5 white petals 4-4.5 mm long, numerous erect stamens with

small, yellow anthers, many pistils around a dome-shaped base, green ovaries, 2-3 lobed stigmas.

Fruit. -- June-July. Purple-black and sweet when ripe, red when immature, fruits clustered on a stalk 1.5-2 cm long with curved prickles on the sides, each dome shaped aggregate fruit composed of many small fruits and 12.5-14 mm across; seeds yellow, tiny, irregular in shape, rough, about 2.4 mm long.

Habitat. -- Occurs in both moist and dry environments in open woods and clearings, in fencerows and on the borders of streams and lakes.

Ethnic Remarks. -- Rubus is the ancient Roman name for the plant, while occidentalis refers to the Western Hemisphere. The berries are excellent when eaten directly from the plant, as a table dessert, or in jam, pies, or syrup for ice cream. The vines afford good wildlife cover and the fruits are eaten by songbirds, gamebirds, and mammals (Stephens, 1969).

The Omaha, Dakota, and Pawnee tribes used a decoction of black raspberry root bark for dysentery (Weiner, 1972).

The leaves and fruit of black raspberry have astringent properties when used as an infusion made by adding one ounce of the leaves and/or berries to boiling water. The solution is used as a gargle in sore throats, cankers of the mouth, and as a wash for wounds and

ulcers. Raspberry leaf tea is recommended for pregnant females to give them strength and to render parturition easy and speedy. The tea is also very useful for the stomach trouble of children (Wren, 1968).

Rubus ostryifolius Rydb.

Folknames. --Highbush Blackberry, Tall Blackberry, Blackberry, Wild Blackberry.

Habit. --Stout, erect or arching primocanes reaching a height of about 2 meters and forming dense thickets.

Bark. --Red-brown, smooth, somewhat ridged, with curved, broad-based brown prickles.

Twigs. --Red-brown to green with blotches of brown; buds red, conical, narrow, hairy, pointed, indistinct leaf scars.

Leaves. --Deciduous, compound with 3-5 leaflets, alternate, leaflets oval, with broadly tapered base and tapered tip, 6-10 cm long, 3.5-5 cm wide, coarsely toothed margin, blade dark green above, paler and pubescent below, some prickles on the veins; petiole 3-6 cm long with curved prickles on the bottom side.

Flowers. --May-June. Perfect, in elongated, loose clusters on the tip of a short stem, each flower having 5 green sepals, 5 white, egg-shaped petals, numerous stamens with small yellow anthers, an elongated, cylindrical center and many pistils with small, green, egg-

shaped ovaries and greenish-yellow, club-shaped style and stigma.

Fruit. -- July. Glossy black when ripe, red when immature, cylindrical, 1.5-2.5 cm long, made up of many small fruits; seeds yellow, egg-shaped, flattened, 2.6-3 mm long, rough.

Habitat. -- Will grow in a wide range of soil types, often found on hillsides in pastures, in fencerows, and in thickets and cut-over woods.

Ethnic Remarks. -- Rubus is the ancient Roman name for blackberries, while ostryifolius pertains to the likeness of the leaflet to the leaf of the Ironwood, Ostrya. The berries are tasty, sweet and juicy when picked and eaten directly from the plant and are also used in pies, jelly, sauces, and syrup. The dense thickets formed by blackberry canes are excellent hiding and nesting sites for birds and small mammals as well as an excellent source of food when the berries are ripe (Stephens, 1969).

The bark of the root can be tinctured or boiled for tea. It is binding and toxic and is used for treating diarrhea. A fluid extract is given in doses of half a teaspoonful three or four times a day. Blackberry syrup and blackberry brandy can also be used in a dose of a tablespoonful three or four times daily. Blackberry root tea is effective as a douche in leucorrhea, gleet and falling of the womb (Scholl, 1949).

Five hundred Oneida Indians used this plant to cure themselves

of dysentery while the nearby white settlers died of the disease. The dried root bark was listed in the U.S. Pharmacopoeia from 1820 to 1916 (Weiner, 1972).

A. C. Parker, the anthropologist of Iroquois origin, relates the fun of berry picking among his people:

The gathering of the autumn berries was regarded more of a pastime than work. In fact, work with these people in many lines was made easier by its social character, and seemed more like a game where the thrill of it all kept the thought of fatigue away . . . The women and girls . . . would go in groups to the places where patches of the vines and bushes grew and sing their folksongs as they gathered the fruit. Everyone laughed or sang and picked as fast as their two hands could touch the berries (Weiner, 1972).

Rutaceae--The Rue Family

Ptelea trifoliata L.

Folknames. --Hop tree, Wafer Ash, Wing Seed, Shrubby Trefoil, Swamp Dogwood.

Habit. --A tall shrub reaching a height of about 2 meters, often with several trunks from one base.

Bark. --Reddish-brown, smooth with conspicuous horizontal lenticels, older trees having bark that is somewhat split.

Twigs. --Dark brown, pubescent at first, later shiny, brittle, slender; globular, small, wooly, white, buds, partially hidden by the shield-shaped leaf scars.

Leaves. --Deciduous, compound, alternate, 10-15 cm long, the 3 leaflets without stalks; leaflets egg-shaped, elliptical, with a pointed tip and a tapered or rounded base, 6-9 cm long, 3-5 cm wide, center leaflet largest, margin entire or finely toothed, the teeth sparse, blade dark yellow-green and shiny above, pale with some hairs below; petiole 6-8 cm long.

Flowers. -- May. Dioecious, staminate flowers in round-topped clusters of many flowers on the end of new growth, 4 yellow sepals, 4 yellow petals that are finely pubescent and somewhat folded lengthwise, 4 stamens with tapered filaments that are wooly at the base, large golden-yellow anthers; pistillate flowers in round-topped clusters of few flowers on the end of a new branch, sepals and petals like those of the male, a small stalked, winged ovary, a short, hairy style with a 2-lobed stigma.

Fruit. -- June. Straw-colored, in drooping clusters, circular, winged, 1.7-2 cm across, the shiny tan seed in the center of the flat wing.

Habitat. -- Grows in open pastures, fence rows, along roadsides, and along the borders of woods, it does not form thickets.

Ethnic Remarks. -- Ptelea is the ancient Greek name for the elm and is used due to the similarity of the two fruits; trifoliata refers to the three leaflets.

The bark of the roots can be used as a substitute for quinine, and the fruits can be used in place of hops in beverages (Stephens, 1969).

The hop tree was used by the Menominees as a sacred medicine. It was mixed into other medicines to give them increased potency. Rafinesque included the plant in his work Medical Botany in 1830. He noted it as being useful for killing intestinal worms and for treating

wounds (Weiner, 1972).

Meyer (1970) states that the bark of the root yields ptelein, its active principle, by boiling or with alcohol as a solvent. The solution is nonirritating and especially tonic and is a very useful promoter of appetite. It can be tolerated by the stomach when other tonics cause a disturbance. A teaspoonful of the finely cut root bark is added to a cup of boiling water and should be taken cold during the day, a large mouthful at a time.

Culbreth (1927) indicates that the root bark contains berberine which is a bitter tonic, tannin, gallic acid, and resin. It is an aromatic, tonic, stimulant, and antiperiodic and is used to treat dyspepsia, low fevers and gastro-intestinal irritation and typhoid conditions. The medicine is usually administered as an infusion or a fluidextract.

Salicaceae--The Willow Family

Populus deltoides Marsh.

Folknames. -- Cottonwood, Poplar, Whitewood.

Habit. -- A large tree attaining a height of 40 meters with erect, spreading branches, forming a high broad crown.

Bark. -- Yellow-green and smooth on young trees, ash gray, deeply furrowed with wide flat-topped ridges on older trees.

Twigs. -- Yellow-brown, brittle, coarse; buds smooth, large, shiny, numerous scales, viscid with cinnamon odor when crushed, terminal buds often 5-angled and larger than lateral buds.

Leaves. -- Deciduous, simple, alternate, thick, triangular ovate to broadly ovate, 7-12 cm long and nearly as wide, sharply pointed, coarsely toothed, 2 or 3 glands at base of blade, shiny deep green above, bright green below; petioles flattened, 5-7 cm long.

Flowers. -- April. Dioecious. Male catkin 8-12 cm long, drooping, numerous red flowers, several stamens with red anthers. Female catkin 8-12 cm long, drooping, numerous green flowers, each having an egg-shaped ovary with 3-4 large yellow-green stigmas.

Fruit. -- May. Drooping catkins, 12-23 cm long, capsules green at first, becoming brown, pointed, egg-shaped, split into 2 parts when mature, brown seeds 4 mm long with a tuft of dense, cottony hairs at the base.

Habitat. -- Prefers rich moist soil in bottomlands and along streams and lakes but also does well in drier conditions.

Ethnic Remarks. -- Populus is the old Latin name while deltoides refers to the triangular shape of the leaf. Cottonwood is a valuable pulpwood tree and is an especially useful ornamental in wet conditions. It is a fast-growing, massive tree but the wood is rather brittle and decays easily so it is mostly used for making boxes and crates (Stephens, 1969).

The root bark of cottonwood can be boiled in water and mashed into a poultice for soothing inflamed tissues (Jaeger, 1966).

Tea made from the buds, bark, or leaves of cottonwood is useful in treating rheumatism, chronic diarrhea, intermittent fever, hay fever, and influenza; externally the decoction can be used to treat eczema and sciatica (Kloss, 1973).

The leaves and bark can be boiled in water and the vapors inhaled to treat snakebite. Indians poured a decoction made from the bark over a broken limb before applying a splint. The bark tincture has been used for treating pulmonary ailments, gout, scurvy, and stomach and kidney disorders (Krochmal, 1973).

An old legend says that an Indian discovered the design for his tepee by twisting a cottonwood leaf between his fingers, producing the conical form. Indian children made play tepees in this manner (Harlow, 1957).

Salix discolor Muhl.

Folknames. -- Pussy Willow, Swamp Willow, Willow.

Habit. -- A shrub or small tree reaching a height of 5-8 meters with a short trunk and stout ascending branches forming a round-topped crown.

Bark. -- Gray or reddish-brown, smooth, sometimes scaly on older trees, thin.

Twigs. -- Dark green to reddish-purple, stout, pubescent at first, later becoming smooth, flexible; buds cylindrical, flattened, pointed at apex, 8-10 mm long, shiny reddish-purple; three crescent-shaped leaf scars.

Leaves. -- Deciduous, simple, alternate, thin, elliptic; oblong to oblong-lanceolate, sharply pointed apex, somewhat rounded base, 4-10 cm long, margin usually coarsely toothed or occasionally almost entire, green above, white bloomy beneath; petiole 8-25 mm long.

Flowers. -- March. Male catkins densely flowered 3.5 cm long; female catkins 2.5-7.0 cm long, distinct short, style with narrow bifid stigmas, pubescent ovary longer than the smooth stalk.

Fruit. -- June. Capsule 7-12 mm long, in the shape of a cylindrical brown beak with minute pale hairs.

Habitat. -- Prefers moist areas, along streams and in swamps and marshes.

Ethnic Remarks. -- Salix is the ancient Latin name for the willows, while discolor is unclear in its reference (Stephens, 1969).

The tree is a pleasing ornamental with a handsome form and attractive bark. It is especially prized for its visually and haptically appealing flowers that appear in early spring before the leaves have unfolded. The tree can be planted in rather dry situations even though it prefers a moist natural environment (Li, 1972).

American Woodland Indians believed that the catkins had aphrodisiac properties (Krochmal, 1973).

The Chickasaws used an infusion of willow roots to treat headache, nosebleeds, and dysentery while a decoction of the young branches and leaves was applied to an itchy scalp to remove dandruff (Weiner, 1972).

Culbreth (1927) indicates that willow contains salicin and tannin. In medicine salicin is administered in small doses and frequent doses in powder form, as a pill, syrup, or with glycyrrhiza extract. It is an antiperiodic, a tonic, antiseptic, antipyretic, antiferment, and non-toxic. It is weaker, slower and not as depressing to the heart as

salicylic acid. In the bloodstream it circulates as sodium salicylate, is converted into glucose and saligenin in the stomach and is eliminated in the urine as saligenin, salicylic, salicyluric, and salicylous acids. While all the willows contain salicin, white willow, Salix alba L., is said to contain a very high concentration of it. White willow is found along streams in East Central Illinois. Salicin is taken internally for fevers, acute rheumatism, pain relief, coryza, arterial swellings, hay fever, influenza, neuralgia, and diabetes. Externally it is applied to eczema, gangrenous wounds, cancer, and burns.

A decoction of willow bark was once used in treating consumption (Culpeper and Simmonite, 1957).

Salix nigra Marsh.

Folknames. -- Black Willow, Catkin's Willow.

Habit. -- Tree reaching a height of 25 m, often with a crooked trunk, drooping branches, and a broad, open, round-topped crown.

Bark. -- Dark gray-brown, rough, thick, deeply furrowed with broad, flat shaggy ridges.

Twigs. -- Yellowish to light red-brown, slender, flexible; buds small, narrow-conical, pointed, 2-3 mm long, covered by one scale, reddish; leaf scars narrow, crescent-shaped, with 3 bundle scars.

Leaves. -- Deciduous, simple, alternate, narrow, lance-shaped with a rounded base and sharply tapered tip, 5-13 cm long, 8-12 mm wide, margin finely toothed, blade yellow-green; slender petiole, 6-10 mm long.

Flowers. -- March-April. Dioecious. Catkins 4-6 cm long made up of many small yellow-green flowers without petals on the end of a leafy shoot, male flower with 4-6 stamens and yellow anthers, ovary of female flower with tapered outer end and 2 stigma lobes.

Fruit. -- June. Many small fruits on drooping catkins, capsules ovoid-conical, 2-3 mm long, reddish-brown, smooth, many minute seeds, covered with a dense tuft of long, white, silky hairs.

Habitat. -- Prefers moist environmental conditions, low ground, streambanks, shores, swamps.

Ethnic Remarks. -- Salix is the classical Latin name for the tree, while nigra refers to the dark gray-brown bark.

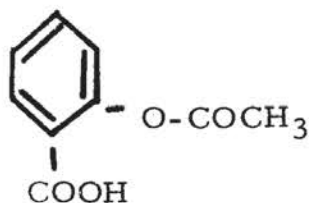
The wood is light, easy to work, and does not splinter easily, making it ideal for toys, crates, fur stretchers, and barn floors. Due to its light weight and resistance to splintering black willow is used for making polo balls (Hosie, 1973). The flexible, slender branches can be used for wicker baskets. The silky hairs of the fruits are used by some birds to line their nests (Stephens, 1969).

The bark is an astringent, antiseptic, tonic, and an antiperiodic while the buds have antiaphrodisiac properties. A tincture made from the branchlets exerts a good influence on the sex organs, as in cases of incontinence, excessive sexual desire, and acute gonorrhoea. When combined with scullcap or palmetto berries, black willow tincture is good for preventing nocturnal emissions (Kloss, 1939).

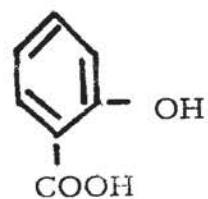
Many of the willows have been used for their fever-reducing and pain-relieving properties since the time of the ancient Greek physician Dioscorides (circa A. D. 60) who investigated and described six

hundred species of plants for their medicinal properties. In the later part of the eighteenth century the bark of willow enjoyed tremendous popularity in America. Salicin is found in the fresh bark and probably decomposes into salicylic acid in the human body. Aspirin, the well-known analgesic and febrifuge is chemically similar to salicylic acid. Their structural formulas are diagrammed below.

Aspirin
(Acetylsalicylic acid)



Salicylic Acid
(from willow bark)



Willow was used throughout its range in the United States by the American Indians. The Pomo tribe of California used the inner root bark of western willow to make a strong tea that promoted sweating in cases of chills and fever. The Natchez Indians of the south used the bark of red willow to prepare their fever remedies while the Creek and Alabama tribes plunged into willow root steam baths for the same purpose. The willow was also used by the Mohegans of Connecticut, the Houma of Mississippi, the Pima of Arizona, the Penobscots of Maine, and Montagnais of southeastern Canada, and several other American tribes. The glucoside salicin from various species of willow was listed in the U.S. Pharmacopoeia from 1882 through 1926 (Weiner, 1972).

The black willow has been referred to as the "woman's remedy" for it is valuable in treating inflamed and ulcerated surfaces of the mucous membrane of the vagina. One ounce of the powdered bark is mixed with a pint of boiling water for use as a douche. The same solution can be taken for ovarian pain, the dosage is one ounce twice a day (Kadans, 1970).

From personal communication with Yuko Miyazoe, a graduate student in English from Saga, Japan, I learned that the Chinese thought it to be very beautiful when a woman's eyebrows were shaped like a willow leaf.

Staphyleaceae--The Bladdernut Family

Staphylea trifolia L.

Folknames. --Bladdernut, American Bladdernut.

Habit. --An erect solitary or clustered shrub 3-12 feet high, with stems up to 4 inches in diameter.

Bark. --Grayish-brown, smooth on young stems, scaly on old trunks.

Twigs. --Greenish-brown or reddish-brown, flexible medium coarse, often having small slits showing the tan inner bark; buds reddish-brown, large, egg-shaped; half-round leaf scars.

Leaves. --Deciduous. Trifoliate, opposite, leaflets oval or wider toward the outer end, tapered tip and bluntly tapered base, 6-8 cm long, 3-4.5 cm wide, finely toothed margin, blade dark green above, pale with white hairs below; petiole 6-10 cm long.

Flowers. --Late April. Perfect. Flowers in drooping clusters, each cylindric flower has 5 pale green sepals, 5 narrow white petals, 5 stamens and small yellow anthers; the 3-lobed ovary with 3 styles is usually grown together and has flat stigmas.

Fruit. --August, remaining on the shrub until late winter. In drooping clusters of greenish or yellow-brown, bladder-like capsules 3-5 cm long, thin walled, 3-sectioned with pointed tips; the gray to brown oval seeds are about 6 mm long, smooth, and glossy.

Habitat. --In woods along streams or on rocky wooded hillsides.

Ethnic Remarks. --Staphylea comes from the ancient Greek word meaning "cluster of grapes" pertaining to the flower clusters; trifolia concerns the three leaflets (Stephens, 1969).

The Indians of the lower Illinois River Valley ate the oily seeds (Zawacki and Hausfater, 1969). The European species are said to have seeds that are similar in quality to pistachios. This comparison has been transferred to Staphylea trifolia (Fernald et al., 1958). When I tried eating American Bladdernut seeds I was surprised at their similarity in taste to pistachios. They are rather small and it would take quite a few of them to constitute a substantial meal. The fruits remain on the shrub until late winter and this characteristic leads one to believe that the seeds were mostly utilized as a survival food in times of short food supply.

The roots, leaves, and fruits have been used for stopping internal bleeding, and the fruit has been used for treating bladder ailments. The leaves have astringent, purgative, and emetic properties.

Tiliaceae--The Linden Family

Tilia americana L.

Folknames. --Basswood, American Basswood, Bass, Lin, Lime, Lime Tree, Whitewood, American Linden, Linden.

Habit. --Large tree to 40 meters, long straight trunk with a dense round-topped crown.

Bark. --Dark gray, thick, longitudinally furrowed, with flat scaly ridges.

Twigs. --Smooth, reddish-gray, scattered dark oblong lenticels; large, broadly triangular conspicuous leaf scars. Deep red or greenish stout ovoid buds.

Leaves. --Deciduous. Alternate, simple, inequilaterally heart-shaped, coarsely toothed, 10-20 cm long, pointed apex; petioles slender, 3-5 cm long.

Flowers. --June-July. Perfect, regular, sweetly fragrant, yellowish-white, 1.5 cm across, in 6-20 flowered cymose clusters.

Fruit. --Woody, ellipsoid, nut-like drupe about 10 mm long,

pointed at apex, brownish wool covering, in small clusters with a common stalk.

Habitat. -- Deep woods, in bottomlands and moist ravines and at the base of hills.

Ethnic Remarks. -- Tilia is a classical Latin name and americana refers to its native area of growth.

Basswood-fiber matting was used to strain maple syrup and various juices and decoctions by the Woodland Indians. Basswood-bark strips were used to tie poles together in lodges and drying racks (Ritzenthaler, 1970).

To prepare basswood fiber, the bark was cut from the tree in long strips and placed in the water at the edge of a stream or lake for a few days. After softening in water the inner bark could be separated from the coarse outer bark. The fiber from the inner bark was separated into strips less than an inch in width and stored in large coils until needed. The fiber could be twisted into twine at any time (Densmore, 1974). The Indians claimed that basswood rope was superior to that of the white man since it did not kink when dry and it was softer on the hands when wet. A section of rope any length can be made by twisting two strands separately and laying them against each other. It is important for one strand to always be kept longer than the other. The new strand is twisted in at the short end each time.

The fresh bark was also used by the American Woodland Indians as an emergency bandage for wounds. Basswood trees are called lindens in Europe, and the bark has been used there for the same purposes (Harlow, 1957).

The soft white wood of the basswood is highly regarded by artists for making woodcuts. The flowers of this tree are very fragrant and contain so much nectar that the basswood is a valuable source of honey. With its delicate flavor and light color basswood honey is one of the finest of table honeys. When the basswood is in flower, the legions of bees attracted to the flowers sets the whole treetop into a noisy hum.

Basswood tea can be made by adding one tablespoon of the flowers to a cup of boiling water. It is sweet and fragrant with a pleasant flavor, and is said to aid digestion, quiet coughs, relieve hoarseness due to colds and promote perspiration to help cool fevers (Gibbons, 1971).

Sap from basswood trees can be collected and boiled down into a syrup in the same way that maple syrup is prepared (Zawacki and Hausfater, 1969).

Ulmaceae -- The Elm Family

Ulmus rubra Muhl.

Folknames. -- Red Elm, Slippery Elm, Sweet Elm, American Elm, British Tea.

Habit. -- Medium sized tree reaching a height of 30 meters, with stout ascending limbs forming a broad flattopped crown.

Bark. -- Grayish-brown to reddish-brown, thick, long, flat, somewhat loose ridges with shallow furrows, inner bark gummy when chewed.

Twigs. -- Grayish-brown, flexible, slender, hairy, covered with raised lenticels; buds large, 6 mm long, ovoid, dark chestnut-brown with 12 scales; leaf scars oval, raised.

Leaves. -- Deciduous. Simple, alternate, 10-20 cm long, oval with pointed tip, base rounded on one side and tapered on the other, coarsely double-toothed margin, blade with dark yellow-green, hirsute upper surface and a paler hairy under side; stout petiole 2-6 mm long.

Flowers. -- March. Perfect. Short stalked, in clusters from winter buds, each flower funnel-shaped, green with brown hairs, 2.6-4 mm long with 5-8 stamens and dark red anthers; green, egg-shaped, flattened, hairy ovary with two rough reddish stigmas.

Fruit. -- April-May. Short stalked samaras, broadly elliptic to circular, 1-2 cm long, notched at apex, found hanging in clusters.

Habitat. -- Prefers moist rich situations, in bottomlands, on hillsides, along streams and in uplands where the moisture is sufficient.

Ethnic Remarks. -- Ulmus is the old Latin name for elm and rubra pertains to the red, wooly buds and the red heartwood. The red elm is a useful ornamental and shade tree with its broad open crown and large leaves that turn yellow in the fall (Stephens, 1969). It is quite tolerable of wet conditions. In the past red elms were widely planted in cities and around homes, however when the Dutch elm disease came to this country many of these stately trees were killed. Illinois mushroom hunters know that one of the best places to find morels is near the base of a dead red elm tree. The strong durable wood was used for agricultural implements, window sills, railway ties, ox yokes and wagon wheels. The inner bark can be chewed like gum and tea made from the inner bark is a remedy for sore throats.

The Woodland Indians used bark of red elm to cover their lodges (Ritzenthaler, 1970).

The inner bark of the slippery elm has been used as an emergency food. It can be eaten raw or boiled with fat into a stew (Ormond, 1965).

Vaginal suppositories for treatment of female troubles can be made from powdered slippery elm inner bark. Pure cold water is added to powdered slippery elm to make a thick paste. The paste is then shaped into pieces about one inch long and one inch thick. They are placed in warm water for a few minutes and then three of them are inserted into the vagina followed by a sponge with a string attached. They are allowed to remain two days, then the sponge is removed and douching is employed to remove the slippery elm. This is an excellent treatment for fallen womb, leucorrhoea, or inflammation and congestion of any part of the womb or vagina.

An excellent poultice can be made by using two parts of powdered slippery elm with one part of any or all of the following: bloodroot, corn meal, blue flag, comfrey, ragweed, and chickweed. The materials are mixed together and warm water is added to achieve the desired consistency. This poultice is useful in cases of dirty wounds, abscesses, inflammations, eruptions, congestions, enlarged prostate or swollen glands of the neck (Kloss, 1973).

The fibers of the bark can be used like basswood fibers for making lacings and cordage (Harlow, 1957).

Celtis occidentalis L.

Folknames. --Hackberry, Sugarberry, Nettle Tree, Hoop Ash.

Habit. --A medium sized tree attaining a height of 40 meters with a short trunk and a round-topped crown.

Bark. --Light gray, furrowed, with short narrow ridges, warty projections or divided flat plates.

Twigs. --Gray-brown, flexible, slender, smooth or hairy, covered with scattered, raised, elongated lenticels; buds light brown, egg-shaped, pointed, 2-3 mm long; leaf scars crescent-shaped.

Leaves. --Deciduous, simple, alternate, ovate to ovate-oblong, 5-12 cm long, oblique and rounded at base, sharply or bluntly pointed apex; toothed margin except for base; bright green and hirsute above, paler and somewhat hairy below; petioles 1.0-1.5 cm long.

Flowers. --April-May. Monoecious. Staminate, pistillate, and perfect flowers may be found on the same tree, male flowers near the base and female flowers toward the tip, flowers short stalked, 5-6 yellow-green sepals with brownish tips, no petals, 5 small stamens with yellow anthers, green, egg-shaped ovary with 2 rough, curved, yellow stigmas.

Fruit. --September-October. Dark purple, berry-like, globular, drupe, 7-10 mm thick, on slender stalks 14-16 mm long, flesh thin, sweet, edible; seed globular, cream-colored, rough, with vein-like ridges.

Habitat. --Prefers moist, rich, well-drained soil but will grow on gravelly uplands too.

Ethnic Remarks. --Celtis is the name given by Pliny to the lotus with sweet berries and was transferred to this plant due to the sweet fruits. The term occidentalis means western and refers to the Western Hemisphere. Hackberry is often afflicted with the disease "witches'-broom" which forms small dense clusters of deformed twigs on the branches. The wood is used for making cheap furniture and boxes (Stephens, 1969).

The sweet fruits are edible and taste somewhat like dried dates. They also have an edible kernel inside the hard stone. These fruits are a valuable survival food because they remain on the trees until late winter. They can be boiled in water to obtain a syrup or eaten fresh or powdered and mixed with parched corn. Carbonized hackberry seeds have been found at a number of archeological sites including the Koster site in the Illinois River Valley and the McGraw Hopewell Site in Ohio. There are also records of hackberry fruits being used by historic Indians (Asch et al., 1972).

Vitaceae--The Grape Family

Vitis riparia Michx.

Folknames. --Riverbank Grape, Wild Grape.

Habit. --A high climbing large vine, sometimes climbing 30 meters into treetops.

Bark. --Red-brown, broken into thin, long, papery shreds.

Twigs. --Tan-brown, flexible, slender, minutely ridged and grooved, older stems with shredded bark; conical red-brown buds. scales with a ridge through the center and often with tan hairs at the tip; crescent-shaped leaf scars.

Leaves. --Deciduous, simple, alternate, heart-shaped, tapered tip, lobed base with a wide space at the petiole, 9-13 cm long and nearly as wide, margin having 2 small side lobes and coarse teeth with concave sides, blade yellow-green above, pale with hairs on the veins beneath; petiole 4-6 cm long.

Flowers. --Mid-May. Dioecious. Flowers in clusters 4-12 cm long; individual flowers small, with green disc-shaped calyx,

yellow-orange disc in the center, 5 greenish-yellow, elliptical petals. Male flowers having 5 stamens, long, erect, spreading filaments, and small yellow anthers. Female flowers often have 5 undeveloped stamens that droop and curl, green, egg-shaped ovary with 3-5 lobes on the stigma.

Fruit. -- July-August. In clusters 5-12 cm long, purple-blue with a whitish film, globular, 6-11 mm diameter, sweet, edible. Seeds red-brown, broadly egg-shaped, 2 grooves on one side.

Habitat. -- Prefers rich soil along rivers, streams, and in woods; often seen along fence rows.

Ethnic Remarks. -- Vitis is the classical Latin name for the grape vine, while riparia pertains to its habit of growing along river banks (Stephens, 1969).

The fruit is tasty, high in vitamin C and potassium, and can be eaten raw, or used in jelly or wine making. The ethnic value of this vine is quite varied and wide. Not only does it made a good swinging vine for dropping off into the swimming hole, but as most East Central Illinois rural children know, five-inch-long segments of the small vines make a good cigar for smoking.

Sap from wild grapevines was collected and used as a beverage by Indians in the Illinois River Valley and the shoots of wild grape plants were gathered and eaten fresh (Zawacki and Hausfater, 1969).

An infusion can be made by placing two ounces of the dried fruit in a pint of boiling water, then straining and cooling. It is most useful in treating dropsy and chronic dysentery. The general dose is one tablespoonful every two or three hours according to the urgency of the symptoms (Scholl, 1949).

The classical Greeks were very much in tune with nature and its cycles. As Edith Hamilton (1963) so aptly relates, the Greeks rejoiced in life and found the world to be beautiful and delightful to live in. Dionysus, the god of the vine, was an important religious figure for them. He was associated with the amazing workings of nature and the power of wine to uplift man to an exultant sense of mastery, to carry him out of himself, and to see that he could be divine. As pictured in Guirand's work (1972), a base relief of Dionysus from Herculaneum portrays him with a diadem of vine leaves and bunches of grapes crowning his curly tresses.

In its beginning the religion of Dionysus was marked by everything in excess--drunkenness, wild orgies and feasts and people shouting, shrieking and dancing wildly over the land in fierce ecstasy. Later Orpheus, Apollo's pupil, reformed the violent Bacchic rites and brought them into order. It was after this refinement that Dionysus was admitted to the Eleusinian mysteries beside Demeter--the goddess of corn and in whose honor they had been founded. Their mysteries, the Orphic, centered in Dionysus, and the Eleusinian, chiefly Demeter's

were a very important force for religion in the Greek and Roman world. Cicero, an initiate, states: "Nothing is higher than those mysteries. . . . They have not only shown us how to live joyfully, but they have taught us how to die with a better hope." Plutarch relates that,

because of those sacred and faithful promises given in the mysteries of Bacchus . . . we hold it firmly for an undoubted truth that our soul is incorruptible and immortal . . . Let us behave ourselves accordingly, outwardly ordering our lives, while within all should be purer, wiser, incorruptible. When a man dies he is like those who are initiated into the mysteries. Our whole life is a journey by tortuous ways without outlet. At the moment of quitting it come terrors, shuddering fear, amazement. Then a light that moves to meet you, pure meadows that receive you, songs and dances and holy apparitions.

In the "Frogs" Aristophanes refers to initiation into the mysteries:

Heracles

Then you will find a breath about your ears
Of music, and a light about your eyes
Most beautiful--like this--and myrtle groves,
And joyous throngs of women and of men--
The Initiated.

It may seem puzzling at first as to how the wild unrestrained Bacchalean rites could have evolved into such a lofty state of spiritual awareness, but it becomes clear when one realizes that noble self-restraint must have something to restrain. As the Greeks could certainly perceive, Apollo needed Dionysus. "He who not being inspired," Plato says, "and having no touch of madness in his soul, comes to the door and thinks he will get into the temple by the help of art--he, I say, and his poetry are not admitted." The religion of the mysteries was the individual search for personal awareness and liberation. It steered

men toward union with God. When initiated into the mysteries each person was required to take an oath not to reveal them, and their influence was so strong that evidently no one ever did. All we can be sure of is that they awakened a deep sense of awe and reverence and offered purification from sin and that they promised immortality (Hamilton, 1963). Thus Dionysus, this god of the vine, played an important role in spiritual development and pure mediation of the life force.

GLOSSARY OF ETHNOBOTANICAL-MEDICAL TERMS

agues - fever, fit or spell of shaking or shivering, often malarial in character.

alterative - helps alter or correct the symptoms of minor functional disorders.

antiferment - prevents fermentation.

antihelminthic - substance that causes the death or removal of intestinal worms.

antiperiodic - reduces fever and prevents its recurrence.

antiphlogistic - an agent reducing inflammation or fever.

antipyretic - an agent reducing temperature.

antiseptic - substance effective against bacteria thus preventing infection.

antispasmodic - allays or helps prevent the recurrence of spasms.

aphrodisiac - arousing sexual desire.

aromatic - of or having a fragrance.

astringent - an agent producing contraction of tissues or the arrest of a discharge.

binding - contracting body tissues.

catarrh - inflammation of a mucous membrane.

cathartic - producing evacuation of the bowels.

cholagogue - a medicine that promotes the flow of bile.

debility - weakness, feebleness, langour of body.

decoction - a liquid preparation obtained by boiling plant parts in order to extract the active principles.

deobstruent - removes obstructions from various organs.

diaphoretic - increases perspiration; an aid in eliminating waste products through the skin.

discutient - a medicine removing a swelling or effusion.

diuretic - helps to increase the flow of urine and improve the elimination of wastes through the urine.

dropsy - an abnormal accumulation of serous fluid in the body.

dyspnoea - difficult or labored respiration.

eczema - inflammation of the skin with exudation of lymph.

emetic - causing vomiting.

expectorant - helps facilitate expulsion of mucous from the respiratory tract.

febrifuge - a drug that reduces fever.

gleet - chronic inflammation of a bodily orifice usually accompanied by an abnormal discharge.

gout - a disease associated with joint inflammation, swelling, and uric acid in the blood.

hectic fever - fluctuating but persistently recurrent fever such as with tuberculosis and septicemia.

herpetic - skin lesions characterized by blisters containing clear fluid; of or resembling herpes.

hypertrophy - abnormal increase in the size of an organ or a part.

incontinence - without self restraint in regard to sexual activity.

infusion - the process of extracting the active principle of a substance by means of hot water without boiling; or the extract.

leucorrhoea - a white discharge from the vagina.

mania - wild or violent insanity.

moxa - cauterizing agent.

narcotic - drug that dulls the senses, relieves pain and induces sleep.

nervine - drug that quiets nervous strain due to excitement, fatigue, overstrain, or headache.

neuralgia - severe pain along the course of a nerve.

ophthalmia - inflammation of the conjunctiva or of the eyeball.

palpitation - violent pulsation, as of the heart.

parturition - childbirth.

pectoral - pertaining to the breast; a remedy for chest diseases.

physic - a cathartic.

poultice - a hot, soft mass of material applied to a sore part of the body.

purgative - a drastic cathartic.

sciatica - pain along the sciatic nerve or its branches and especially in the leg caused by compression, inflammation, or reflex mechanisms.

scrofula - a tubercular disorder causing swelling of the lymph glands.

scurvy - a form of purpura due to a lack of ascorbic acid in the diet.

sedative - allays nervous irritability.

sudorific - a strong diaphoretic.

tetter - skin disease producing scaly eczema; psoriasis.

thrush - a mycotic disease of the upper digestive tract characterized by the formation of white plaques within the oral cavity often coalescing in a false membrane (caused by Candida albicans).

tonic - a medicine which tends to restore normal tone.

vertigo - giddiness; dizziness.

yaws - a tropical, infectious skin disease causing ulcerated lesions and bone infection in the late stage (caused by the spirochete Treponema pertenuae).

LITERATURE CITED

- Angier, Bradford. 1968. *Living Off The Country*. Stackpole Books - The Telegraph Press. Harrisburg, Pennsylvania.
- Asch, Nancy B.; Ford, Richard I.; and Asch, David L. 1972. *Paleoethnobotany of the Koster Site*. Reports of Investigations, No. 24. Illinois State Museum. Springfield, Illinois.
- Bethel, May. 1971. *The Healing Power of Herbs*. Wilshire Book Company. Hollywood, California.
- Canby, Courtlandt. 1961. *The Epic of Man*. Time Incorporated. New York, New York.
- Cavendish, Richard. 1970. *Man, Myth, and Magic, Volume 1*. Marshall Cavendish Corporation. New York, New York.
- Culbreth, David, M.R. 1927. *A Manual of Materia Medica and Pharmacology*. Lea and Febiger. Philadelphia, Pennsylvania.
- Culpeper, Nicholas and Simmonite, W. J. 1957. *The Simmonite-Culpeper Herbal Remedies*. Universal-Award House Incorporated. New York, New York.
- Deam, Charles C. 1932. *Shrubs of Indiana*. Wm B. Burford Printing Company. Indianapolis, Indiana.
- Densmore, Frances. 1974. *How Indians Use Wild Plants for Food, Medicine, and Crafts*. Dover Publications. New York, New York.
- Deuel, Thorne. 1958. *American Indian Ways of Life*. Story of Illinois, Series Number 9. Springfield, Illinois.
- Ehrlich, Paul. 1976. *Speech on environmental problems given February 5, at Eastern Illinois University, Charleston, Illinois.*

- Fernald, M. L. and Kinsey, A. C. (Revised by R. C. Rollins). 1958. *Edible Wild Plants of Eastern North America*. Harper and Row. New York, New York.
- Gibbons, Euell. 1971. *Stalking the Wild Asparagus*. David McKay Company. New York, New York.
- Goodwin, Ruth K. "Folk Remedies." *Prairie Farmer*, September 6, 1975, p. 89.
- Grieve, M. 1971. *A Modern Herbal*. Dover Publications. New York, New York.
- Guirand, Felix. 1972. *New Larouse Encyclopedia of Mythology*. Prometheus Press. Hong Kong.
- Hall, Allan. 1973. *The Wild Food Trailguide*. Holt, Rhinehart, and Winston. New York, New York.
- Hamilton, Edith. 1963. *The Greek Way to Western Civilization*. The New American Library of World Literature Incorporated. New York, New York.
- Harlow, William M. 1957. *Trees of the Eastern and Central United States and Canada*. Dover Publications, Incorporated. New York, New York.
- Harris, Ben Charles. 1972. *The Compleat Herbal*. Barre Publishers. Barre, Massachusetts.
- Hill, Albert F. 1952. *Economic Botany*. McGraw-Hill Book Company, Incorporated. New York, New York.
- Hosie, R. C. 1973. *Native Trees of Canada*. Canadian Forestry Service. Department of the Environment. Ottawa, Canada.
- Jaeger, Ellsworth. 1966. *Wildwood Wisdom*. The Macmillan Company. New York, New York.
- Jaques, H. E. 1946. *How to Know the Trees*. William C. Brown Company. Dubuque, Iowa.
- Kadans, Joseph M. 1970. *Modern Encyclopedia of Herbs*. Parker Publishing Company. West Nyack, New York.
- Kloss, Jethro. 1973. *Back to Eden*. Woodbridge Press. Santa Barbara, California.

- Krochmal, Arnold and Connie. 1973. *A Guide to the Medicinal Plants of the United States*. Quadrangle, The New York Times Book Company. New York, New York.
- Li, Hui-lin. 1972. *Trees of Pennsylvania, the Atlantic States and the Lake States*. University of Pennsylvania Press. Philadelphia, Pennsylvania.
- Lucas, Richard. 1969. *Common and Uncommon Uses of Herbs for Healthful Living*. Parker Publishing Company. West Nyack, New York.
- Medsker, O. P. 1972. *Edible Wild Plants*. Collier Books. New York, New York.
- Meyer, Joseph E. 1970. *The Herbalist*. Sterling Publishing Company Incorporated. New York, New York. (Revised and enlarged by Clarence Meyer.)
- Ormond, Clyde. 1965. *Complete Book of Outdoor Lore*. Outdoor Life - Harper and Row. New York, New York.
- Ritzenthaler, Robert E. and Pat. 1970. *The Woodland Indians of the Western Great Lakes*. The Natural History Press. Garden City, New York.
- Saunders, Charles F. 1934. *Useful Wild Plants of the United States and Canada*. Robert M. McBride and Company. New York, New York.
- Scholl, Frank B. 1949. *Library of Health*. Historical Publishing Company. Philadelphia, Pennsylvania.
- Stephens, H. A. 1969. *Trees, Shrubs, and Woody Vines in Kansas*. The University Press of Kansas. Lawrence, Kansas.
- Tehon, Leo R. 1942. *Fieldbook of Native Illinois Shrubs*. Illinois Natural History Survey. Urbana, Illinois.
- Tobe, John H. 1973. *Proven Herbal Remedies*. Pyramid Communications Incorporated. New York, New York.
- Vogel, Virgil J. 1970. *American Indian Medicine*. University of Oklahoma Press. Norman, Oklahoma.

- Weiner, Michael A. 1972. *Earth Medicines - Earth Foods*. The Macmillan Company. New York, New York.
- Wheelwright, Edith Grey. 1974. *Medicinal Plants and Their History*. Dover Publications. New York, New York.
- Winters, Howard D. 1969. *The Riverton Culture*. Published jointly by the Illinois State Museum and the Illinois Archeological Survey. Springfield, Illinois.
- Wren, R. C. 1968. *Potter's New Cyclopoedia of Botanical Drugs and Preparations*. Health Science Press. Rustington, Sussex, England.
- Zawacki, April A., and Hausfater, Glenn. 1969. *Early Vegetation of the Lower Illinois Valley*. Reports of Investigations, Number 17. Printed by the Authroity of the State of Illinois. Illinois State Museum. Springfield, Illinois.