Birch_And_Its_Uses_1993.txt

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LATIN NAME: Betula papyrifera Marshall (164-144)

OTHER LATIN NAMES: B. papyracea (369-37);

COMMON NAMES:

Paper Birch, White Birch, Canoe Birch (164-144); Spool Wood (369-37); Western Paper Birch (137-195); wi'gwasa'tig (Chippewa, 211-288); k'i (birch tree, Carrier, 251-298); kwelh7in (birch-bark container, Lillooet, 148-57); Haawk, Waawg (Birch tree, Tsimshian, 243-35); haawak (Birch tree, Gitksan, 358-11); bouleau blanc (French, 435-2206); wi'gwasa'tig (Chippewa, 435-2259); wigwas (Ojibwa, 435-2259); wuskwi (Cree, 435-2259); lhenxwmes (Kwakiutl, 150-279); Belaya Bereza (Russian, 215-38); Tree of Life (Siberian shamanism, 208-211); bhurja (Sanskrit, 208-218);
DESCRIPTION OF PLANT:

APPEARANCE: Probably the most variable tree species in Canada. A tree up to 30 m tall, with variously coloured but commonly white bark, smooth and marked

with conspicuous brown horizontally elongated lenticels, readily peeling in sheets. Crown oval or columnar, with ascending branches. Branchlets dark brown even on white-barked individuals, spreading or sometimes pendulous. Slender twigs pubescent with long hairs, and occasionally glandular. Juveniles with smooth brown bark. In winter distant stands appear reddish, and streaked by the frequent white trunks. (164-144); The shoots are hairy when young and slightly glandular. (403-136); Large deciduous tree 30 m, occasionally 40 m tall. (403-136); Birches are deciduous, wind-pollinated trees with alternate, simple leaves. (403-136); A small to medium, deciduous tree up to 15-20 m (50-65 ft) high, the young twigs usually hairy and often glandular (137-195);

LEAVES: Leaves ovate (4-) 5-9 cm long, doubly or simply serrate, dull-surfaced, the undersides variously pubescent with long hairs, especially along the midvein, with tufts of hairs in vein axils, and sometimes minutely glandular. The foliage turns light yellow in the fall. (164-144); The leaves ovate, 4-10 cm long, with flat or heart-shaped base (403-136); The leaf blades, 4-7 cm (1.6-2.8 in.) long, are oval-shaped to nearly round or slightly heart-shaped, sharply pointed, and coarsely or finely toothed. The leaf stalks generally exceed 15 mm (0.6 in.) in lenght (137-195);

FLOWERS: All catkins pendulous when mature. Fruiting catkins tapering toward ends, with strongly overlapping bracts; generally 2 together (sometimes 1) from spur shoots with 2 or occasionally 3 leaves. Bracts with long terminal lobe and ascending or diverging rounded lateral lobes that are relatively short in western forms, ciliate and puberulent. (164-144); Male and female flowers borne on the same tree. The male flowers are reduced to a mere two perianth segments and two stamens. The latter, however, are cleft, consisting of a two-branched filament, each branch terminated by half an anther (a single pollen sac). The female flowers have no perianth. The pistils have two stigmas; in the two-chambered ovary only a single ovule develops into a seed. In the slender male catkins there are three naked flowers to every bract. Only the central flower has bracteoles that unite with the bract to form a three-lobed scale. At maturity, in winter, the female catkins disintegrate

and the winged fruits (achenes) drop and are dispersed together with the bracts." (403-137); The flowers are borne in separate male and female catkins, the former long and clustered, the latter shorter and usually single (137-195);

FRUIT/SEEDS: Samaras 3 per bract, with broad wings, the lateral samaras in a group sometimes with 1 wing much reduced. (164-144); The male catkins are large, up to 10 cm long when ripe. The female catkins develop into a structure about 5 cm long. (403-136); It is propagated by seed, sown in early spring (March and April); in practice it is sometimes sown on snow. (403-136); Wings twice as wide as the seed in their middle. The catkins on stalks, smooth, 3-5 cm long. (369-37); The catkin scales are shed with the fruits, which are small with lateral wings (137-195); The seed readily germinates and often makes birch a rapid colonist of abandoned or cleared land (258-12).

> NOTE: Birch seeds will not stand much drying out, and young trees are therefore typical of moist places. The seeds when first shed require temperatures as high as 90oF. to induce sprouting; but after lying at winter temperatures for several months, they will in spring sometimes germinate in melting snow, a feature not common in woody plants. (71-116)

TWIGS: Reddish brown, slender; terminal bud, lacking except on spur shoots which are conspicuous features: lateral buds, broadest near the base, sticky when pressed between the fingers (71-123);

BARK: The bark when mature is reddish-brown to chalky white, usually peeling readily in horizontal strips and separating into thin layers (137-195); Most birches are noted for their white bark but Canoe Birch has the whitest bark of all. Though it is blackish brown on the young shoots, on the trunk and thick branches it is smooth and white with prominent horizontal lenticels, and peels off in thin layers.(403-136); At first, and usually until the tree is serveral inches in diameter, reddish brown, then peels off to show the new white layers beneath; eventually, entirely chalky white and peels off in papery curls; on

old trees, black near the base of the trunk." (71-125);

- 1987 Eleanor G. Viereck, Alaska's Wilderness Medicines, pg. 9. "Twigs growing above the reach of browsing moose have a smooth bark, but the lower ones are covered with white bumps called lenticels. The lenticels are believed to be associated with defense against browsing herbivores." (407-9)

HABITAT: A transcontinental forest tree, B. papyrifera may be found in dry upland or alluvial sites. (164-144); Canoe Birch, like Silver Birch, is very adaptable, tolerating dry as well as wet and poor soils. (403-136); Grow in environments ranging from dry slopes to muskeg and peat bogs (305-40); Moist, open woods along streams and lake edges from valley bottoms to moderate elevations in the mountains (137-195); Found mostly on moist sandy soils; especially common after fires, mixed with trembling aspen and fire cherry (71-125);

RANGE: Canoe Birch is native to North America, its range extending from Labrador to British Columbia and south to Pennsylvania, Michigan, Nebraska and Montana. It is very hardy. (403-136) Nfld., Lab., N.B., P.E.I., N.S., Que., Ungava Bay, Ont., Great Bear L., Yukon and Alaska, s. to Wash., Mont., Colo., Nebr., Minn., Pa. and N.Y. (369-37); Widespread throughout the Interior (of B.C.), and also common in some areas of the Coastal Mainland; rare on Vancouver Island and not found on the Queen Charlotte Islands. At least three varieties are distinguished in the Province (137-195);

NOTE: Gleason and Cronquist 1963 consider it perhaps a circumboreal species with European B. alba. (369-37).

VARIETIES: Many varieties of this species have been described, some of them being hard to recognize. The wide diversity in character of all parts is further extended by frequent crossing with B. occidentalis, B. neoalaskana, and B. pumila. (164-144);

KEY TO VARIETIES

1a. Leaf base rounded, truncate, or cordate. Bract with ascending lateral lobes..... 2.

1b. Leaf oval or rhombic, cuneate at base, biserrate. Bract with lateral lobes diverging almost at right angles from central lobe. Mature bark white, or yellowish- or reddish-brown or dark grey, the darker kinds tending to resist peeling.....var. commutata (Regel) Fernald

Variety commutata occurs commonly in the Lower Fraser Valley and on the Coast, and scattered with var. papyrifera inland, and less commonly eastward, especially in moist areas. The brown bark, which tends to peel less readily than white bark, is often associated with humid habitats, and may be a physiological effect of environment. Bark colour was not mentioned in the orginal description of var. commutata, and its employment as the distinguishing feature of this variety by Fernald (1945) and other recent authors has led to some confusion in the classification of birches. At Sumas Prairie, the type locality of this variety, trees commonly, but by no means always, have yellowish-brown bark. (164-144)

Other Latin Names: Betula alba subsp. occidentalis (Hook.) Regel, var. commutata Regel; B. papyrifera var. occidentalis Sarg. (not B. occidentalis Hook.) B. papyrifera subsp. occidentalis Hult. (342-367)

2a. Leaf ovate, normally 5-7 cm long, rounded to truncate at base, acuminate at apex, serrate, or biserrate. Twig pubescent, not glandular. Mature bark always white.....var. papyrifera

Variety papyrifera is the common form across most of Canada, and occurs in the Interior of British Columbia. (164-144)

2b. Leaf almost circular, truncate to cordate at base, acute at apex, usually less than 5 cm long, stiff. Twig glandular, sparsely pubescent. Mature bark

white or brown.....var. subcordata (Rydberg) Sargent

Variety subcordata has been shown by J.R. Dugle (1966) to be an introgressant resulting from crossing of B. papyrifera with B. occidentalis. (164-144)

SOME SIMULAR SPECIES:

1. Betula glandulosa Michaux (164-137)

OTHER LATIN NAMES: B. nana L. var. sibirica Ledebour in part, B. nana L. ssp. exilis (Sukatschev) Hulten (164-137);
NOTE: In the "Flora of Alaska and Neighboring Territories", by Eric Hulten, Betula nana L. subsp exilis (Sukatsch.) Hult and Betula glandulosa Michx. are treated as separate plants entirely. (342-365)

COMMON NAMES: Bog Birch, Dwarf Birch (164-137);

DESCRIPTION: Ascending or spreading shrub up to 2 m high. Twigs distinctly roughened with a dense sprinkling of minute pale grey or yellowish, resinous wart-like glands, and inconspicuously puberulent with very short hairs between the glands. Older branches and stems dark grey-brown to blackish (164-137);
LEAVES: Leaves nearly orbicular, sometimes wider than long, 1-2.5 cm long, rounded at the base and broadly rounded to truncate at apex, crenate-dentate with 10 or fewer teeth each side, and with 3 or fewer lateral veins each side, stiff and shiny, glandular-dotted beneath; turning deep orange in the fall (164-137);

CATKINS: Catkins less than 10 mm long in winter, flowering with the appearance of the leaves in spring; the staminate catkins expanding to 1-2 cm long; the pistillate catkins erect, becoming 10-15 mm long in fruit. Samara with wing less than 1/2 as wide as the central nutlet body." (164-137)

HABITAT: A plant typically of bogs and seepage areas at low elevations, and to some extent on dry unland sites especially at alpine levels (164-137);

RANGE: It ranges across the continent from the east side of the Coast and Cascade Ranges to Northwestern

Quebec (164-137);

OTHER: In the fall, extensive colonies of this species become conspicuous by reason of the deep orange to russet colours that they assume (164-137);

2. Betula pumila L. (164-151)

COMMON NAMES: Dwarf Birch (164-151); Low or swamp birch (435-2259); Bouleau nain (French, 435-2259); bine micins (Ojibwa Pillager, 435-2259);

DESCRIPTION: Ascending shrub up to 3 m tall. Stems dark brown. Twigs pubescent, often densely so, and glandular or not (164-151);

LEAVES: Leaves obovate to nearly orbicular, 1.5-3 (-4) cm long, cuneate or rounded at base, acute to obtuse or rounded at apex, simply crenately toothed with 10 or more teeth each side, and with 3 or 4 or more lateral veins each side of the midvein, tough and shiny, on short petioles up to 5 mm long; foliage turning deep orange in the fall (164-151);

FRUIT: Fruiting catkins erect, single on very short spurs, 1-3 cm long. Bract with ascending lateral lobes shorter than the terminal lobe. Samara with wings narrower than, but at least half as wide as the central nutlet body (164-151);

HABITAT: Var. glandulifera Regel is the common variety of the species in British Columbia, the typical form being found east of the coastal ranges (164-151);

RANGE: This is a transcontinental species, found in bogs and other areas of poor drainage (164-151);

3. Betula neoalaskana Sargent (Alaska Birch, Northwestern White Birch):

OTHER LATIN NAMES: B. resinifera (Regel) Britton as to description only, not type. B. alaskana Sargent, not Lesquereux. [Not B. papyrifera var. humilis (Regel) Fernald & Raup, which = B. minor (Tuckerman) Fernald]. (164-139); Betula alba subsp. papyrifera var. humilis Regel; B. papyrifera var. humilis (Regel) Fern; B. papyrifera var. neoalaskana (Sarg.) Raup; B. alaskana Sarg.; B. resinifera Britt. (342-367);

DESCRIPTION: Tree, usually 10-15, rarely up to 20 meters tall; with trunk up to 60 cm in diameter and white bark; young twigs strongly resiniferous; leaves yellowish-green, ovate, with elongated apex and cuneate or truncate base, serrate, glabrous above and in margin, resin-dotted below, with tufts of hairs in angles of nerves below; catkins short, thick, greenish-brown; bracts with median lobe usually longer than the blunt, diamond-shaped, lateral lobes; nutlets with wings broader than body. (342-367)

RANGE: Common in the lowlands; to 800 meters in McKinley Park; to 1,200 meters in the Yukon. Forms hybrid with B. kenaica as well as hybrids with B. nana subsp. exilis and B. glandulosa. (342-367)

4. Betula occidentalis Hooker (Water Birch, Black Birch):

OTHER LATIN NAMES: B. fontinalis Sargent, B. papyrifera Marshall var. occidentalis (Hooker) Sargent. (164-142); Betula microphylla of American authors; B. glandulosa X resinifera of Fl. Alaska & Yukon; B. commixta Sarg; B. Eastwoodae Sarg.; B. Beeniana Nels (342-366);

DESCRIPTION: Dark, coppery-red to purplish-brown bark which does not separate easily into layers (137-195); Under this name is included a number of shrubs (or, rarely, small trees), smaller than the tree birches but larger than B. glandulosa, which are characterized by highly variable form and serrulation of the leaves; variable pubescence and short catkins; leaves that are mostly ovate and acute, often with finely pubescent petioles; twigs that are very densely glandular; and not uncommon occurrences of specimens lacking fructification." (342-366)

5. Betula pendula Roth (Weeping Birch, Bouleau, Common Birch, European Birch, White Birch [164-147,438-42]; White Birch, Canoe Birch, Paper Birch [195-117]; Berke, Bereza [141-103]); Silver Birch, Bouleau blanc (French), Bouleau verraqueux (French), Birke (German), Weissbirke (German) [439-198]; European White Birch (71-128); Lady Birch (394-95);

OTHER LATIN NAMES: B. alba Linn., in part. B. verrucosa Ehrhart. (164-147); Monoecia triandria, B. pubescens (141-103);

NOTE: The common birch (Betula alba; sometimes divided into the species B. pendula or silver birch and B. pubescens or downy birch) is a tree...found in the hilly regions of Europe, Asia and North America (90-222).

APPEARANCE: Tree, up to 30 m (98') high (438-42); A small tree characterized by its papery-white bark which peels away in strips. Base of trunk grey, rough; branches have small warts on their surface (439-199); The tree is monoecious (439-199);

LEAVES: Leaves are more triangular, the angles of the base being somewhat rounded (distinction from allied species), 4-7cm (1.5-2.75in) long with serrately toothed margin. Taste of leaf: bitter, slightly aromatic (438-42); Leaves deciduous, alternate, pointed, oval, turning yellow in autumn (439-199); The leaves are stalked, oval or broadly triangular with a double-toothed margin. They are 2-7 cm. long. The young leaves are covered in downy hairs but the mature leaves are smooth (119-276);

FLOWERS: Flowers April to May (439-199); The male and female flowers are borne in separate pendant catkins.

The male catkins have flowers with brown bracts and yellow stamens. The female flowers have light green bracts and purple stigmas (119-276);

FRUIT: the fruit is an achene (439-199); The fruits are winged nutlets, the wing being formed from fused bracts (119-276);

TWIGS: Branches often pendulous; when young bearing many minute rough and resinous scaly glands. Free from hairs (in some allied species the branches are downy and not scaly)(438-42); The twigs are brown and covered in flat-topped resin-glands (119-276);

BARK: with white bark marked with black (diamond-shaped) patches (438-42); The white colouring comes from the cells in the bark which contain a substance called betulin (119-276); The bark at the base of the trunk is fissured and black (119-276);

HABITAT: Common in lowland areas; cool woods, damp soils. (439-198); Grows abundantly in open deciduous and coniferous forests as admixture and undergrowth, in clearings, on slopes and rocky hillsides, often with a ground cover of heath, from lowland to mountain elevations. Generally found on acid, sandy-loamy to sand, stony and peaty soils (38-86); It is found all over Europe, as well as in the Caucasus, in Siberia and Asia Minor. It forms large forests in Finland and in Russia (119-276);

RANGE: Widespread in northern and central Europe and in mountainous areas of southern Europe; common in woods and copses throughout Britain. (438-42); Europe, from Sicily to Iceland. Northern Asia. (141-103);

Has long been planted in towns and gardens, across N. America (000-25); The range of distribution embraces Europe, the Middle East and western Siberia, south to the Altai and east to about longitude 100o E. (38-86);

DESCRIPTION OF B. alba: Grows to a height of 65 feet. It has white bark which can be peeled off in horizontal strips. Its leaves are cordate, bright green above and lighter beneath, serrate, and glabrous or minutely hairy. The flowers are borne in male and female catkins, the female developing into seed cones. (195-118). RANGE OF B. Alba: Northern U.S., Canada, and northern Europe. (195-118)

6. Betula pubescens Ehrhart (Silver Birch):

OTHER LATIN NAMES: B. alba L., in part. (164-149)

DESCRIPTION: Tree up to 20 m tall. Bark silvery-grey and smooth, remaining so on nld trunks. Branches ascending nr spreading. Twigs finely, though often sparsely, puberulent with very short hairs, sometimes glandular. Leav ovate, rounded to truncate or cordate, or sometimes broadly cuneate at base, acute at apex, puberulent beneath. Catkins normally single, the fruiting ones 1-2 cm long. Fruiting bracts with lateral lobes ascending, or sometimes recurved, rlightly shorter to longer than the terminal lobe. Stigmas exceeding samara wings. (164-149)

RANGE: Introduced from Europe as an ornamental street tree, this species is occasionally seen growing in the peat lands of the Fraser River delta and on southern Vancouver Island. In the former area it is accompanied by B. pendula and intermediates between them, and by B. papyrifera. (164-149)

7. Betula humilis (Birch):

DESCRIPTION: A Euro-Siberian species whose range extends to northern Asia and the Altai Mountains. It grows on moorland an on peaty soils as a component of deciduous shrub communities. (403-134);

8. Betula maximowicziana (Maximowicz's Birch):

DESCRIPTION: This birch is native to Japan and was introduced into Europe around 1890. It is only seen in collections and some large gardens in Britain. (403-137);

9. Betula lutea (Yellow Birch; Merisier (French, 435-2206); wi'nisik (Ojibwa, 435-2230); wi'umis'sik (Ojibwa, 435-2259);

OTHER LATIN NAMES: Betula alleghaniensis Britt. (279-122, 98-47)

DESCRIPTION: It yields high quality wood called 'American birch'. The leaves give off a pleasant fragrance when rubbed between the fingers. (403-137);

APPEARANCE: A medium-sized forest tree, 60 to 70 ft high and 1 to 2 ft. in diameter (max. 100 by 4 ft). In the forest, the trunk is relatively clear of branches and supports an irregular crown; the roots are shallow and wide-spreading. (71-118);

LEAVES: Alternate (on spur shoots appearing opposite or whorled), simple, 3 to 4 in. long, 1 to 2 in. wide, ovate to oblong-elliptical, sharply doubly serrate, smooth above, sometimes tufted hairy below, in the vein axils. (71-118); Leaves have a large number of veins (11 pairs). (403-137);

FLOWERS: Male and female borne in separate catkins on the same tree; male catkins present during the winter, female developing from buds the following spring. (71-118);

FRUIT: A minute winged nutlet (seed) borne in large numbers in an ovoid cone whose scales fall tardily from the axis at maturity; cone upright, about 1 1/2 in. long. (71-118)

TWIGS: Greenish brown, slender, aromatic (oil of wintergreen); terminal bud, lacking except on spur shoots which are conspicuous features. (71-118);

BARK: At first, bronze in color, thin, readily peeling in papery curls; later, changing to coarse scaly plates. (71-118); The bark is yellow-brown, peeling in rolls. (403-137);

HABITAT: A cool, moist site is most typical for this tree. (71-118); Rich woodlands, lower slopes, and occasionally cool marshlands, usually below 1000 meters (3300 ft) elevation. (279-122)

DISTRIBUTION: The Lake states, southern Canada, the northeast, and in the Appalachians to northern Georgia. (71-118); It is native to the region from Newfoundland to Manitoba and south to Georgia and Tennessee. (403-137); Typical component of the hardvood forests from Nova Scotia to central Ontario and extending into

the boreal forest refion in eastern Canada (98-47);

10. Betula lenta L. (Black Birch, Cherry Birch, Mountain Mahogany, Sweet Birch [362-104]; Mahogany birch, Spice Birch [195-118]; merisier rouge (435-2230); djo'djo'ra (Iroquois, 435-2230); winsik (Ojibwa, 435-2259); kade-wigwas
(Chippewa, 435-2259); wuskwi (Cree, 425-2259); Mahogany Birch (394-95);

APPEARANCE: Averaging 50-60 feet tall, with a trunk 2-3 feet in diameter, black birch is known for its wintergreen scent and mahogany-red to gray bark (372-104); Maximum size is 80 by 5 ft., with a somewhat tapering trunk and narrow rounded crown (71-120);

LEAVES: The ovate, pointed leaves occur alternately in pairs and are finely serrate (195-118); Slender branches bear thin, pointed leaves 2-5 inches long and hairy underneath.(372-104); On spur shoots appearing whorled or opposite. Leaves are simple, 2.5 to 5 in. long, 1.5 to 3 in. wide, ovate to oblong-ovate, sharply singly serrate or inconspicuously doubly serrate, more heart-shaped at the base than those of yellow birch, smooth above, often with tufts of hair in the vein axils below (71-121); Leaves Turn brilliant gold briefly in the fall (71-121);

FLOWERS: The flowers grow in male catkins about 3 inches long and female catkins about 1 inch long, the male appearing in the fall and the female the following spring (195-118); Reddish brown flowers (April-May) grow in dangling [male pollen-bearning] clusters (catkins) on the same tree with pale green female ones (372-104); The female, or seed-bearing, catkins are stout, upright, and solitary (98-47);

FRUIT: One-inch cones contain numberous tiny [three-lobed scales] winged [heart-shaped] seeds (the true fruit). (372-104); A minute winged nutlet (seed) borne in large numbers in an oblong-ovoid cone whose scales fall tardily from the axis at maturity [late fall]; cone, upright, about 1.5 in. long (71-121);
TWIGS: Dark brown, slender, aromatic (oil of wintergreen); terminal bud, lacking except on spur shoots which are conspicuous features; lateral buds, sharp pointed (more so than that of yellow birch). (71-121); Non-peeling, sweet, aromatic, black bark, often smooth...not papery (000-294);

BARK: The bark is brown when the tree is young, dark gray later, and is horizontally striped. On old trees the bark is more irregularly broken (195-118); Has smoky gray-black to dark red bark with purplish flakes (71-121); Nearly black (resembling that of black cherry), at first smooth, eventually scaly plated (71-121);

HABITAT: Most typical on cool, moist sites (71-121); ..grows best in rich, rather moist woods, it can adapt itself to a variety of conditions, often starting on old logs or stumps or perched on rocks or growing from cracks or seams of rocks (7-204); It prefers deep, rich soils, and always grows scattered among other hardwood trees (98-47);

RANGE: Grows from southern Canada south through the Appalachian Mountains and as far west as Ohio (372-104); The range of sweet birch in Canada is extremely limited. Authentic collections have been made in only southeastern Ontario west of Port Dalhousie. In the United States it grows east to Maine, west to Iowa, and southwards to Tennessee (98-47);

11. Betula populifolia Marsh. (B. alba var. populifolia): American White Birch (369-37); Gray Birch (000-24);

APPEARNACE: Small tree to 10 m (369-37); A small tree, 20 to 30 ft. high and 6 to 12 in. in diameter (max. 50 by 1.5 ft.), with a slinder trunk and open, pyramidal crown. A common feature is the occurrence of several trees in a group, all apparently coming from the same root system (71-126);

LEAVES: distinctively lonf-tailed leaves (000-24); The leaves with two sets of teeth, smooth beneath when old, bright green above, paler beneath (369); Alternate (on spur shoots appearing opposite or whorled), simple, 2.5 to 3 in. long, 1.5 to 2.5 in. wide, triangular, narrowly pointed, and doubly serrate, essentially smooth above and below, somewhat sticky when young (71-127);

FLOWERS: Catkins on stalks 13-30 mm. (369-37); Male and female borne in separate catkins on the same tree; preformed male catkins present during the winter (71-127);

FRUIT: A minute winged nutlet (seed) borne in large numbers on a cylindrical cone whose scales fall readily when mature; cone, pendent or spreading, about 3/4 in. long (71-127);

TWIGS: Reddish brown, slender, covered with numerous warty glands; terminal bud, lacking except on spur shoots which are conspicuous features; lateral buds, spindle shaped, widest near the middle, somewhat sticky (71-127);

BARK: Has very white bark with black 'Chinaman moustaches' where branches have arisen (000-24); smooth pure

white bark that is difficult to separate into thin sheets (369-37); At first dark brown, latter dull grayish white, smooth, does not peel so readily as that of white birch (71-127);

HABITAT: Common and prolific, even on the poorest of dry, sterile soils (71-127); in woods and old fields (369-37);

RANGE: N.B., P.E.I., N.S., Que. City, Ont. n. to Ottawa, s. to n. Del., Pa., O., nw. Ind. (369-37); Newfoundland south to northern Delaware, southwest along the St. Lawrence River and to Western New York and Pennsylvania (isolated areas in Indiana at the foot of Lake Michigan).

REMARKS: Gray birch is one of the most characteristic and aggressive trees of New England, commonly in mixture with pitch pine and scrub oak. On better soils, gray birch is also found with young white pine; and although at first it serves as a protecion, later it crowds out the pine. This birch follows fire, much as does trembling aspen and, like it, is short-lived and more or less of a "weed tree", although the wood is used for spools and other small articles (71-127);

CLASSIFICATION:

CLASS: Angiospermae (Flowering Plants, 164-10, 118-10)

SUBCLASS: Dicotyledonae (Dicots, 164-10, 118-10)

SUPERORDER: Hamamelidae (118-14)

ORDER: Salicales (Willow, 164-10), Fagales (118-14)

FAMILY: Betulaceae (Corylaceae) (Birch, 164-13)

- 1969 R.C. Hosie, Native Trees of Canada, pg. 154. "Probably 50 or more species of birch, varying from dwarf shrubs to trees, grow in the north temperate and arctic regions of the world. The actual number has still not been ascertained, because relationships are not completely understood and distinctions between species are often obscured by hybridization. About 10 species are distributed in Canada, six of which are trees." (39-154)

- 1976 T. Christopher Brayshaw, Catkin Bearing Plants of British Columbia, B.C. Provincial Museum, No. 18 Occasional Paper Series, pg 127. "Deciduous trees and shrubs with alternate, simple, pinnately veined, toothed leaves with caducous stipules. Buds with 2 to several scales. Flowers unisexual, monoicous, wind-pollinated, apetalous, in separate staminate and pistillate catkins. Staminate flowers in elongating hanging catkins, 2 or more flowers with their bractlets adnate to a subtending bract, and arising together at each node in the catkin axis. Stamens 2 to several. Pistillate flowers either subtended by or enveloped by bracts and bractlets. Ovary incompletely 2-chambered, with 2 ovules. Fruit a one-seeded nut or small samara (winged nutlet). Seed germinated epigaeous (the cotyledons raised above the ground). B.C. genera: Corylus (Hazelnut), Alnus (Red Alder, Betula (Birch)." (164-127)

- 1978 V.H. Heywood, Flowering Plants of the World, pg. 59. "A family of trees and shrubs which includes the birches (Betula), Alders (Alnus), Hazels (Corylus) and Hornbeams Carpinus)...The family belongs predominantly to the north temperate regions, though also occurring on tropical mountains, the Andes of South America and in Argentina." (118-59)

- 1978 V.H. Heywood, Flowering Plants of the World, pg. 59. "The Betulaceae is generally though to belong with the Fagaceae to the order Fagales, but each family is often placed in its own order. Some workers now go further and split up the Betulaceae, recognizing each of the three tribes as a family in its own right: Betulaceae, Corylaceae and Carpinaceae." (118-59)

- 1991 Alan Mitchell, Trees, pg. 24. "The Birches are a group of about 50 species which grown around the northern circumpolar plains and to the south from FL and Spain to China. Many are only shrubs and seven are native North American trees. They are all rather similar and hybrids are frequent. The bark of most species rolls or peels off and it contains a white pigment, betulin. Birches grow rapidly when young and they are short-lived; they may die back and decay rapidly when 60-100 years old. They are pioneer trees, seeding on to open ground and unable to establish in shade." (000-24)

SUB-FAMILY: Betuloideae (118-59)

- 1978 V.H. Heywood, Flowering Plants of the World, pg. 59. "The male flowers are borne in three-flowered groups and have a perianth. The female flowers lack a perianth." (118-59)

TRIBE: Betuleae (118-59)

- 1978 V.H. Heywood, Flowering Plants of the World, pg. 59. "Has two genera, Betula (about 50 species) and Alnus (about 30 species)." (118-59)

GENUS: Betula

- 1976 T. Christopher Brayshaw, Catkin Bearing Plants of British Columbia, B.C. Provincial Museum, No. 18 Occasional Paper Series, pg 136. "Trees and shrubs with thin bark usually marked with conspicuous, horizontally, elongated lenticels, slender twigs with flattened pith, young twig puberulent or glandular (or both), and several-scaled buds, the terminal bud absent. Lateral spur shoots bearing usually 2, sometimes 3, leaves in one season. Epidermal hairs on the twigs are of two kinds, long and loose (1-2 mm), and very short, dense, and puberulous. Staminate catkins pendulous, more or less sessile, with 3 bractletted flowers in the axil of each main bract. Staminate flower with a 2- or 3-lobed calyx and 2 stamens split at the top with a single anther chamber at the tip of each branch. Pistillate catkins pendulous to erect, with 2 or 3 flowers, without sepals, in the axil of each compound bract; the latter usually 3-lobed and formed of a bract and 2 adnate axillary bractlets; the fruit and bract eventually deciduous together from the persistent axis of the catkin. The pistillate flower consists merely of the ovary and a pair of linear stigmas. The fruit is a small samara with the persistent stigmas, and wings forming a border around the central single-seeded "nutlet". (164-136)

- 1976 T. Christopher Brayshaw, Catkin Bearing Plants of British Columbia, B.C. Provincial Museum, No. 18 Occasional Paper Series, pg 136. "A difficult

though not large genus of perhaps 60 species, mostly in northern Asia but with about 10 in Canada. Prolific hybridization has resulted in confusing swarms of hybrids, many of which have been named as species and which tend to blur the distinctions between the real species, whatever they are." (164-136)

- 1976 T. Christopher Brayshaw, Catkin Bearing Plants of British Columbia, B.C. Provincial Museum, No. 18 Occasional Paper Series, pg 136. "HYBRIDS: Many names have been given to hybrids in this genus. For each hybrid population arising from a given combination of parental species, only one of the specific names given is strictly correct. Backcrossing between a hybrid and one of its parent species may give rise to offspring that are classed as varieties of the latter.
The following combinations have been found, involving species in British Columbia:

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "The genus Betula includes some 120 existing species and about 40 more that are now extinct." (403-134)

PLANT CHEMISTRY:

CONSTITUENTS:

- 1931 M. Grieve, A Modern Herbal, pg. 103, (B. alba). "Birch bark only contains about 3 per cent of Tannic acid, but is extensively used for tanning, wherever there are large birch forests, throughout Northern Europe. As it gives a pale colour to the skin, it is used for the preliminary and the final stages of tanning. It contains betulin and betuls camphor. The leaves contain betulorentic acid. By destructive distillation, the white epidermis of the bark yields an empyreumatic oil, known variously in commerce as oil of Birch Tar, Oleum Rusci, Oleum Betulinum or Dagget. This is a thick, bituminous, brownish-black liquid, with a pungent, balsamic odour. It contains a high percentage of methylsalicylate, and also creosol and guaiacol.

The Rectified Oil (Oleum Rusci Rectificatum) is sometimes substituted for oil of cade. Birch Tar oil is almost identical with Wintergreen oil. It is not completely soluble in 95 per cent acetic acid, nor in aniline, but Turpentine oil dissolves it completely." (141-103)

- 1973 Frantisek Stary & Vaclav Jirasek, Herbs, pg. 86. "B. pendula: The parts collected for medicinal purposes are young spring leaves (Folium betulae) while they are still slightly sticky. These are dried in the shade or by artificial heat at temperatures not exceeding 45o C. The drug has a faintly aromatic, disagreeable odour and bitter taste. It contains saponins, some essential oil, resin, tannins and flavones. Young leaves also contain vitamin C. The drug has a diuretic and disinfectant action but does not irritate the kidneys. It also stimulates the sweat glands." (38-86)

- 1973 Frantisek Stary & Vaclav Jirasek, Herbs, pg. 86. "B. pendula: The bark and wood serve for the extraction of a tar containing cresol, traces of phenol and sulphur compounds. It has an anitparasitic action but is mildly irritating to the skin." (38-86)

- 1977 Francesco Bianchini & Francesco Corbetta, Health Plants of the World, pg. 222. "The drug is derived from the bark and leaves. The leaves contain tannin, essential oil and a saponin, and have diuretic properties. Dry distillation of the bark produces the so-called 'birch oil', which is efficacious in the case of certain skin complaints. Birch bark contains a glycoside which decomposes to give methyl salicylate. It is used as a remedy for rheumatism in Canada and the USA." (90-222)

- 1977 Schauenberg & Paris, Guide to Medicinal Plants, pg. 199 [Betula pendula, Roth]. "The young leaves (Fol. Betulae) are rich in saponins; they contain a diuretic flavonoid derivative (hyperoside), sesquiterpenes and tannins. The buds (Gemmae Betulae) contain a volatile oil; the bark contains betulinol, and a glycoside (betuloside)." (439-199)

- 1978 Nancy J. Turner & Adam F. Szczawinski, Wild Coffee and Tea Substitutes

of Canada, pg 49. "..the bark and twigs of the sweet and yellow birches contain an aromatic oil, methyl salicylate, virtually identical to that produced by the small, shrubby wintergreen plant (Gaultheria procumbens)...The compounds are the same except for a minute difference in molecular structure, and are impossible to differentiate without the most sophisticated chemical procedures. In fact, the wintergreen flavouring, so commonly used in candies, chewing gums, toothpastes, and medications, when not artificially produced as is not usual, is more often derived from sweet birch than from the real wintergreen plant." (98-49)

- 1980 David G. Spoerke, Jr., Herbal Medications, pg. 31. "Leaves and shoots [of Betula alba] secrete a resin, which when combined with alkali is said to create a laxative substance. The bark contains 10-14% betulin (a dihydric alcohol). When made into birch bark tar, the tar contains creosol, traces of phenols, creosote, and guaiacol. Betula lenta bark contains significant amounts of methyl salicylate." (135-31)

- 1981 Arnason et al., Use of plants for food and medicine by Native Peoples of eastern Canada, 2311. "Betula lenta L.(Cherry Birch) Gallic acid, chlorogenic acid. Betula lutea Michx. (Yellow Birch) Gallic acid, chlorogenic acid."

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 136. "The white colour (of the bark) is ascribed to the presence of betulin crystals in the outer layers." (403-136)

- 1987 Eleanor G. Viereck, Alaska's Wilderness Medicines, pg. 9. "The Merck Index cites betulin (betula camphor) 10% to 15% in the outer portion of the white bark. Leaves contain betuloresinic acid, essential oil, ether, betuloside, gaultherin, methyl salicylate, and ascorbic acid; in the bark of the sweet birch is salicylic acid." (407-9)

- 1988 Hans Fluck, Medicinal Plants, pg 42. "Constituents and Action: Volatile oil, resin, a saponin, a flavonoid. Used as a diuretic which does not

irritate the kidneys. They have a mild antiseptic action." (438-42)

- 1990 Steven Foster & James A. Duke, A Field Guide To Medicinal Plants, pg 294. "Betula lenta: Essential oil (methyl salicylate) distilled from bark...Essential oil was formerly produced in Appalacia. But now, methyl salicyulate is produced synthetically, using menthol as the precursor." (447-294);

TOXICITY:

- 1978 Nancy J. Turner & Adam F. Szczawinski, Wild Coffee and Tea Substitutes of Canada, pg 47. "Methyl salicylate, or oil of wintergreen, when taken in excess can be toxic, especially to children. It can cause nausea, vomiting, acidosis, pulmonary edema, pneumonia, convulsions, and death. Doses of 4 to 10 ml in children and 30 ml in adults can be fatal. It is related to aspirin but more toxic. Of course, the small concentration to be found in birch tea is harmless, but children who are hypersensitive to aspirin should not drink the tea or even touch the plants." (98-47)

- 1980 David G. Spoerke, Jr., Herbal Medications, pg. 31. "There does not appear to be enough pharmacologic activity associated with the betulin to make overdose a hazard. One could become poisoned on the methyl salicylate in B.lenta bark, or have significant dermal irritation due to the phenolic components of the birch bark tar." (135-32)

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 64. "Prolonged boiling in closed containers could concentrate the salicylic acid of birch and spark problems with those hypersensitive to aspirin. Steeped gently as a tea, the herb is generally regarded as quite safe." (444-64)

- 1990 Steven Foster & James A. Duke, A Field Guide To Medicinal Plants, pg 294. "WARNING: Essential oil toxic. Easily absorbed through skin. Fatalities reported." (447-294)

FOOD USES OF BIRCH:

- 1919 U.P. Hedrick, Sturtevant's Edible Plants of the World, pg. 95. "Betula alba Linn.: Europe, northern Asia and North America. The bark, reduced to powder, is eaten by the inhabitants of Kamchatka, beaten up with the ova of the sturgeon, and the inner bark is ground into a meal and eaten in Lapland in times of dearth. Church says sawdust of birchwood is boiled, baked and then mixed with flour to form bread in Sweden and Norway. In Alaska, says Dall, the soft new wood is cut fine and mingled with tobacco by the economical Indian. From the sap, a wine is made in Derbyshire, England, and, in 1814, the Russian soldiers near Hamburg intoxicated themselves with this fermented sap. The leaves are used in northern Europe as a substitute for tea, and the Indians of Maine make from the leaves of the American variety a tea which is relished. At certain seasons, the sap contains sugar. In Maine, the sap is sometimes collected in the spring and made into vinegar." (394-95)

- 1977 Lee Allen Peterson, Edible Wild Plants, pg 200. "The sap of all birches, Betula spp., is edible. Spring (sap, inner bark); all year (twigs)." (418-200)

- 1979 Barrie Kavasch, Native Harvests, pg. 24. "Natural Sugars can be derived from the sap of several other native trees, much the same as the Indians refined them from the maples. In the early spring the three major species of birches were tapped: Black Birch, Cherry Birch or Sweet Birch (Betula lenta), Yellow Birch (B. lutea), and White Birch (B. papyrifera). A number of beverages, liquors, vinegars, syrups, and sugars are easily rendered from these trees." (157-24)

NATIVE FOOD USES:

- 1609 Marc Lescarbot, Nova Francia, a description of Acadia 1606, 301. "As for the trees of the forests, the most common in Port Royal be...birch (very good for joiner's work)...247. If they be pressed with thirst, they have the skill to suck the trees, from whence do trickle down a sweet and very pleasant

liquor, as I myself have tried it sometimes." (369-38)

- 1624 Father Theodat Gabriel Sagard, Le gran voyage du pays des Hurons, situe en l'Amerique vers mer douche, es dernier confines de l a Nouvelle Franch, dite Canada, Published in translation by the Champlain Soc. XXV 1939 ed. Wrong. fac. ed. 1968 Greenwood, N.Y. 99. "If they have an urgent thirst and no water they know how to suck it from birch trees." (369-38)
- 1823 Sir John Franklin, Narrative of a Journey to the Shores of the Polar Sea in the Years 1819, 20, 21, and 22. London: John Murray. "The Hudson's Bay Company's people whom we passed on the 23rd, going to the rock house with their furs, were badly provided with food, of which we saw distressing proofs at every portage behind them. They had stripped the birch trees of their rind to procure the soft pulpy vessels in contact with the wood, which are sweet, but very insufficient to satisfy a craving appetite." (305-42)

- 1932 Osgood, Cornelius B., The Ethnography of the Great Bear Lake Indian, National Museum of Canada Bulletin 70. Ottawa. 31-97. "Indians like to chew spruce gum, and the Kutchin tap birch trees, catching the sap in small baskets. This birch syrup is eaten in its natural form or boiled. They sometimes chew the under bark of the spruce tree." (305-2)

- 1977 Berndt Berglund & Clare E. Bolsby, The Complete Outdoorsman's Guide To Edible Wild Plants, pg. 163. "Historically, Huron Indians often used the bark or the young twigs both as a stimulant tea and as a food seasoning, as observed by the French explorer, Samuel de Champlain in 1615, during his stay with the Hurons. He found that the women often used black birch bark to improve the taste of their food, which indeed it did." (168-163)

- 1981 Arnason et al., Use of plants for food and medicine by Native Peoples of eastern Canada, 2206. "Algonquin [Betula lutea Michx. f.] Sap mixed with maple sap for sugar making (Black 1980); Montagnais [Betula papyrifera Marsh] Inner bark grated and eaten (Speck 1917); Cree [Betula papyrifera Marsh] Sap used for syrup (Black 1980)." (435-2206)...."Iroquois [Betula lenta L.] Twigs made into a small bundle and steeped, sap drunk (Waugh 1916); Ojibwa [Betula

lutea Michx. f.] Sap added to maple sap for a cold beverage (Smith 1932); Micmac [B. lutea] Twigs used for tea (Lacey 1977); Malecite [B. lutea] Bark tea (Speck & Dexter 1952)." (435-2230)

EUROPEAN FOOD USES:

- 1919 U.P. Hedrick, Sturtevant's Edible Plants of the World, pg. 95. "Betula lenta Linn.: The sap, in Maine, is occasionally converted into vinegar." (394-95)..."Betula nigra Linn.: From Massachusetts to Virginia. The sap contains sugar in the spring, according to Henfrey (Henfrey, A., Bot. 356. 1870)." (394-95)

- 1977 Lee Peterson, A Field Guide To Edible Wild Plants of Eastern and Central North America, pg. 200. "Syrup, sugar, water, flour, tea. Birch sap flows abundantly and can be processed like maple sap to make a sweet, molassseslike syrup; the flow is usually best in late March or April. The inner bark can be dried and ground into flour for emergency use. The twigs can be steeped in hot water to make tea. NOTE: The sap of all birches, Betula spp., is edible." (269-200)

- 1977 Berndt Berglund & Clare E. Bolsby, The Complete Outdoorsman's Guide To Edible Wild Plants, pg. 165. "Put a small handful of twigs or some bark in a piece of cloth and tie it securely. When boiling meat, add the spice-bag. It will improve the flavor." (168-165)

- 1979 Nelson Coon, Using Plants For Healing, pg. 76 [Betula lenta]. "..the oil [of Betula lenta] thus extracted is practically indistinguishable from oil of wintergreen and is much used for the purpose, the sweet sap of the birch trees was collected as a source of sweetening, and was used as a basis for a fermented beer." (134-76)

BIRCH BARK FLOUR:

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. lenta). "The cambium, or the

layer between the wood and the bast, is eaten in the spring, cut into strips like vermicelli..." (141-104)

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 122. "For emergency food the inner bark is pounded to yield a flour, and syrup can be made from the sap, which itself is a pleasant cooling drink." (71-126)

- 1980 Bradford Angier, Feasting Free on Wild Edibles, pg. 159. "The inner bark, dried and then ground into flour, has often been used by Indians and frontiersmen for bread. It is also cut into strips and boiled like noodles in stews. But you don't need to go even to that much trouble. Just eat it raw." (204-159)

- 1984 Marilyn Walker, Harvesting The Northern Wild, pg. 41. "The inner bark of white birch can be ground into a flour and used as an emergency bread-stuff." (305-41)

BIRCH BEER:

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 122. "Birch beer is made from the sap of sweet birch. Gibson says to tap the tree, put the sap together with a handful of corn in a jug, and let fermentation do the rest!" (71-123)

- 1962 Euell Gibbons, Stalking the Wild Asparagus, pg. 34. "Betula lenta (Sweet Birch): A better-known beverage that can be made from this tree is Birch Beer. Measure 4 quarts of finely cut twigs of sweet birch into a bottom of a 5-gallon crock. In a large kettle, stir 1 gallon of honey into 4 gallons of birch sap and boil this mixture for 10 minutes, then pour over the chopped twigs and return the liquid to the crock. Spread 1 cake of soft yeast on a slice of toasted rye bread and float this on top of the beer. Cover with a cloth and let it ferment until the cloudiness just starts to settle. This will usually take about a week, but it depends somewhat on the temperature.

Bottle the beer and cap it tightly. Store in a dark place, and serve it ice cold before meals after the weather gets hot. It has a reputation for stimulating the appetite. More than a glass or two at a time is likely to stimulate other things, for this beer has a kick like a mule. This is one birch beverage that is definitely not suitable for children." (2-34)

- 1973 Eliot Wigginton, Foxfire 2, pg. 53. "Tap trees when sap is rising. Jug sap and throw in a handful of shelled corn. Nature finishes the job." (228-53)

- 1973 Alan Hall, The Wild Food Trailguide, pg. 61. "All three Birches [B. lenta, B. lutea, B. papyrifera] are copious producers of sap. This is tapped in the same way as Maples but it reaches its peak later, usually in April. The sap can be used as a beverage as it comes from the tree or boiled down to a syrup or sugar. While Birch sap contains only about half the sugar of Maple sap, it flows much faster. Birch Beer can be made by combining sap with sugar or honey, boiling for about an hour, cooling, and adding yeast. Another method is to steep young twigs of the Sweet Birches in boiling water, add sugar (3 pounds to 5 gallons of liquid), cool, and add yeast. Sap can be made into vinegar by adding yeast. Young twigs and fresh or dried inner bark of Sweet Birches can be used to make wintergreen tea." (79-61)

- 1982 Thomas S. Ellis & Peter A. Dykeman, Field Guide To North American Edible Wild Plants, pg 125. "Sweet Birch or Black Birch (Betula lenta): For birch beer, pour solutions of 4 gal birch sap and 1 gal honey (or 5 gal sap and 3 lb sugar), which has been boiled 10 minutes, over 4 quart fine twigs in crock. Cool, strain to remove twigs, add 1 cake of yeast. Cover; ferment about 1 week, until cloudiness starts to settle. Bottle and cap tightly." (279-125)

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 63. "Alaskan homesteader Yule Kilcher allows sap to stand uncovered until fermentation occurs; he then filters the sap, adds a pinch of sugar and yeast, corks and ages the brew, and serves it as "birch champagne." (444-63)

BIRCH SAP:

- 1939 Oliver P. Medsger, Edible Wild Plants, pg 204. "The sap of the Black Birch (B. lenta) may be used for making sugar. It is only about half as sweet as that obtained from the Sugar Maple. It flows freely in April, or about a month later than that of maple trees." (7-205)

- 1982 Thomas S. Ellis & Peter A. Dykeman, Field Guide To North American Edible Wild Plants, pg 122. "Yellow Birch (B. lutea): Boil sap in shallow open container outdoors, adding more as volume decreases, until evaporation leaves viscous, molasses-flavored syrup with temperature about 104o C (220o F). Ratio of sap to ultimate syrup is far greater than for sugar maple. Store in sterilized, filled, sealed jars." (279-122)

- 1983 Tom Brown Jr., Tom Brown's Field Guide To Wilderness Survival, pg. 54. "Since water gathered by this method [Tapping] contains a high concentration of sugar, drinking large amounts of it (say, more than a pint or two a day) can cause an upset stomach or cramps. For the same reason, the liquid tends to spoil when it's not drunk soon. Personally, I like to use it to brew a presweetened herbal tea. In a pinch, you can get pure water by evaporating the liquid inside a solar still." (270-54)

- 1984 Marilyn Walker, Harvesting The Northern Wild, pg. 41. "Sap tapped from the tree is slightly sweet and can be used just as it is; or, it can be boiled down to make a syrup similar to that made from maple trees in regions farther south. The sap runs for two weeks or so at a time of year when the nights are freezing, but the days warm. At the beginning of the running, the sap will be clear; at the end it turns milky and bitter. This is the sign that the season is over. The amount of sap produced varies considerably from tree to tree and from year to year, so it is best to tap several trees at once." (305-41)

- 1984 Marilyn Walker, Harvesting The Northern Wild, pg. 41. "To collect birch sap, drill a hole in the tree about 5 cm (2 in) deep and 60 to 90 (2 to 3 ft)

from the ground. Make a spout from a piece of metal (such as a clean and rust-free tin can) and put this into the hole; then hang a bucket below the spout to catch the dripping sap. Boil down on a stove, or outdoors over a wood fire, being careful not to burn the sap. You have to start out with quite a large amount of sap: it must be reduced by about 35 times its volume to make a thick syrup! Thats almost twice as much boiling as needed to make maple syrup, and the resulting birch syrup will still be thinner than maple syrup. In Russia and some northern European countries, the sap is fermented to make wine and vinegar. It can also be used to make birch beer." (305-41, 407-11)

GUMS:

- 1979 Barrie Kavasch, Native Harvests, pg. 24. "Black Birch bark (Betula lenta) was carefully peeled, and small pieces were enjoyed raw or boiled for several minutes and then chewed. This gum provides refreshing and beneficial juices." (157-168)

LIQUEURS:

- 1862 Bernard R. Ross, An Account of the Botanical and Mineral products, Useful to the Chipewyan Tribes of Indians, Inhabiting the McKenzie River District. Canadian Naturalist and Geologist 7. 133-137. "The Canoe or Paper Birch (Betula papyracea)...In spring, the sap forms a pleasant drink from which a syrup can be manufactured by boiling, and which may be further transformed, by fermentation, into an agreeably flavoured wine of considerable potency." (305-42)

- 1931 M. Grieve, A Modern Herbal, pg. 103, (B. alba). "When the stem of the tree is wounded, a saccharine juice flows out which is susceptible, with yeast, of vinous fermentation. A beer, wine, spirit and vinegar are prepared from it in some parts of Europe. Birch Wine, concocted from this thin, sugary sap of the tree, collected from this thin, sugary sap of the trees in March, honey, cloves and lemon peel being added and then the whole fermented with

yeast, makes a very pleasant cordial, formerly much appreciated. From 16 to 18 gallons of sap may be drawn from one large tree, and a moderate tapping does no harm." (141-103)

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. lenta). "The liquor is used in Kamschatka without previous fermentation." (141-104)

- 1984 Marilyn Walker, Harvesting The Northern Wild, pg. 41. "In Russia and some northern European countries, the sap is fermented to make wine and vinegar. It can also be used to make birch beer." (305-41)

TEAS:

- 1914 H. Cody, On Trail and Rapid by Dog-sled and Canoe: The Story of Bishop Bompas' life Amongst the Red Indians and Eskimo, Told for Boys and Girls. London: Seeley, Service and Co. Ltd. 171. "Raspberry shoots, birch-buds, and some other berry-trees are also at times used to make tea in the absence of the genuine article, but they are rather medicinal." (305-41)

- 1939 Oliver P. Medsger, Edible Wild Plants, pg 204. "The black Birch (B. lenta) makes a most delightful tea, the same in taste as that of Mountain Tea or Wintergreen. For this purpose, the rapidly growing young twigs are generally used. The thick inner bark from the trunk is good, but to remove it injures and disfigures the tree....This bark is almost red, easily separates from the wood in the spring and early summer, and is strongly flavored. It may be dried and kept for months without losing much of its spicy taste. Sugar and cream added to the tea is preferred by most people." (7-204)

- 1939 Oliver P. Medsger, Edible Wild Plants, pg 205. "In Maine the Indians make a tea from the leaves of the Paper or Canoe Birch, Betula papyrifera, as recorded by Henry D. Thoreau in the The Maine Woods, and seem to greatly relish it." (7-205)

- 1962 Euell Gibbons, Stalking the Wild Asparagus, pg. 33. "Betula lenta

(Sweet Birch): To make a wintergreen-flavored tea, cut some sweet birch twigs in small pieces and cover them with boiling birch sap. Let it steep for a minute or two, then strain out the twigs and sweeten the tea to taste. Some like to add cream or hot milk." (2-33)

- 1962 Euell Gibbons, Stalking the Wild Asparagus, pg. 33. "Betula lenta (Sweet Birch): Birch Tea can also be made of the red, inner bark of sweet birches, but removing this bark from standing timber disfigures and injures the trees....The bark from the stumps and roots is considered the best. Use a knife or a carpenter's wood scraper to remove the outer, dry layer and then peel off the red inner bark. It peels best in spring or early summer. If this is cut in small pieces and dried at ordinary room temperature, then sealed in fruit jars, one can have the makings of Birch Tea throughout the year. Use boiling water when birch sap is not available. Never boil the twigs or bark in making this tea and never dry the bark in too warm a place, for the wintergreen flavor is very volatile, and is easily driven off by too much heat." (2-34)

- 1977 Berndt Berglund & Clare E. Bolsby, The Complete Outdoorsman's Guide To Edible Wild Plants, pg. 163. "BLACK BIRCH TEA: Cut a strip of bark from a young tree, or use twigs cut into small pieces. Immerse in water and bring to a boil. Remove from the heat and cool on the side of the stove, letting the mixture stand and brew for at least 30 minutes. Reheat, strain, and serve as a stimulating tea." (168-163)

- 1979 Barrie Kavasch, Native Harvests, pg. 24. "Cherry Birch, Sweet Birch (Betula lenta). The Twigs and bark are a primary source of oil of wintergreen. A pleasing, golden woodland tea is derived by steeping fresh (or dried) bark chips and twigs in enough boiling water to cover for 15 minutes in a covered pot or cup." (157-131)

- 1980 Bradford Angier, Feasting Free on Wild Edibles, pg. 157. "This latter reddish bark [of Black Birch] easily stripped off in the spring and early summer, can be dried at room temperatures and stored in sealed jars in a cool

place for later use. A teaspoon to a cup of boiling water, set off the heat and allowed to steep for 5 minutes, makes a tea that is delicately spicy. Milk and sugar make it even better." (204-158)

- 1982 Thomas S. Ellis & Peter A. Dykeman, Field Guide To North American Edible Wild Plants, pg 125. "Sweet Birch or Black Birch (Betula lenta): For tea, steep (do not boil) twigs or fresh or dried inner bark in water or, preferably, birch sap. Boiling destroys volatile wintergreen oil." (279-125)

- 1984 Marilyn Walker, Harvesting The Northern Wild, pg. 40. "The white papery bark of some species makes a pleasant tea with a faint caramel odour. To try this, first peel off thin outer strips of bark from a tree, and rinse them to remove dust and flaked bark. Using about a handful per person, pour boiling water over the bark and steep for 3 to 5 minutes." (305-40)

SALID MATERIAL:

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 63. "For spring salads, add young birch leaves and catkins (from any species) with other milder greens and toss with your favorite dressing. Birch buds and twigs, gathered from the small or tall birches, can be tied in a muslin bag and boiled in vegetable and meat stews as a spice." (444-63)

WINTERGREEN OIL:

- 1939 Oliver P. Medsger, Edible Wild Plants, pg 204. "Large quantities of the oil of wintergreen are distilled from the twigs and bark of the Black Birch. The essence is exactly the same as that produced from the true Wintergreen (Gaultheria)." (7-204)

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 122. "Sweet birch (B.lenta) and Yellow birch (B.lutea) are the only birches from which oil of wintergreen can be obtained by distilling the twigs and inner bark. Of the two, sweet birch will yield by far the most, so

that yellow birch is probably not treated for this purpose." (71-122)

- 1958 H.E. Jaques, The Economic Plants, pg 140. "The twigs and leaves when boiled and distilled yield oil of wintergreen, much used in food flavoring and also in medicine. Much of the oil of wintergreen now in use is made synthetically." (169-140)

MEDICINAL USES OF BIRCH:

MODE OF ACTION:

- 1970 Virgil J. Vogel, American Indian Medicine, pg. 181. "Sweet-birch oil was official in the USP, 1894-1916, and remains one of the officially recognized forms of methyl salicylate, in the USP since 1894. It is obtained by distillation from the twigs and bark of B. lenta L., (Black birch), an indigenous species, reported to be stimulant, diuretic, and astringent. Rectified birch-tar oil, listed in the National Formulary, 1916-55, was distilled from the dry bark of foreign species, and used externally as a counterirritant, parasiticide, and antiseptic in skin diseases." (146-281)

- 1977 Schauenberg & Paris, Guide to Medicinal Plants, pg. 199 [Betula pendula, Roth]. "The leaves are diuretic and help the heart; the buds are choleritic. The birch is used in various ways (infusion, oil, extract) to treat disorders of the urinary tract; in herbalism to treat some skin complaints...To treat urinary insufficiencies, dropsy, rheumatism and infections of the urinary tracts. Parts used: The young leaves." (439-199)

- 1980 David G. Spoerke, Jr., Herbal Medications, pg. 31. "The methyl salicylate of B.lenta may be used as a counterirritant in treating rheumatism. It also has some analgesic properties. The betulin has unknown pharmacologic properties. (135-31)

- 1986 Reader's Digest, Magic and Medicine of Plants, pg 104. "Black birch

bark has astringent properties, which account for its effectiveness in treating wounds, and it contains methyl salicylate, which explains its usefulness as a pain reliever. When applied externally, the oil is an excellent counter-irritant to alleviate the pain of sore muscles." (372-104)

- 1990 Steven Foster & James A. Duke, A Field Guide To Medicinal Plants, pg 294. "Betula lenta: Essential oil (methyl salicylate) distilled from bark was used for rheumatism, gout, scrofula, bladder infection, neuralgia; anti-inflammatory, analgesic. To alleviate pain or sore muscles, the oil has been applied as a counterirritant." (447-294);

NATIVE MEDICINAL USES:

- 1634 HURON, 1610-1791 Travel and explorations of the Jesuit Missionaries in New France, vol. 7; 129. [B.p.] "Up to the present I have observed three natural remedies among the savages...the third of these medicines is composed of the scrapings of the inside bark of the birch, at least it seems to be this tree. They boil these scrapings in water, which they afterwards drink to make them vomit."

- 1672 John Josselyn, New England Rarities Discovered, In Archaeologica Americana, Transactions and Collections of the American Antiquarian Society. Boston, 1860, Vol. IV, 185. "The bark of birch is used by the Indians for bruised wounds and cuts, boyled very tender, and stamped betwixt two stones to a plaister, and the decoction therof poured into the wound; and also to fetch the fire out of burns and scalds." (146-280)

- 1828 Dr. Jonas Rishel, The Indian Physician, pg 6. [Black Birch: Betula lenta]. "Virtues: It is both stimulating and strengthening. It is good in all syrups and decoctions, and is useful to remove cold swellings. For this purpose, several thicknesses of flannel should be bound round the part affected, and kept constantly wet with a strong decoction of the bark." (440-7)

- 1928 Frances Densmore, Uses of Plants by the Chippewa Indians, pg. 364. "Enemas..B. papyrifera Marsh (White Birch)...Inner Bark...Steeped. (211-364)

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 123. "Josselyn wrote of the inner bark of black birch and white birch, "the bark is used by the Indians for bruised wounds and cuts, boyled very tender and stampt betwixt two stones to a plaister, and the decoction thereof poured into the wound; and also to fetch Fire out of burns and scalds." (71-123)

- 1970 Virgil J. Vogel, American Indian Medicine, pg. 95. "The properties of birch oil, an officially recognized source of methyl salicylate, were known to the Indians. All writers on the materia medica of the northern tribes mention the use of various parts of this tree by the Indians, and we have an interesting anecdote from the diary of J.W. Phelps, an army officer stationed at Mackinac in 1840-41. While exploring an island with a group which included the Ojibwa wife of Henry R. Schoolcraft, he related that Mrs. Schoolcraft "stripped off the bark from a birch tree and scraped from the trunk a milky substance which is said to be a good remedy for consumptives." (146-96)

- 1970 Virgil J. Vogel, American Indian Medicine, pg. 95. "Throughout their natural range, birch trees were widely used as medicine by American Indians. A decoction of the inner bark of "Mountain birch," Hunter reported, was used by Indians west of the Mississippi as a remedy in coughs, colds, and pulmonary ailments. Many of the frontier settlers, he observed, valued highly as a table beverage. Hoffman reported that the Ojibwas mixed the inner bark of "Yellow birch" (which he called B. excelsa Ait.) and mixed it with that of sugar maple for a diuretic decoction, a usage considered rational and efficacious by Dr. Edmund Andrews. Smith reported that the Ojibwas used the root of paper birch (B. alba L., var. papyrifera) in medicine as a seasoner to disguise unpleasant tastes; it was also cooked with maple sugar to make a syrup for stomach cramps. The cones of low birch (B. pumila) were heated over coals by the Pillagers to make an incense for catarrh patients. A tea was made from them for women in menses and as a post-parturition tonic. The

Potawatomis used the twigs of yellow birch (B. lutea Michx.) and paper birch for an oil extract used as a medicinal seasoner. Paper-birch bark has also been reported used by the Ojibwas in a medicinal enema. Bark of paper birch and balsam fir was grated and eaten by the Montagnais as beneficial to diet. The Catawbas, Speck reported, boiled the buds of B. nigra L., to a syrup and added sulphur to make a salve for ringworm and sores. The Alabamas of Texas boiled the bark of the same tree for a remedy used in treating sore hooves in horses. The Creeks used white birch as a tuberculosis remedy." (146-281)

- 1980 Michael A. Weiner, Earth Medicine, Earth Food, pg. 117. "Red Birch (Betula nigra): The Catawba Indians prepared a salve of red birch by boiling the buds of this tree until they were thick and pasty and then adding sulphur. This salve was applied externally to skin sores and ringworm." (147-117)

- 1981 Arnason et al., Use of plants for food and medicine by Native Peoples of eastern Canada, 2259. "Ojibwa (Chippewa) [B. lenta L.] Pneumonea, diarrhea: bark decoction; pulmonary trouble: bark with beech bark and red-oiser dogwood (Gilmore 1933); Algonquin [B. lenta L.] General medicine: tea (Black 1980); Cree [B. lenta L] Consumption, lung disease: bark infusion used with hemlock; gonorrhoea: buds used (Strath 1903); Ojibwa [B. lutea Michx. f.] Diuretic: inner bark with bark of sugar maple (Hoffman 1891); Maritime [B. lutea Michx. F.] Hot-water bottle: wood (Chandler et al.1979); Abitibi [B. lutea] Dysentery: bark infusion (Jenkins 1939); Micmac [B. lutea] Diarrhea: tea from bark (Lacey 1977); Ojibwa [B. papyrifera Marsh] Enema: inner bark steeped (Densmore 1974); Ojibwa [Stomach cramps: cook root bark, take with maple sugar (Smith 1932); Algonquin [B. papyrifera] Diaper rash, skin rash: white powder from bark (Black 1980); Cree [B. papyrifera] Chapped skin: boil wood in Labrador tea, dry rub into powder (Holmes 1884); Cree [B. papyrifera] Gonorrhoea: buds used; lung trouble: bark infusion used with hemlock (Strath 1903); Maritime [B. populifolia Marsh] emetic: inner bark (Chandler et al.); Malecite [B. populifolia Marsh] Infected cut: inner bark (Mechling 1959); Ojibwa [B. pumila L. var glandulifera Regel] Catarrh, inflamed nasal passages: incense from cones; menstruation, after childbirth: tea from cones (Smith 1932)." (435-2259) "Iroquois [B. populifolia Marsh] Bleeding piles (Herrick

1977)." (435-2313)

- 1982 Howard H. Hirschhorn, The Home Herbal Doctor, pg.118. "Young crushed leaves applied to wounds and insect bites and stings." (278-118)

- 1990 Steven Foster & James A. Duke, A Field Guide To Medicinal Plants, pg 294. "Betula lenta: Our most fragrant birch was widely used by American Indians, in bark tea for fevers, stomachaches, lung ailments; twig tea for fever." (447-294)

EUROPEAN MEDICINAL USES:

- 1642 Nicholas Culpeper, Culpeper's Complete Herbal, pg. 50. "Description: This groweth a goodly tall straight tree, fraught with many boughs and slender branches bending downward; the old being covered with a discoloured chopped bark, and the younger being browner by much. The leaves at the first breaking out are crumpled, and afterwards like beech leaves, but smaller and greener, and dented about the edges. It beareth small short catkins, somewhat like those of the hazel-nut tree, which abide on the branches a long time until growing ripe they fall upon the ground, and their seed with them. Place: It usually groweth in woods. Government and Virtues: It is a tree of Venus. The juice of the leaves, while they are young, or the distilled water of them, or the water that comes from the tree being bored with an auger, and distilled afterwards; any of these being drunk for some days together, is available to break the stone in the kidneys and bladder, and is good also to wash sore mouths." (144-50)

- 1672 John Josselyn, New England Rarities. Birch bark was boiled and pounded into a poultice and applied to wounds and cuts. The exudation of birth gum was used as 'touch wood' for the treatment of sciatica, an all too common colonial complaint. [See elder for its uses by the Indians to burn their skin, the pain of this burn being worse than that of the sciatica, it was relieved]. (369-39)

- 1735 John K'Eogh, Botanalogia Universalis Hibernica, [An Irish Herbal, 1986], pg 30. "The liquid that is drained off this tree in the springtime is good for dispelling urinary disorders, like stones, pains and bleeding. A decoction of the leaves, when drunk, is considered good for scurvy." (412-30)
- 1737 John Brickell, The Natural History of North-Carolina, With an Account of the Trade, Manners, and Customns of the Christian and Indian Inhabitants. Dublin, James Carson, 1737. pg. 72. (Reprint, ed. by J. Bryan Grimes, by authority of the Trustees of Public Libraries, Raleigh, 1911) "[Birch leaves]..are cleansing, disolve and purge watry Humours, help Dropsies and Stone in the Bladder, the Ashes of the Bark is effectual to heal sore Mouths, and take away Scabs." (146-280)

- 1828 Dr. Jonas Rishel, The Indian Physician, pg.6, (Betula lenta L.). "Description: The bark of this tree resembles that of black cherry: the leaves resemble those of yellow birch: its flavour is like that of winter-green somewhat stimulating and aromatick. Place: It generally grows in the coldest parts of this country; on the sides of hills, mountains, &c. Virtues: It is both stimulating and strengthening. It is good in all syrups and decoctions, and is useful to remove cold swellings. For this purpose, several thicknesses of flannel should be bound round the part affected, and kept constantly wet with a strong decoction of the bark." (-6)

- 1931 M. Grieve, A Modern Herbal, pg. 104. (Betula alba L.) "Various parts of the tree have been applied to medicinal uses. The young shoots & leaves secrete a resinous substanbe having acid properties, which, combined with alkalies, is said to be a tonic laxative. The leaves have a peculiar, aromatic, afreeable odour and a bitter tarte, and have been employed in the form nf infusion (Birch Tea) in gout, rheumatism and dropsy, and recommended as a reliable solvent of stone in the kidneys. With the bark they resolve and resist putrefaction. A decoction of them is good for bathing skin affections, and is serviceable in dropsy. The oil is astringent, and is mainly employed for its curative effects in skin affections, especially eczema, but is also used for some internal maladies. The inner bark is bitter and astringent, and has been used in intermittent fevers. The vernal sap is diuretic. Moxa is

made from the yellow, fungous excrescences of the wood, which sometimes swell out from the fissures. Dosage: Of alcoholic extract of the leaves, 25 to 30 grains daily." (141-104).

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. lenta). "..the bark is stimulant, diaphoretic, and astringent, in a warm infusion. In decoction or syrup it forms an excellent tonic for dysentery, and is said to be useful in gravel and female obstructions." (141-104)

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. nana). "Smooth Dwarf Birch, rarely grows above 3 feet in height. Moxa is prepared from it and regarded as an effective remedy in all painful diseases." (141-104)

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 123. "As a tonic, Seton suggests boiling 2 lb. of twigs to a gallon of water, until a pint of strong brown tea is left, which can be sipped a half pint a day. Birch tea is best made, however, by steeping, not boiling, the twigs. Boiling tends to drive off the wintergreen oil." (71-123)

- 1970 Joseph M. Kadans, Modern Encyclopedia of Herbs, pg. 59. "Betula alba (European Birch): This herb increases the tone of the gastro-intestinal mucous membrane and is therefore known as a bitter. By contracting tissue and arresting discharge of fluids, it is also an astringent. An ounce of the dried leaves may be steeped in hot water to produce a pint of solution that may be taken several times a day for the stomach and intestines. The bark of this tree yields a tar, from which is derived a volatile oil by distillation, known as Oleum Rusci or Oleum betulinum. This oil has been used internally for the treatment of gonorrhea but is more widely known as a remedy for skin diseases, especially those of the type known ass eczema where there is itching, redness or infiltration, a condition where the skin contains deposits of diseased fluid." (250-59)

- 1970 Virgil J. Vogel, American Indian Medicine, pg. 181. "Samuel Stearns called the "juice" of Betula alba (White Birch) antiscorbutic, deobstruent,

diuretic, and laxative; the leaves and bark resolvent, detergent, and antiseptic. The leaves and bark applied externally, he claimed, "are said to resolve hard tumours, cleanse foul ulcers, and resist putrefaction." Moreover, "the fumigations of the bark have been employed for correcting contagious air." When Dr. Clapp compiled his "Report on Medical Botany" (1852), the B. nigra L. (Red Birch) and B. lenta L., (Cherry or Sweet Birch) were listed in the United States Dispensatory. The bark and small twigs were sometimes used in infusion as an aromatic diaphoretic. On distillation they yielded an oil identical to that of wintergreen." (146-281)

- 1972 Don & Nancy Jason, Some Useful Wild Plants, pg. 150. "Birch buds and leaves can be used as a salve for arthritis and rheumatism; methyl salicylate is the active ingredient. A strong bark decoction removes gravel stones from the kidneys and a milder solution is good for sore throat. Sap or juice from the young leaves is effective in treating external skin irritations and scurvy." (12-150)

- 1972 Jeanne Rose, Herbs & Things, pg. 44. "Commercial birch oil is marketed as oil of wintergreen and used as an astringent, in antiseptic ointments for skin diseases, and as a counterirritant for sore and stiff muscles and joints. Some mix this oil with other aromatic oils and use the combination as an insect repellent (spread over the body). A decoction of the leaves is used as a diuretic, is said to break kidney stones, and is gargled for sore mouths and canker sores. The dose is one teaspoon to a cup of boiling water. Birch leaf is also important as a gentle sedative. Drunk at night it encourages quiet, peaceful sleep with no druglike hangover." (314-44)

- 1973 Alma R. Hutchens, Indian Herbalogy of North America, pg. 38. "Externally: Drink the tea freely when troubled with boils or skin eruptions. The oil of birch is applied to the skin for eczema and cutaneous diseases; the tea is an effective when gargled for canker and mouth sores." (215-38)

- 1973 Frantisek Stary & Vaclav Jirasek, Herbs, pg. 86. "B. pendula: It [the drug from the leaves] is used internally as an infusion in diseases where the

treatment requires increased excretion of urine to rid the body of harmful substances, such as diseases of the kidneys and the urinary organs, rheumatism, gout and dropsy. The drug is therefore often used in urological herbal teas. Externally, it is used as a bath preparation." (38-86)

- 1974 John Lust, The Herb Book, pg. 118, (Betula alba). "Properties and Uses: Astringent, diuretic, diaphoretic. The leaf tea made by infusion is said to eliminate gravel and dissolve kidney stones when taken daily for a time, 1 (one) to 1 1/2 cups a day. It can also be used as a wash or bath additive for skin problems. A decoction of the leaves is sometimes recommended for baldness (or try the expressed juice). If you have trouble sleeping, try the decoction before going to bed as a mild sedative. For chronic or severe skin problems, use a decoction of birch bark as a wash or bath additive. The inner bark contains an oil which is sometimes substituted for wintergreen in liniment. Preparation and Dosage: The leaves must be used fresh. Infusion: Use 1 tbsp. leaves with 1/2 cup hot water. Decoction: Use 1 tbsp. leaves with 1/2 cup water. Boil briefly, let stand for 2 hours, then add 1/2 tsp. bicarbonate of soda. Take up to 1 cup a day. Expressed Juice: Take 1 tsp. at a time, as required." (195-118)

- 1974 John Lust, The Herb Book, pg. 118, (Betula lenta). "Properties and Uses: Anthelmintic, astringent, diuretic. Use leaf for urinary problems and to expel intestinal worms. A tea made from the inner bark makes a good mouthwash, and taken internally is good for diarrhea, rheumatism, and boils. An oil similar to wintergreen can be distilled from the inner bark and twigs. Preparation and Dosage: Decoction: Use 1 tsp. inner bark or leaves with 1 cup of water. Take 1 to 2 cups a day. Tincture: A dose is 1/4 to 1/2 tsp." (195-118)

- 1975 Dr. J. Triska, The Hamlyn Encyclopedia of Plants, pg. 276. "Betula pendula Roth (Silver Birch): Birch Tar Oil is obtained from the white bark and is used for the preparation of Russian leather to which it gives its characteristic smell. It is also a fungal and insect repellant." (119-276)

- 1979 Nelson Coon, Using Plants For Healing, pg. 76 [Betula lenta]. "Oil of Sweet Birch is produced commercially, the supply coming from Connecticut and Tennessee, according to Youngken's Textbook. He says that "the bark and twigs are gathered from the trees from May to late September, chopped or ground and placed in retorts with water which are kept warm overnight by a low fire beneath them. The following day the oil is distilled...Methyl salicylate, the active principle constituting oil of sweet birch...is formed" in the process. Thus is produced an aromatic flavoring agent and an antirheumatic. Salicylic acid is a major ingredient of aspirin, and one supposes that the action of birch oil in rheumatism is much the same as aspirin, which is so often prescribed." (134-76)

- 1979 Malcolm Stuart, The Encyclopedia of Herbs & Herbalism, pg. 163. "Betula pendula Roth (Silver Birch): Uses (dried young leaves) Diuretic, with mild antiseptic action, thus used in urinary tract infections. Formerly used for gout and rheumatism." (272-162)

- 1980 David G. Spoerke, Jr., Herbal Medications, pg. 31. "Alleged Uses: The leaves [of Betula alba] have an agreeable, aromatic odor and have been used as an infusion for rheumatism and dropsy. Both the leaves and the bark have a bitter taste. The bark has been used as an astringent, while birch has found use in treatment for various types of skin disorders." (135-31)

- 1983 David Potterton, Culpeper's Color Herbal, pg. 28. "Betula pendula (B. alba): 'The juice of the leaves is good to wash sore mouths.' Astrology: It is a tree of Venus. Medicinal virtues: The juice of the leaves, or the distilled water of them, breaks the stone in the kidneys or bladder, and is good for sore mouths. Modern Uses: The bark and leaves are used in preparations for skin diseases. Distillation of the bark yields Birch Tar Oil, an astringent ingredient of ointments for eczema and psoriasis. Birch tea is an infusion of the leaves. It is bitter tasting but helpful in gout and rheumatic complaints." (398-29)

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "B.

pendula (Silver Birch): The young leaves have been used in folk medicine for their diuretic effect." (403-134).

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 63. "The bark and leaves [of birch] are often used in teas for headache and rheumatic pain; for these purposes, I like blending birch with willow, poplar, and nettle. For a calming tea that eases insomnia, I mix birch with pineapple weed flowers and valerian. Birch leaf infusions are often recommended to those with urinary problems and kidney stones. Herbalists have used decoctions of the astringent bark internally for fevers and diarrhea, and externally for boils, psoriasis, and vaginal douches for troublesome discharges. Add birch buds and leaves to salves for persistent skin afflictions such ringworm. Blend leaves and bark in liniments and massage oils for sore or strained muscles." (444-64)

RUSSIAN MEDICINAL USES:

- 1973 Alma R. Hutchens, Indian Herbalogy of North America, pg. 38. "Belaya Bereza, Birch, is inseparable from the Russian people as it is their most poetic tree. In some way or time of life the Birch will be known to them through their history, literature, poetry, songs, art and fairy tales. They consider it the most attractive and beautiful of all the trees in the world. Besides emotional and spiritual popularity, the use as medicine from time immemorial goes back to the oldest tale of Russian history and their witness of Folk Medicine and Birch. The American Birch has admirable attention in Russian botanical literature and they have a high opinion as to decorative and industrial use.
Folk Medicine: For centuries Fold Medicine has used Birch in many preparations for empirical and therapeutic results, long before clinical achievements and approval in 1834. One of the serious conditions being Cardial Dropsy.
Birch Buds: Gathered and preserved with vodka (Nastoika) for out-of-season use is an invaluable home medication. This is used for Colds, Pain, Rheumatic conditions, Stomach ulcers and pain, Vitality, Blood purifying, Appetiser, Avitaminois, Liver and Gall-bladder, to dissolve stones of Kidney and Bladder and many other individual complaints. Birch Charcoal: Used as an absorbent

in cases of poisoning, gas bloating and indigestion.
Birch Sap: In the spring is prepared as tea and is considered a vitamin treat as a tonic for Anaemia, Gout, Scurvy, Rheumatism, etc.
Externally: Extract of leaves, buds and bark are applied to ulcers, wounds, boils, eczema and all skin conditions of broken and unbroken surfaces; rheumatic pain, swelling, albuminuria. Russian history and life is unthinkable without a steam bath. Bania. Once a week this is the accepted routine. The stout-hearted race prepare a room with leaves placed over the hot rocks which expel the cleansing vapours of moist heat as hot and as long as the person's health will stand, and Russians excel in physical endurance. When perspiration is established, if the leaves were not placed over the rocks a Beresovy Venic, Birch Broom, is used to vigorously thrash the body. They know any trouble will be taken care of, whatever it is, if the person can stand the heat and the thrashing. In our condition we can do something similar, but not as severe. Boil 2-5 lb. of leaves with enough water to cover for 1-2 hr. in a pillow case or cotton cloth, pour this along with enough hot water in the bath tub to reach the waist when seated. Drench the shoulders, neck, back, face and arms with the container for as long as you feel comfortable. In this case your heart will be your doctor; if you feel weak, or relaxed to the point of falling asleep, make yourself get out. This type of herbal bath done once or twice a week for thirty time consecutively will prove most beneficial for internal and external complaints, as the proper function for both will be improved." (215-39)

- 1987 Eleanor G. Viereck, Alaska's Wilderness Medicines, pg. 9. "Birch sap as medicine and spring tonic is bottled and sold in Russia (L. Viereck, personal communication) Kari reports the Tanainas put fresh fresh birch sap on boils and sores. The old way to obtain sap is to peel back the bark and scrape or suck the sap off the wood." (407-11)

CHINESE MEDICINAL USES:

- 1973 Li Shih-chen, Chinese Medicinal Herbs, pg. 68. "Betula alba (Hua-mu, Hua-mu): This is the White Birch tree which grows commonly in the mountains

of Northern China. The bark is used by Chinese saddlers, shoemakers, cutlers, and candle-makers, who turn its tanning or fatty principles to account in their several trades. The bark may also be used for torches. The drug is used in decoction for jaundice and bilious fevers, and the incinerated bark is used as an application in mammary cancer and rodent ulcer. It is also one of the substances used to dye the whiskers, which, developing late in life in the Chinese, are apt to soon turn grey or reddish-brown." (343-68)

- 1977 Francesco Bianchini & Francesco Corbetta, Health Plants of the World, pg. 160. "The Birch (Betula alba)...the Chinese use a decoction of the bark for jaundice and bilious fever, and as a tonic for the middle-aged and elderly." (90-160)

INDIAN (AYURVEDIC) USES:

- 1986 Dr. Vasant Lad & David Frawley, The Yoga of Herbs: An Ayurvedic Guide to Herbal Medicine, pg. 194. "Betula alba (White Birch): TASTE: bitter, pungent. ENERGY: Cooling. PD-EFFECT: Pungent. DOSHA: PK-V+. ACTIONS: Diaphoretic, diuretic, astringent." (396-194)

PREPARATION & DOSAGES:

- 1973 Alma R. Hutchens, Indian Herbalogy of North America, pg. 38. "A teaspoonful of the leaves and/or bark infused in 1 cup of boiling water for 15 minutes, 3-5 cups daily; mixes well with other herbal teas." (215-38)

- 1979 Joseph E. Meyer, The Herbalist, pg. 15. "Betula lenta (Sweet Birch): One teaspoonful of bark or leaves to a cup of boiling water. Drink 1 or 2 cups a day. Tincture, 1/4 to 1/2 fl. dr." (124-15)

- 1979 Nelson Coon, Using Plants For Healing, pg. 76 [Betula lenta]. "In home use the dried bark or leaves have been used as an excitant, diaphoretic, astringent, antiseptic, carminative, and antipyretic. An infusion may be made at the rate of 1 teaspoonful to 1 cup of boiling water." (134-76)

- 1988 Hans Fluck, Medicinal Plants, pg.42. (Betula pendula Roth). "Usage: Internally as a tisane (pour 1 litre [1.75 pt] of boiling water on 1-2 tablespoonfuls of chopped leaves and allow to stand - the addition of 1 gm (0.04 oz) of bicarbonate of soda increases the efficacy of the tisane) for all forms of urinary insufficiency, especially for dropsy. Also used for rheumatism, gout and infections of the urinary tract." (438-42)

COLLECTING & DRYING:

- 1973 Frantisek Stary & Vaclav Jirasek, Herbs, pg. 86. "B. pendula: The drug is not cultivated but gathered only in the wild." (38-86)

- 1988 Hans Fluck, Medicinal Plants, pg.42. (Betula pendula Roth). "Part Used: Young dried leaves. Leaves are collected in early summer, not more than 1-2 months after they have opened. They are dried in the shade at not greater than 40oc (104oF). (438-42)

VETERINARY MEDICINE:

- 1984 Juliette de Bairacli Levy, The Complete Herbal Handbook For Farm And Stable, pg. 46. "A valuable horse tonic is made from the sap, much used by the Red Indians. To obtain the sap, holes are bored in the tree in the early spring, before the appearance of the leaves. It is preserved for use by pouring a little oil on the surface of the extracted sap, thus keeping it fresh for many months.
USE: Treatment of digestive ailments, diarrhoea, general debility, weak nerves, rheumatism. As an internal and external antiseptic. The leaves increase flow of urine and expel worms. A strong brew should be made, using one handful of the leaves to one cup of water.

DOSE: As a tonic: four tablespoonfuls of the sap mixed into bran. As a mild vermifuge: four oz. of the crude sap. Externally: mix with one part sap to one part milk, and apply. NOTE: The small twigs and inner bark can be used in

place of the sap." (402-46)

MATERIAL USES OF BIRCH:

PREPARING THE BARK FOR USE:

- 1928 Frances Densmore, Uses of Plants by the Chippewa Indians, pg. 386. "It was customary to gather as much bark as possible in June or early in July as the bark is more easily removed at that season. The gathering of birch birch and cedar bark was attended with a simple ceremony, as both these trees are believed to be connected with Winabojo....In old times the procuring of birch and cedar bark was an event in which all participated. A number of families went to the vicinity of these trees and made a camp. A gathering was held, at which a venerable man, speaking for the entire company, expressed gratitude to the spirit of the trees and of the woods, saying they had come to gather a supply which they needed, and asking for premission to do this together with protection and strength for their work. He also asked the protection and good will of the thunderbirds so that no harm would come from them. The reason he asked the protection of the spirit of the woods was that sometimes people were careless and cut trees thoughtlessly, and the trees fell and hurt them. The speaker then offered tobacco to the cardinal points, the sky, and the earth, murmuring petitions as he did so. He then put the tobacco in the ground at the foot of the tree. Filling a pipe, he offered it as he had offered the tobacco, again murmuring petitions. He then lit and smoked the pipe while tobacco was distributed among the company, who smoked for a time. They next day the company divided into small groups and proceeded to cut the trees and remove the bark.

It is the rule that all the chopping of a birch tree shall be on one side so that the tree after felling will rest on the stump. This prevents the bark being soiled by falling on the ground. In removing the bark a vertical cut is made, the bark turned back with the left hand, passed under the trunk of the tree and removed by the right hand. The width of the strips depends on the intended use of the bark. An average width is about 24 inches. The uppermost

branches of a tree are observed with special care as the bark on the upper branches is often clear and smooth, though the trunk of the tree has been scarred, or has had its bark removed at some previous time. The tree is permitted to remain as it falls, and when thoroughly dry is used for fuel.

Utensils are often made as soon as a tree is cut. The sheets of bark for future use are tied in thick packs by means of strips of freshly cut basswood trees that usually grow among the birches. One hundred sheets usually constitute one of these packs. A pack is carried on a woman's back by a strap. This is stored at her home in the village, a larger supply being in a birch-bark storehouse at her maple sugar camp. The uses of birch bark are many and various."

Birch bark can be unrolled only by exposing it to the heat of a fire. When heated it becomes pliable, and retains any form in which it is placed when thus softened. (211-387)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 195. "INDIAN USE: The bark, which can be peeled off the tree in large, flexible, waterproof sheets, was as important to the native peoples of the Interior as the bark of western red cedar was to the Coastal groups. It could be stripped off at any time of the year, but was said to peel most easily in late spring and early summer when the sap was running. Bark with short horizontal lines or lenticels was preferred to that with long lenticels because it would not split and crack when it was being worked on. Only the bark of the western white birch was used; that of the closely related water birch (B. occidentalis), which is reddish-brown in colour, was not of suitable quality and, being thinner, was more difficult to harvest.

In harvesting the bark, two horizontal cuts were made around the tree, one high and one near the ground, and a single vertical cut was made between them. The sheet was then peeled off by lifting the edges along the cuts and pulling horizontally. When properly done, the harvesting did not kill the tree because only the outer bark was removed, not the innermost layer next to the living cambium tissue. However, often an entire tree would be cut down to collect bark from the upper trunk." (137-197)

BASKETS:

- 1928 Frances Densmore, Uses of Plants by the Chippewa Indians, pg. 388. "Makuks: These were of various sorts, according to their use. The most common makuk was that used for storing maple sugar. These makuks were sewed with split roots, like the top of a canoe. They ranged in size from makuks holding about 1 pound of sugar to those holding 20 or 30 pounds. A cover with slanting sides was sewed over the top. A similar makuk of medium or rather large size was used as a bucket, the seams being covered with pitch and a handle attached. The makuks used for gathering and storing berries had straight sides, and the storage makuks were frequently made with the rough outer surface of the bark on the outside. A berry gathering makuk had a loop of fiber attached to one side so it could be hung from a woman's belt as she worked. These small makuks for gathering fruit held about a quart, and the storage makuks or those for carrying the berries frequently held 12 quarts or more. The storage makuks had no binding around the top, and were frequently made with one side higher than the other so it could be lapped over and tied. This sort of makuk was used for storing fish, over which maple sugar was sprinkled. This preserved the dried berries or fish, and it was easier to get at the contents in this type of makuk than in the sort used for maple sugar." (211-389)

- 1973 Carrier Linguistic Committee, Hanuyeh Ghun 'Utni-i, 67. "The Birch tree is white and is found everywhere. Its bark looks like it is peeling. The inner bark is strong. That is why they make baskets out of it. The outer bark is good for nothing. The old-timers made large dishes out of the inner bark. They used them when they were processing fish. They would also use birch dishes when they picked berries. These were called tl'usts'ai. They also made dishes to eat with. Other things they made were canoes, and toboggans. The wood from the birch tree is strong and slippery. That makes it good for toboggans. The old-timers made these things all by hand. They took the spruce roots and with the root fibers they sewed these things together. Sometimes they peeled the willow bark and sewed it as one sews with thread." (280-67)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 197. "Baskets and canoes were the items most commonly made from birch bark by the interior peoples. Some of the Coastal groups, including the Upper Stalo and Bella Coola, also made them on occasion, but they learned the craft from their Interior neighbours. Certain Interior groups, such as the Shuswap, were famous for their skill in working with birch bark. Their baskets were widely traded amongst the peoples of the central and southern Interior." (137-197)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 197. "The baskets were constructed by making four diagonal cuts, two from each edge, toward the middle of a rectangular sheet of bark. The sheet was then folded into a box-like shape, with the cuts directed towards the bottom corners and the edges coming together to form side seams. In accordance with the natural tendency of the bark to curl outward when peeled off the tree, the whitish outer surface of the bark formed the inside of the basket and the reddish-brown inner surface formed the basket's exterior. The side seams were sewn, usually with split cedar or spruce root or willow bark, and a circular hoop of the same material or of willow, cedar, red-osier dogwood, or some other flexible wood, was bound or stitched to the top. Finally the seams were caulked with pitch, and designs, some of them very intricate, were etched on the outer surface. Birch-bark containers were made in a variety of sizes and could be used for picking berries, storing food, boiling food by the hot rock method, and even for packing water. In cooking, green sticks of Saskatoon berry or some other shrub were laid in the bottom of the basket to prevent the hot rocks from burning through the birch bark." (137-197)

BLANKET MATERIAL:

- 1975 Dr. Triska, The Hamlyn Encyclopedia of Plants, pg. 78. "Dwarf Birch (Betula nana L.): Dwarf Birch grows in bogs, moorlands and glacial valleys. It is a sub-arctic species which is often found in association with Mountain Avens (Dryas octopetala) and Dwarf Willows (Salix spp.). It is rare in Britain and occurs only in Northumberland and some of the Scottish mountains.

It is found in northern and Central Europe from the Artic southwards. Probably in some mountain areas it is a relic of the Ice Age flora. In Lapland the fine roots are used to make blankets." (119-78)

BURIAL PRACTICES:

- 1624 Father Theodat Gabriel Sagard, Le gran voyage du pays des Hurons, situe en l'Amerique vers mer douche, es dernier confines de la Nouvelle Franch, dite Canada, Published in translation by the Champlain Soc. XXV 1939 ed. Wrong. fac. ed. 1968 Greenwood, N.Y. 99. "Burial. "when all have arrived there [cemetery] each keeps silent, somestanding, others seated, as it pleases them, while they raise the corpse on high and arrange it in its coffin, made and prepared expressly for it; for each corpse is put intn a coffin apart. It is made of thick bark and is raired on four big wooden pillars, painted a little, about nine or ten feet high; my guess is that in raising my hand, I could not touch the top by more than a foot or two. The corpse being put up, with the bread, oil, hatchets, and other things that they wish to put there, they close it."...251-252." (369-38)

- 1928 Frances Densmore, Uses of Plants by the Chippewa Indians, pg. 386. "Heavy birch bark was wrapped around the bodies of the dead." (211-388)

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 249. "One Southern Tutchone said that his people used to put the ashes of the dead into a birchbark container and place it somewhere up high." (296-249)

CANOE:

- 1509 Caesariensis Eusebii, 1512 Episcopi Chronicon. in Weise 1884 p. 299. Newfoundland. "Seven wild men were brought from that island (which is called the New Land) to Rouen with their canoe...Their canoe is bark, which a man can lift on his shoulders with one hand." (369-37)

- 1534 Jacques Cartier, First voyage to Canada, St. Lawrence transl. 23. "They [the Indians met near Blanc-Sablon] have boats in which they go to sea, that are made of the bark of the birch, from which they catch many fish." (369-37)
- 1535-6 Jacques Cartier, Second voyage to Canada, Quebec transl. 144. "There are many birches"..155-58 Hochelaga (Montreal). "There is in this city about 50 houses, each about 50 paces long or more, and 12 or 15 wide, all made of wood, covered with large pieces of the bark of the said wood, as big as tables, very well sewn, after their manner." [Could be bark of other trees]. (369-37)

- 1603 Samuel Champlain, Des sauvages, ou voyage de Samuel Champlain de Brouage fait en la France Nouvelle, l'an mil six cens trois, Champlain-Purchas Tadoussac 161. "Their canoewes are some eight or nine pases [paces] long, and a pase, or a pase & a half broad in the middest, and grown sharper & sharper toward both ends. They are very subject to overturning, if one knows not how to guide them; for they are made of the barke of a Birch tree, strengthened within with little circles of wood well & handsomely framed and are so light, tha one man will carry one of them easily; and every canowe is able to carry the weight of a Pipe: when they would pass over any land to goe to some River where they have business, they carry them with them...198. But with the canoas of the Savages a man may travell freely and readily into all countries, as well in the small as in the great Rivers: So that directing himselfe by the meanes of the said Savages and their canoas, a man may well see all that is to be seene, good and bad, within the space of a yere or two...Their cabins are low like their tents, covered with the said barke of a tree...159. The men sat on both sides of the house...[each] with his dish made of the barke of a tree." (369-38)

- 1613 Samuel Champlain, Les voyages de sieur de Champlain Xaintongeois, Thatcher Island New England coast 1605 transl.74. "After having stayed some two hours to consider this people, who have their canoes made of birch bark like the Canadians, Souriquois & Etchemins, we raised anchor...Having gone 7 or 8 leagues we dropped ancher [Boston Harbour]...lots of savages who ran to

see us...their canoes are made all in one piece, very hard to turn, if you are not very adroit in steering them: & we had never seen any made in this fashion before...138. HURONS Then they take a sweat and call their friends to take one, too; for they think it the true cure by which to recover health. They cover themselves with
their robes and some big pieces of bark of trees, and have in their midst good many stones which have been heated in the fire. While they are in the sweat, they sing all the time." (369-38)

- 1620 Whitbourne Newfoundland 1579 72. "Cannowes are...made with the rind of birch trees; which they sowe very artificially and close together, and overly every stem with turpentine." (369-38)

- 1680 Bacqueville de la Potherie Michilimackinac. "Refuge of all the savages who trade their peltries...when they choose to work, they make canoes of birch bark which they sell two at three hundred livres each. They get a shirt for two sheets of bark for cabins [Blair 1911 1:282]." (369-39)

- 1749 Peter Kalm, 1748-51 Travels in north America,English Version 1770 2 vols. Quebec 551. "Birch-bark is said to be quite scarce in Canada and birch-bark canoes daily more expensive. Birch-bark Canoes. All the strips and ribs in them are made of white cedar (Thuja); the space between the latter varying in breadth between that of a palm and the width of three digits. The strips are placed so close to one another that one cannot see the birch-bark between them. All seams are held together by spruce roots or ropes made of the same material split. In all the seams the birch-bark has been turned in double. The seams are made like a tailor's cross-stitch. In place of pitch they use melted resin on the outside seams. If there is a small hole in the birch bark, resin is melted over it. The inside of the bark or that nearest the tree always becomes the outer side of the boat. The whole canoe consists ordinarily of six pieces of birch-bark only, of which two are located underneath and two on either side. The bark strip directly underneath is sometimes so long that it covers three fourths of the canoe's length. I have not yet seen a boat whose bottom consisted of one piece only. Birch-bark

canoes are dangerous to navigate, because if the sail is forced down in stormy weather, it may splinter the bottom of the boat." (369-40)

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 249. "Birchbark canoes were evidently of the same shape and made much the same way as those made of spruce, but were much rarer in southern Yukon because good birch is so scarce. Several pieces of bark were needed to make a single canoe, and the length seldom exceeded 10 feet. Although they could be built in a day or two and were light to carry, birch canoes are said to have broken very easily. It is probable that the Southern Tutchone made them more often than did the other two tribes." (296-269)

- 1976 T. Christopher Brayshaw, Catkin Bearing Plants of British Columbia, B.C. Provincial Museum, No. 18 Occasional Paper Series, pg 144. "White birch was an important tree during the fur-trading period, when the traders relied on this species to provide the bark for building their canoes." (164-144)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 195. "Canoes were also made from a single piece of bark, folded and sewn onto a frame of willow or cedar withes. The seams and cracks were sealed with pitch. Some of the canoes were 4.5 m (15 ft) or more in length. They were strong yet buoyant and with proper handling were capable of tremendous speeds. Some of the canoes made by Athapaskan groups such as the Carrier were so skillfully constructed that they could be dismantled and folded for portaging." (137-199)

CHARCOAL:

- 1975 Dr. J. Triska, The Hamlyn Encyclopedia of Plants, pg. 276. "Betula pendula Roth (Silver Birch): From the charcoal of the bark, material for painters and printers is made." (119-276)

COOKING CONTAINERS:

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 209. "The fresh meat of large game is usually boiled or roasted. One man said that in aboriginal times people cooked in large squarish birchbark containers which had four handles, one on each side. These were hung on four sticks which had been driven into the ground. The "pot" was then filled with snow or water and the meat put in. Next, hot stones were dropped into the basket by means of "tongs" made of two separate sticks, the ends of which had been whittled flat on one side. "A whole lot" of stones were needed, since five or six would be in the pot while others were heating in the fire. The informant did not mention rinsing the stones off, and I neglected to ask about it, but this was the rule for the other two tribes and was probably a Tutchone practice as well. Some older Tutchone declare that they still like to stone boil in winter. They say that they can locate the proper stones under the snow, "on the hillside." Peeled sticks are used to stir the food." (296-209)

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 210. "The [bear] grease used to be rendered by putting fat and water into a large birchbark container. The mixture was then stone boiled for a long time and finally allowed to cool. Later the refined grease was remelted and poured into clean moose-stomach containers." (296-210)

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 281. "The Tagish told of aboriginal wooden cooking spoons, which had long straight handles very like modern kitchen spoons. Each person also had his own ladle-like modern kitchen spoon for everyday use, perferably made of birch, since willow turns black and spruce and jack pine taste pitchy. The Southern Tutchone described these wooden ladles as having "short" handles." (296-281)

COMPOST:

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 64. "Besides being an aesthetic addition to home gardens, birch is an excellent companion plant. Use it on the outskirts of your compost pile to encourage fermentation; compost action is believed to be stimulated by substances secreted by birch roots. According to Companion Plants and How to Use Them, soil from the vicinity of birches helps heal ailing plants and restores fertility to barren or averacid soils." (444-64)

COSMETICS:

- 1973 Frantisek Stary & Vaclav Jirasek, Herbs, pg. 86. "B. pendula: 'Birch Juice' is gathered in spring by tapping of the tree trunks and is used as an additive in perfumery. Birch oil, also used in perfumery, is recovered from the young buds in quantities of 3.5 to 8 per cent, mainly in the United States." (38-86)

- 1977 Schauenberg & Paris, Guide to Medicinal Plants, pg. 199 [Betula pendula, Roth]. "..in the cosmetic industry as a component of many lotions and creams. The fragrance known as 'Russian leather' is produced by treating skins with a birch pitch." (439-199)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 199. "The Shuswap steeped birch leaves in water to make a shampoo, and mixed birch leaves, children's urine, and alkali clay from the edges of certain lakes to make soap for washing the skin." (137-199)

- 1983 Tom Brown Jr., Tom Brown's Field Guide To Wilderness Survival, pg. 92. "The tea [from leaves, bark, or sap] can be used as a wash for de-scenting the body before hunting or trapping." (270-92)

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 64. "Birch twig facial steams are reported to be therapeutic for clogged sinuses; as an added bonus, the fragrant steam helps clear the complexion of acne. If you're

troubled by skin eruptions, add birch decoctions to the bath water. Dried, finely powdered birch inner bark is a good addition to bath powders for chafed skin. Gargel with birch tea to freshen the breath. In Germany and Austria, birch leaf extract is a common ingredient in commercial hair preparations; at home you can prepare birch tea hair rinse for scalp infections and dandruff. The Chinese use birch roots and bark decoctions as dye for hair and beards." (444-64)

COVERINGS FOR DWELLINGS:

- 1928 Frances Densmore, Uses of Plants By the Chippewa Indians, pg. 389. "Sheets of bark were sewn together with basswood fiber (not twisted) and made into the "birch-bark rolls" used as covers for dwellings, the sheets of bark being placed horizontally. Sticks across the ends of the roll kept it from tearing. These rools were used most frequently on the tops of the wigwams, or lodges with frames of bent poles, but were also used on the conical tipis, and sometimes on the roof of the lodge in which maple sugar was made, this lodge having a frame like that of a house." (211-390)

CULTIVATION:

- 1624 Father Theodat Gabriel Sagard, Le gran voyage du pays des Hurons, situe en l'Amerique vers mer douche, es dernier confines de la Nouvelle Franch, dite Canada, Published in translation by the Champlain Soc. XXV 1939 ed. Wrong. fac. ed. 1968 Greenwood, N.Y. 99. "They also sow many native pumpkins and raise them with great ease by this invention: The Huron women in season go to the neighbouring forests to gather a quantity of rotten wood powder around old stumps; then having prepared a large bark box they make a layer in it of this powder on which they sow the pumpkin seeds; afterward, they cover it with another layer of the same dust and again sow seeds, up to two, three, and four times, as much as they wish in such a way nevertheless that there still remains four or five good fingers of empty space in the box, in order to leave room for the shoots of the seeds. Afterwards they cover the box with a large piece of bark and put it on two poles suspended in the smoke of the fire,

which heats gradually the powder and then the seeds so much that they sprout in a very few days; being well grown and ready for planting they take them in bunches with their powder, separate them, then plant them in the places prepared, from whence they afterward gather the fruit in season." (369-38)

- 1974 William H. Hylton, The Rodale Herb Book, Rodale Press Book Division, pg. 367. "Birches improve the soil, restore fertility to barren soil, and planted near the compost area, encourage fermentation. Leaves should be added to the compost." (225-367)

- 1974 William H. Hylton, The Rodale Herb Book, Rodale Press Book Division, pg. 366. "Various species of birch can be used effectively in the garden landscape plan. They will add a distinctive charm in the dormant searon with their delicate branches and conspicuous barks. They blend well into a naturalistic or woodland type of planting, or near a rocky pool where the autumn gold nf the leaves reflects in the water." (225-366)

- 1985 Eleanor Lawrence, The Illustrated Bonk of Trees & Shrubs, pg. 136. "Banoe Birch is also used as rootstock for grafting large-leaved birches. It is uncommon in England, to be seen only in large parks and gardens." (403-136)

DISHES AND TRAYR:

- 1928 Frances Densmore, Uses of Plants By the Chippewa Indians, pg. 389. "Dishes and Trays: For temporary and household use the birch-bark dishes were not always stiffened and bound at the top. The dishes for common use were made of birch bark folded and fastened with one or two stitches at each end. These were tied in bunches of 10 for packing or storage. The common size was about 10 inches long and 5 inches deep, though smaller and larger ones were frequently made. The shallow trays are more often seen with better finnish, the superfluous bark being cut away at the ends, the overlapping edges sewed with split roots and the top finished with a stiff piece of bark, firmly sewed in place. Slippery elm bark was sometimes chewed and applied like gum to the inside of the seams on birch-bark containers to make them water-tight. The

largest trays were those used for winnowing wild rice. Somewhat smaller trays were used for various household purposes, including the carrying of coils of basswood fiber for making into twine. An old and rarely seen form of birch-bark dish was round, about 9 inches in diameter and 3 inches deep. The bark was adjusted in folds around the sides and the dish or tray was finished at the upper edge with two rows of sweet grass." (211-389)

DYEING:

- 1928 Frances Densmore, Uses of Plants By the Chippewa Indians, pg. 370. "RED DYE:

Betula papyrifera Marsh. (White Birch).
Cornus stolonifera Michx. (Red-osier Dogwood. Outer and inner bark).
Quercus species (Oak)
Ashes from cedar bark
Hot Water

DIRECTIONS: Boil the barks in the hot water. Prepare the ashes by burning about an armful of scraps of cedar bark. This should make about 2 cups of ashes, which is the correct quantity for about 2 gallons of dye. Sift the ashes through a piece of cheesecloth. Put them into the dye after it has boiled a while, then let it boil up again, and then put in the material to be colored. Do not let a man or any outsider look into the dye. (211-370)

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. nana). "Smooth Dwarf Birch, rarely grows above 3 feet in height. The leaver are said to dye a better yellow than the common Birch." (141-104)

- 1977 Judy Waldner McGrath, Dyes From Lichens & Plants, pg. 104. "Betula glandulosa (Ground or Dwarf Birch): This dwarf birch has tiny oval serrated leaves, dark green in the summer and a beautiful, fiery red-orange in the fall. The plant is high in resin and where abundant is used for fires. Betula glandulosa is known from Alaska through Greenland and south into most

of the Canadian provinces and the central and northeastern United States. It is not usually found in the high Arctic.

> The summer leaves of the birch probably make a clear yellow dye like that of the willow leaves. The Leaves and bark of southern species from the birch family are recommended for dyes. For best dye results the following ratios are suggested: 2 lbs. leaves to 1 lb. wool. 1 lb. branches to 1 lb. wool.
>
> METHOD 4: Place finely chopped pieces in a pot and cover with lukewarm water. Let stand overnight. Bring slowly to a boil and simmer 2 to 12 hours. Strain the plants from the dyebath and cool. Add clean, wet, alum-treated fiber and simmer 2 to 12 hours, depending on desired color. In the case of heather, willow, birch, Labrador tea, rhododendron and some other woody plants it is not necessary to use alum-treated fiber. You may use washed untreated fiber instead.

By Method 4 the branches and untreated wool produce a warm tan similar to the tan color of the seaweed dye shown on Plate XIII. By Method 4 the branches with alum-treated wool produce a golden tan like that of Rhacomitrium lanuginosum moss, Plate XII, or Cetraria nivalis & C. cucullata lichens, Plate X." (111-104)

- 1978 Hermine Lathrop-smit, Natural Dyes, pg 59. "This recipe gives the general method for dyeing with tree barks. 200 grams wool, 400 grams tree bark, 8 litres water. Break the twigs and soak them overnight. Simmer the twigs for 3 to 5 hours or longer. Layer wool with the bark and twigs and simmer 2 to 5 hours or longer. Remove the wool, rinse and dry. The dyestuff can be used again. Colour: grey-brown with birch. For greenish tones when dyeing with birch, use blue vitriol to mordant. Colour fastness: good.

FANS:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390. "These were made in the woods whenever needed, two pieces of bark being sewed together and slipped into a cleft stick, which served as a handle. A man might carry a fan ornamented with feathers, one specimen having the bark cut off squarely and a row of stiff feathers forming the upper portion of the fan. Plate 55, a, shows an owl-feather fan with handle of birch bark. A woman used an ornamented fan." (211-390)

FIREWOOD:

- 1743 James Isham, Observations on Hudson's Bay and notes and observations on a book entitled 'A Voyage to Hudson Bay in the Dobbs Galley 1746-7', 136. "Their grow's here Large Berch tree, which they call (wursequatick), on the Root of the branches of the said tree, grow's Large Knops of wood of Different form's which they style (posogan) which posogan is of great service to the Natives, they using itt to strike Light to, as we do touch wood, itts very soft & spunge and Very Light when Dryed., itts substance Resembles Spunge, some being soft, some hard, according to the time geather'd, and is of a Yellowish Colour, some of which pieces is as big as a peck, - and this posogan when once Light is Very Difficult to put out, if not tak'n in time, and if not put out will Clow and Bur'n tell quite Consum'd to ashes and never Blaze." (369-39)

- 1954 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 117. "As firewood, it varies with the species; that of yellow and black birch produces better live coals than that of white and gray." (71-117)

- 1975 Catharine McClellan, My Old People Say, An Ethnograplhic Survey of Southern Yukon Territory, Part 1, National Museums of Canada, Publications in Ethnology, No. 6(1), pg. 245. "Inland Tlingit at Atlin insisted that birchbark torches of some kind were used to light the houses." (296-245)

- 1983 Tom Brown Jr., Tom Brown's Field Guide To Wilderness Survival, pg. 92.

"Birch bark makes a tinder that burns even when soaking wet." (270-92)

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 136. "Fresh birchwood burns well for green wood, because of inflammable resins in the wood." (403-136)

FUNNELS OR CONES:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 389. "Funnels or cones: These varied in size from the tiny cones filled with hard sugar and hung on a baby's cradle board and the somewhat larger cones similarly filled for the delectation of children to the large funnels made of heavy bark and sewed with split roots that were used chiefly for pouring hot fat into bladders for storage. Spoons made of bark were also used." (211-388)

INK:

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "B. pendula (Silver Birch): Birch soot was formerly used to make carbon black for printing ink." (403-134)

IMPLEMENTS (General):

- 1640 John Parkinson, Theatrum Botanicum, pg. 34. "Many civill uses the Birch is put unto, as first to decke up houses and arbours, both for the fresh greennesse and good sent (scent) it casteth; it serveth to make hoopes to binde caskes withall; the young branches being fresh are writhed, and serve for bands unto faggots; of the young twigges are made broomes to sweepe our houses, as also rods to correct children at schools, or at home, and was an ensigne born in bundles by the Lictors or Sergeants before the Consulls in the old Roman times, with which, and with axes borne in the like manner, they declared the punishment for lesser, and greater offenses, to their people." (345-34)

- 1551-68 William Turner, The first and second partes of the herbal of William Turner doctor in phisick, Herbal England. "Birch...Fisherers in Northumberland England pull off the uttermost bark and put it in the clyft of a sticke and set in fyre and hold it at the water side and make fish come thether, which if they se they stryke with theyr leysters or sammon speres. The same is good to make hoopes of and twigges for baskettes, it is so bowings." [Rhodes 1922:89]

- 1609 Marc Lescarbot, Nova Francia, a description of Acadia 1606, 301. "As for the trees of the forests, the most common in Port Royal be...birch (very good for joiner's work)...247." (369-38)

- 1624 Father Theodat Gabriel Sagard, Le gran voyage du pays des Hurons, ritue en l'Amerique vers mer douche, es dernier confines de la Nouvelle Franch, dite Canada, Published in translation by the Bhamplain Soc. XXV 1939 ed. Wrong. fac. ed. 1968 Greenwood, N.Y. 99. "Tnrches made of little horn-shaped rolls of birch bark were used...122-25. At each end of the hourses there is a porch, and these porches serve them principally for holding their vats and tuns of bark, in which they store the corn, after it is very dry and shelled...As for the fish of which they make provision for winter, after it is smoked they store it in bark vats called Acha...For fear of fire, to which they are subject, they often put whatever they have that is most precious into vats and bury them in deep holes dug in their cabins and then cover them with the same earth; this gives protection not only from fire but also from the hands of thieves for they have no other chest nor closet in all their household but these little casks...102. The women made the baskets, both of reeds and birchbark, to hold the beans, corn, peas, meat, fish and other foods, and the bark bowls used for drinking and eating"...57-60. While on a journey with the Hurons the shelter was made of two pieces of birchbark laid against four small poles stuck into the ground...Sagamite was served in bowls of birchbark that each man carried with him, together with a large spoon..."The bowls could hardly have a pleasant smell, for when they were under necessity of making water in their canoe they usually used the bowl for that purpose; but on land they stoop down in some place apart with decency and modesty that were anything but savage."...28. (369-38)

- 1639 LeJeune 1610-1791 Travel and explorations of the Jesuit Missionaries in New France, vol. 17; 29. Granaries or chests of corn in use among the Hurons...both elm and birchbark were used for such utensils, as well as for many other household purposes. [Remains of birchbark boxes or storage receptacles have been found on Huron and other villages sites, according to an explanatory note by Waugh 1916]." (369-39)

- 1643 Lalement 1610-1791 Travel and explorations of the Jesuit Missionaries in New France, vol. 26; 113. The French who dwelt far from settled areas around Quebec were often forced to rely upon Indian implements and utensils since difficulty of obtaining an adequate supply in remote places was sometimes great. Bark containers were in frequent and widespread use at Tadoussac. (369-39)

- 1691 Christien LeClercq, Histoire de la Nouvelle France, book 2; 96. Besides the canoe and snowshoe, industries which were developed by such peoples as the Abenaki, Huron and Micmac, an export trade in curios, ornamental canoes and such trinkets sprang up in Acadia at that time. (359-39)
- 1698 Father Louis Hennepin, A new discovery of a vast country in America, Fort Frontenac 580. "Our Spanish wine failing us, we made more of wild Grapes, which were very good; we put it into a little Barrel, in which our Wine was kept that we brought with us, and some bottles. A wooden-Mortar and an Alter-Towel was our Press. The fat [vat] was a Bucket of Bark. Our candle was chips of the Bark of the Birch-Tree, which lasted a small while." (369-39)

- 1799 Isaac Weld, Travels through North America, pg. 17. "It is for their very curious bark-work that the sisters of this convent [the Ursulines at Trois-Rivieres] are particularly distinguished. The bark of the birch tree is what they use, and with it they make pocket-books, work-baskets, dressing-boxes, &c.&c. which they embroider with eld hair, died of the most brilliant colours. They also make models of the Indian canoes, and various war-like implements used by the Indians. Nearly all the birch bark canoes in use on the St. Lawrence and Utawa Rivers, and on the nearer lakes, are manufactured

at Three Rivers, and in the neighbourhood, by Indians." (131-Birch)

- 1807 George Heriot, Travels through the Canadas, pg. 283. "Wandering nations, such as the Algonquins, who remain but for a short time in one situation, are satisfied with making their huts extremely low, and with placing them in a confused manner. They generally carry with them large rools of the bark of the birch-tree, and form the frames of the cabins of wattles or twigs stuck into the earth in a circular figure, and united near their upper extremities. Upon the outside of this frame the bark is unrolled, and thus affords shelter from rain and from the influence of the sun." (131-Birch)

- 1824 Bishop George Mountain, Visit to the Gaspe' Coast, pg. 12. "If you want any extra light [the Indians] make a candle in a moment with a twisted piece of birch bark, & if you desire to have it fixed it is set in a split stick planted in the ground; but it requires frequent snuffing. So if you are short at any time of a cup for drinking, or a vessal for bailing the canoe, the want is supplied in half a moment by a kind of bowl or scuttle of bark which if held properly, so as to keep it tight, in the hand, retains the water even without being stitched." (131-Birch)

- 1829 Sir George Head, Forest Scenes and Incidents, pg. 283. "Not only are the canoes in which the Indians trust themselves on lakes sufficiently boisterous, some miles from the shore, made of it, but also all sorts of small cups and dishes. Besides, it burns like pitch; splits into threads which serve for twine; and the filmy part, near the outside, may be written upon in pencil, making no bad substitute for paper." (131-Birch)

- 1853 Samuel Strickland, Twenty-Seven Years in Canada West, pg. 53. "The squaws have a curious method of forming patterns upon this bark with their teeth, producing very elegant and elaborate designs. They double a strip of bark many times into angles, which they bite at the sharp corners in various forms. Upon the piece being unfolded, the pattern appears, which is generally filled in very ingeniously with beads and coloured porcupine quills. The squaws perform this work in the dark quite as well as in the daylight." (131-

Birch)

- 1862 Bernard R. Ross, An Account of the Botanical and Mineral products, Useful to the Chipewyan Tribes of Indians, Inhabiting the McKenzie River District. Canadian Naturalist and Geologist 7. 133-137. "The Canoe or Paper Birch (Betula papyracea)...Its bark is used in the construction of canoes, and in the manufacture of various utensils for dnmestic use, such as drinking cups, dishes, and baskets. It also yields spunk or touchwood of the best quality. Of its wood, platters, axe-helves, paddles, snnw-shoe-frames, dof-sleds and other articles are made, and as it is a strong and durable material, of close grain, and susceptible of receiving a tolerable polish, the vhite residents avail themselves of it for the construction of furniture." (305-42)

- 1931 M. Grieve, A Modern Herbal, pg. 103, (B. alba). "The wood soft and not very durable, but being cheap, and the tree being able to thrive in any situation and soil, growing all over Europe, is used for many humble purposes, such as bobbins for thread mills, herring-barrel staves, broom handles, and various fancy articles. In country districts, the Birch has very many uses, the lighter twigs being employed for thatching and wattles. The twigs are also used in broom making and in the manufacture of cloth. The tree has also been one of the sources from which asphyxiating gases have been manufactured, and its charcoal is much used for gunpowder." (141-103)

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. lenta). "..is an American variety, with richly-marked wood suitable for the use of cabinet and pianoforte makers." (141-104)

- 1972 Jeanne Rose, Herbs & Things, pg. 44. "The bark...it was also used as the skin of some World War II planes. The wood is hard and reddish-brown and is made into furniture and plywood." (314-44)

- 1975 Dr. J. Triska, The Hamlyn Encyclopedia of Plants, pg. 276. "The white wood is soft and light but durable. It is used in the manufacture of furniture, also of tool-handles, and in wood carving. The twigs are used for

thatching and for making brooms." (119-276)

- 1978 V. H. Heywood, Flowering Plants of the World, pg. 60. "Branchlets of Betula species are used to make the besom brushes used by gardeners." (118-60)

- 1978 Nancy J. Turner & Adam F. Szczawinski, Wild Coffee and Tea Substitutes of Canada, pg 49. "The wood of the sweet and yellow birches is heavy, hard, strong, and straight-grained. It is used in flooring, furniture, plywood, veneer, railway ties, and in the hardwood distillation industry. In Canada, yellow birch far exceeds sweet birch in importance because it is so much more abundant." (98-49)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 199. "BIRCH BARK was also used for wrapping foods for storage, lining graves and covering corpses, splinting broken limbs, binding implements, and as roofing for temporary shelters. The Lillooet placed funnel-shaped circles of birch bark arond the poles of raised food caches to protect them from climbing rodents. The Tahltan made snow goggles from the bark, the Beaver made moose calls, and the Carrier made toboggans. The Lillooet, Thompson, Shuswap, and other groups made birch-bark infant carriers, cradles, and urine conduits but the watertight qualities of the bark made it hot and uncomfortable for babies in the summer." (137-199)

- 1979 Nancy J. Turner, Plants In British Columbia Indian Technology, 199. "BIRCH WOOD, of uniform texture, strong, and close-grained, but not durable, was employed in a variety of capacities. The Lillooet carved dishes, cups, spoons, and digging-stick handles from it. The Carrier used it to make mauls, digging sticks, and snowshoe frames, and the Tahltan for snowshoe frames and ground sticks, bows, and gambling sticks. Birch-wood snowshoes were said to be excellent for dry snow but absorbed moisture and became too heavy in wet snow. The Beaver sometimes used birch for arrows. On the Nass River, the Niska made birch-wood spoons and masks and twisted ropes from the roots for lashing fishing weirs. The Haida imported birch wood from the Nass to make seaweed-chopping blocks, used in the traditional preparation of the edible

Porphyra seaweed. Some Kootenay people have recently used birch wood for smoking bacon. Both western white birch and water birch were used as a general fuel by the Okanagan, Shuswap, and other Interior groups." (137-199)

- 1984 Marilyn Walker, Harvesting the Northern Wild, pg. 41. "Athapaskans traditionally have used birch in numerous ways. The bark was wrapped around fractures; rolled up into a tube for calling moose...Bark containers were made in various sizes for storage, gathering or for use as drinking cups. The wood was used for a wider range of implements, from tobaggans to snowshoe frames to spoons, bows and arrows, and canoes." (305-41)

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 136. "The bark was used by the American Indians to cover their dwellings, to make water vessels, and, as its name implies, also to cover their canoes." (403-136)

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "B. pendula (Silver Birch): Birch wood is flexible and tough, but not very strong. However, it provides useful and decorative veneers for carpentry and furniture. Particularly valuable are veneers from the wood of the lower part of the trunk and of stumps from exposed sites (on rocks, at forest edges)." (403-134).

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 64. "On pioneer cabins, the bark was often used as sheeting under sod." (444-64)

INSECT REPELLANT:

- 1931 M. Grieve, A Modern Herbal, pg. 103, (B. alba). "The white epidermis of the bark is separable into thin layers...It yields oil of Birch Tar..The production of Birch Tar oil is a Russian industry of considerable importance. It is also distilled in Holland and Germany, but these oils are appreciably different from the Russian oil. It has the property of keeping away insects and preventing gnat-bites when smeared on the hands. It is like-wise employed in photography." (141-103)

LUMBER:

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 118. "Betula lutea Michx.f.: This tree is the most important of the commercial birches and probably furnishes three-forths of the lumber marketed under the name 'birch'. (71-118)

MEAT BAG:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390. "This was commonly made of birch bark covered with soft tanned leather, but was also made of rawhide. It was carried on a pack strap and was used for carrying dried meat or other provisions needed on a journey. It was customary to open the bag and allow the flap to become a sort of table, from which the fragments of food were easily returned to the bag, a custom which illustrates the lack of wastefulness among these people." (211-390)

MUSIC INSTRUMENT:

- 1977 Brodzky, Danesewich, & Johnson, Stones, bones, and skin: ritual and shamanic art, pg. 57. "Mouth bow; a piece of white birch is bent to make this bow. There is a deep notch carved at each end, so a string of twisted sinew may be attached from one end of the bow to the other. The stick is pointed at one end, with sinew wrapped around the other end. To play this instrument, one end of the bow is placed in the mouth, the other end held with the left hand, and the cord is played either with the pointed end of the stick or with the finger." (322-57)

PUNISHMENT:

- 1976 Francis H. Elmore, Shrubs and Trees of the Southwest Uplands, 116. "In pioneer days, slender birch twigs (more technically called birch rods) were used to "birch" unruly school children. A reminder of olden times endures in

the expression "spare the rod and spoil the child." Its long, straight stems have often furnished emergency fishing rods for school children playing hooky, necessitating the later use of a "rod" at home or in school." (374-116)

SMOKING MIXTURE:

- 1984 Marilyn Walker, Harvesting the Northern Wild, pg. 41. "The fungus growth on birch trees was scraped off and used as tinder or as a tobacco substitute and additive, and could be dropped into boiling water to produce a tea." (305-41)

SNOW GLASSES:

- 1984 Marilyn Walker, Harvesting the Northern Wild, pg. 41. "Athapaskans...and cut into a strip and with small holes, to be bound across the eyes against snow-blindness." (305-41)

STORAGE OF FOOD:

- 1980 People of 'Ksan, Gathering What the Great Nature Provided, Food Traditions of the Gitksan, pg. 27. "Birch bark is important in food preservation. Our experienced woodsmen point out that if the bark is left on a fallen birch tree, the wood rots; this does not happen with any other species of tree. They believe that the rot occurs because birch bark, being watertight and airtight, "overseals" the fallen tree. We made good use of this characteristic of birch, which was the aluminum foil of our grandfathers.

When our people stored dry-smoked fish they put a layer of birch bark between each fish "so that if one fish rots the next won't spoil too." An excavation beside a very ancient fishing hole (three or four thousand years old) unearthed neat piles of good-sized birch bark squares, presumably stacked and ready to use in the food holes, storage boxes and ovens.

A recent excavation of the base of a totem pole, which had been raised between 1850 and 1860, uncovered a large birch bark food package which had contained berries. Only the seeds remained after 120 years, but we estimate

that the berries would have remained edible for several decades." (133-27)

- 1980 People of 'Ksan, Gathering What the Great Nature Provided, Food Traditions of the Gitksan, pg. 22. "In ancient times, the Great Nature provided another excellant food storage place, the earthen pit or food storage hole known as anyuusim yip. These pits are found in various shapes and sizes....excavations of storage holes that have not been used for many, many years show a cone-shaped or thimble-shaped hole about three feet in diameter and three or four feet deep....usually lined with birch bark. All the old-style storage holes were situated close to a village, just off a trail....We are not sure what tool was used for these excavations. Some say that a sharpened pole was driven into the ground at the centre of the hole-to-be, then rotated in ever widening and deepening circles until a cone-shaped hole resulted. All the old-type holes were carefully disguised to prevent discovery by two-legged or four-legged thieves. Perhaps there was special emphasis on the four-legged variety, for thievery was not common among our ancestors. The food was wrapped in birch bark and the bundles were placed in the hole, which might be lined with birch bark or with boughs of various types. Food parcels were packed to within eight or ten inches of the top, then various coverings were piled on. One of the best was very dry coniferous needles..."Pile 'em on top, maybe six inches deep. Mice don't like them needle..no animal like to stick his nose into them needle. Them needle has to be real brown, never green. Us kids used to get sacks of 'em for the anyuusim yip. Every precaution was taken to disguise the scent of the food. Earth was piled on top of the needles, boughs or bark. One authority claims that burnt bark was used: "No animal like to go near that burning smell." The holes were usually opened when the frost was still in the ground, and then completely emptied of their contents, since clean, dry coverings were hard to come by under winter conditions." (133-22)

TANNING:

- 1931 M. Grieve, A Modern Herbal, pg. 103, (B. alba). "The white epidermis of the bark is separable into thin layers, which may be employed as a substitute

for oiled paper and applied to various economical uses. It yields oil of Birch Tar, and the peculiar, well-known odour of russia leather is due to the use of this oil in the process of dressing. It like-wise imparts durability to leather, and it is owing to its presence that books bound in russia leather are not liable to become mouldy. The production of Birch Tar oil is a Russian industry of considerable importance. It is also distilled in Holland and Germany, but these oils are appreciably different from the Russian oil." (141-103)

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "B. pendula (Silver Birch): In some parts of Europe the wood and bark are distilled to yield birch tar for dressing hides and making 'Russian' leather for waterproof footwear." (403-134)

TORCHES AND TINDER:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390. "Various forms of torches were made by twisting birch bark into cylinders, some of which would last an entire night, and were used by travellers. Slender torches, which would last an entire night, and were used by travellers. Slender torches, which could be stuck on the end of a stick that was upright in the ground, were used by women when working around the camp. A woman kept a supply of scraps of thin birch bark for use in kindling fires." (211-390)

- 1973 Alan Hall, The Wild Food Trailguide, pg. 61. "It is extremely resinous and will, when soaking wet, burn with a hot enough flame to dry out and ignite small twigs." (79-61)

WRITING OR ART MATERIAL:

- 1624 Father Theodat Gabriel Sagard, Le gran voyage du pays des Hurons, situe en l'Amerique vers mer douche, es dernier confines de la Nouvelle Franch, dite Canada, Published in translation by the Champlain Soc. XXV 1939 ed. Wrong.

fac. ed. 1968 Greenwood, N.Y. 99. "Each town or village of the Hurons had its special coat of arms which the travellers erected along the route when they wished it known that they had passed there. In one case, the coat of arms of the town of Quieunonascaran was painted on a piece of birchbark as large as a sheet of paper. It consisted of a roughly outlined canoe, drawn in it were as many black strokes as there were men on the trip. To indicate that Sagard was with them, the Indians roughly drew a man in the middle above the strokes. At the bottom of the piece of bark, they tied with a shred of bark, a piece of dry wood about half a foot long and three fingers thick. Then this coat of arms was hung on the top of a pole struck in the ground so that it leaned over a little..283-84." (369-38)

- 1703 Baron de. L.A. Lahontan, New Voyages to North America, 1:370. "There are some little Baskets made of the young birches, that are much esteemed in France; and Books made of 'em, the leaves of which will be as fine as Paper...I have frequently made use of 'em for want of Paper, in writing the journal of my Voyages." (369-39)

- 1857 Henry Rowe Schoolcraft, History of the Indian Tribes in the United States, vol. 6, p. 631. "Amongst the Chippewas of Lake Superior there exists a very ingenious art of dental pictography, or a mode of biting figures on the soft and fine inner layers of the bark of the betula papyracea, specimens of which are herewith exhibited. This pretty art appears to be confined chiefly to young females. The designs presented are imitations of flowers, fancy baskets, and human figures. There are so many abatements to the amenities of social life in the forest that it is pleasing to detect the first dawnings of the imitative and aesthetic arts." (211-392)

- 1862 Bernard R. Ross, An Account of the Botanical and Mineral products, Useful to the Chipewyan Tribes of Indians, Inhabiting the McKenzie River District. Canadian Naturalist and Geologist 7. 133-137. "The Canoe or Paper Birch (Betula papyracea)...Since the advent of missionaries into these wilds, the natives who are Christianized use the bark for paper on which to engrave their syllabic literature, as well as for letter-writing." (305-42)

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390.
"FIGURES: A variety of figures were cut from birch bark. (Pls. 52, c; 56.) Some appear to have been for pleasure, while others represent dream symbols and totem marks (clan symbols)." (211-390)

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390.
"PATTERNS: Every woman who did beadwork had patterns cut from stiff birch bark which she laid on the material to be decorated. Mrs. English said that she remembered when patterns were pricked with a stiff fishbone around the outline and then cut with sissors. In this way the pattern was evident to the eye before the cutting was begun. With very few exceptions the cut patterns collected by the writer show no trace of a marking implement, the appearance being that the patterns are cut without tracing. (Pl.57)" (211-390)

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 396.
"ETCHING AND SELF-PATTERNS ON BIRCH BARK: Bark taken from birches in the early spring has the tender "sap-bark" of the previous year next to the outer bark. If the bark gathered at this time is put in hot water the "sap-bark" turns dark brown while the outer layers of bark remain light in color. This renders possible a wide variety of decoration in contrasting colors. Dishes are made with this dark color as a foundation and the decoration is supplied with a sharp implement, the lines showing the light color of the under layer of bark and the contrast remaining after the bark has dried. The implement used for this purpose was a pointed stick or the "splint-bone" from the heel of a deer, preferably a young doe. The bark is in the right stage for this work at the season of sugar making, and many sugar makuks are made with the dark surface of the bark on the outside, etched with simple decorations. A typical example is the sugar makuk in Plate 34, which is etched with parallel horizontal lines between which are vertical, diagonal, or zigzag lines arranged in simple groupings. The fresh sugar was often stored in them and used as a gift, the decoration making the gift mnore attractive. At the present time this work is frequently done in a freehand drawing of leaves and flowers, the designs being without artistic value.

Another type of decoration made possible by the condition of the bark at this season may be called "self-patterns" in birch bark. Sometimes the pattern appears in the light color on a dark background and sometimes the colors are reversed, the design being in the light shade. In a typical example of this work a rather large, conventional pattern cut from birch bark or paper is laid on the bark and a line is drawn around it....The design is etched on the inner surface of the freshly cut bark, cutting through the "sap-bark," after which, if desired, the work may be laid aside. When it is to be finished the bark is moistened with hot water, and on the portion which is to be in light color the thin tissue of bark is removed in small particles or shreds with a sharp knife. Thus if the makuk is to be dark in color with light-colored leaves the surface within the etching of the leaves is carefully removed. If the colors are to be reversed it is necessary to remove all the surface except that within the etching. As indicated, if the makuk is to be filled with fresh sugar it is finished at the camp, but if the article is to be for some general purpose, the woman does the part of the work which must be done while the bark is fresh and takes the article with her, to finish at leisure. The completion can not, however, be deferred too long or the dark surface of bark can not be removed with neatness." (211-397)

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 390.
"TRANSPARENCIES: The most primitive form of Chippewa art is that in which the only material is a broad leaf or thin piece of birch bark and the only material is a broad leaf or thin piece of birch bark and the only tools are human teeth and deft fingers. The leaf or birch bark is folded and indented with the teeth, this process being repeated according to the elaborateness of the design. The result is a transparency, the surface of the leaf or bark forming the back-ground and the tooth marks forming the pattern. The native word for this is composed of two words, one meaning picture, and the other 'he bites' or 'gnaws'. The leaf and bark are not wholly opaque and the tooth marks do not cut entirely through them, so the finished work shows a heavier and a lighter density of material which is soft and pleasing to the eye. The teeth used in making the impression were the eyeteeth and "side teeth", the folded material being indented in a variety of ways, ranging from a sharp

prick, like the prick of an awl, to a broad mark produced by slightly twisting the bark between the teeth....The bark used was the soft, fine inner layers of the white birch, and it was slightly warmed to render it more pliable.

The art had two branches, one of which appears to have been an outgrowth of the other and to have been practiced less extensively. The principal, and apparently the first, phase of the art was intended chiefly for pleasure and had a secondary use in suggesting patterns for woven beadwork. In this phase the indentations were of varying sorts, producing an agreeable art object. The patterns that appear in such transparencies are geometrical and conventional, but include life forms and some representations of tipis and houses. Such are the "pictures" that were admired, kept, or exchanged among members of the tribe. Those intended as suggestions for patterns in woven beadwork were purposely adapted for their special use as knee bands, headbands, etc. The second branch of the art is clearly related to the period in which the delicacy of the old percetion was passing away. Thicker bark was used, the outline of a leaf or flower was sharply indented and the pattern cut out, after which it was fastened to cloth and outlined in beads." (211-392)

HISTORY & BELIEFS:

HISTORICAL RECORDS:

- 1939 Oliver Perry Medsger, Edible Wild Plants, pg 205. "It is claimed that in 1861, after the battle of Carricks Ford, the edible bark of Black Birch probably saved the lives of hundreds of Garnett's Confederate soldiers during their retreat over the mountains to Monterey, Virgina. For a number of years after that, the route the soldiers took could be traced by the peeled birch trees." (7-205, 204-157)

- 1977 Francesco Bianchini & Francesco Corbetta, Health Plants of the World, pg. 160. "The Birch (Betula alba)...Pliny (c. AD 23-79) claimed that the books of Numa Pompilius which were buried with their author in 700 B.C., had been written on birch wood." (90-160)

- 1989 Janice J. Schofield, Discovering Wild Plants, pg. 64. "Roman soldiers once carried an ax encased in a birch rod bundle to symbolize the state's power to flog the unruly with their birch branches, or end their lives with an ax." (444-64)

SPIRITUAL BELIEFS:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 381. "The birch and the cedar were regarded as "sacred" by the Chippewa. The two reasons for this "sacredness" are closely connected. One is the great usefulness of these trees to the Chippewa and the other is the great usefulness of these trees to the Chippewa and the other is their connection with Winabojo, yet these two reasons are really one, for everything that is a benefit to the tribe is traced to Winabojo, the mythical character who, it is said, taught the Chippewa to live in their natural environment and yet, by his apparently witless actions, gave them an endless supply of humor." (211-381)

- 1977 Brendan Lehane, The Power of Plants, pg. 237. "Christ: The rose of Jerico, or rose of Mary, first blossomed at Christ's birth. It closed its petals at the Crucifixion and reopened them at the Resurrection. Cedar, cypress, palm, and olive made up the Cross. The crown of thorns was of holly and briar. The Dwarf Birch was stunted because it formed the scourge of Christ. But he blessed the palm for all time because it once bent to offer its fruits to his mother." (121-237)

- 1977 Brendan Lehane, The Power of Plants, pg. 184. "The central support of the shaman's tent was a birch tree, reputed protection against witches (121-184)...Benevolent in many legends, traditionally feared by boys as a means of punishment, the birch (above) supposedly provided the broomstick on which witches flew to the sabbat meetings." (121-186)

- 1977 Francesco Bianchini & Francesco Corbetta, Health Plants of the World, pg. 160. "The Birch (Betula alba) symbolizes good fortune and kindness, and the return of spring." (90-160)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 211. "In the Siberian and Altaic cultures, wherever the birch grows it plays an exalted role...The tall Siberian birch with its delicate dancing foliage and its dazzling white bark is a thing of ethereal beauty, and this alone is enough to give it a favored place in the affections of the Russians. But beyond the Urals it enlisted more than the affections of the tribesmen: it is the nodal point for their shamanism, for their beliefs about the supernatural. All or almost all of the serious writers about these cultures speak of the conspicuous place of the birch in their practices and thoughts. Yet not one of them links that special place with the fly-agaric. Not one of them perceives why the birch is the Tree of Life." (208-212)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 214. "..among the Buriat northwest of Lake Baikal the inhabitants bow morning and evening to two birches that they have planted in front of their huts. We read that the birch with seven or eight or nine branches is favoured, these symbolizing the successive gradations in ascending to the ultimate heaven; and it is held that the tree's roots penetrate to the very depths of the earth. As though to symbolize the reach upwards and the reach downwards, an eagel (or a mythological bird that we conventionally call an eagle) surmounts the tree and a serpent dwells at its roots. Again we read that the shaman selects a stout birch, fells it, and places it in the center of the yurt that he is going to build for his performance. He cuts seven or eight or nine notches in it, representing the seven or eight or nine heavens through which he will ascend. Later in the course of his ecstatic performance he climbs this tree making use of the steps, and passes through the hole in the roof through which the smoke from the fire finds its way, going on his symbolic journey to the other world." (208-214)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 220. "In the opening chapters of Genesis we are faced with the conflation, clumsily executed of two recensions of the fable of the Garden of Eden. The Tree of Life and the Tree of the Knowledge of Good and Evil are both planted in the

center of Paradise. They figure as two trees but they stem back to the same archetype. They are two names of one tree. The Fruit of the Tree is the fly-agaric harboured by the birch. The Serpent is the very same creature that we saw in Siberia dwelling in the roots of the Tree." (208-220)

NOMENCLATURE:

- 1931 M. Grieve, A Modern Herbal, pg. 103 (B. alba L.). "The name is a very ancient one, probably derived from the Sanscrit bhurga, 'a tree whose bark is used for writing upon.' From its uses in boat-building and roofing it is also connected with the Anglo-Saxon beorgan, 'to protect or shelter.'" (141-103)

- 1979 Nelson Coon, Using Plants For Healing, pg. 76. [Betula lenta]. "It is said that birch is derived from the ancient Sanskrit bhurga, meaning "that which is written upon." (134-76)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 214. "Certainly the overt vocabulary relating to the birch and the fly-agaric carried great prestige over millennia throughout the south and east of Asia: the Tree of Life, the Pillar of the World, the Cosmic Tree, the Axis of the World, the Tree of the Knowledge of Good and Evil - all these were variations stemming back to the birch and the fly-agaric of the northern forests." (208-220)

RELATIONSHIP TO OTHER LIFE-FORMS:

- 1931 M. Grieve, A Modern Herbal, pg. 104, (B. nana). "Smooth Dwarf Birch, rarely grows above 3 feet in height. The seeds are a principal food of the ptarmigan in Lapland." (141-104)

- 1951 A. Martin, Herbert Zim & A. Nelson, American Wildlife & Plants A Guide To Wildlife Food Habits, pg. 305. "The wildlife importance of birches, though considerable, is confined largely to the North and to northern animals. Prominent among the northern users are the sharp-tailed, spruce, and ruffed

grouse (feeding on catkins, buds, and seeds), the redpoll and pine siskin (seeds), and browsing or wood-eating mammals such as the moose, snowshoe or varying hares, porcupine, and beaver. The river birch though common throughout the Southeast has very little recognized value for any wildlife." (336-305)

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 117. "Birch seeds are eaten by birds; the buds are an important winter food of grouse and other large birds. Deer, moose, and rabbits browse the twigs in winter, and beaver use the inner bark for food when poplars (aspen) are not available."

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 118. "Betula lutea Michx.f.: The seeds of yellow birch and also sweet birch are probably more important as late winter food for birds than those of the white and gray birches, because the cones of the latter fall to pieces within a few weeks after they ripen in the fall whereas those of yellow and sweet birch disintegrate slowly throughout the winter, meantime releasing their seeds which come to rest on top of the snow blanket where they are available. In late March after a windstorm, numerous seeds have been seen cast in this way, and the presence of bird tracks indicated the use of these seeds for food." (71-120)

- 1977 Stephen F. Arno and Ramona P. Hammerly, Northwest Trees, pg. 168. "If more than a century passes without disturbance such as logging, fire, or a massive blow down, paper birch will be over-topped and crowded out by the longer-lived and more shade-tolerant conifers or even by black cottonwood. Through the ages, wildfire has served as both the killer and the perpetuator of paper birch." (259-168)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 212. "The fly-agaric [Amanita muscaria] lives in mycorrhizal intimacy with the birch, expecially the birch; sometimes with the pine, occasionally with the fir. Moreover, while Fomes fomentarius grows on several kinds of trees, it is

popularly associated with the birch because the birch is the most common of its hosts. Fomes fomentarius is the shelf fungus, often reaching huge size, that has always supplied the north Eurasian tribesmen with punk or touchwood, the primary tinder that catches the spark from the fire-drill and bursts into flame." (208-212)

INSECT AND OTHER PESTS:

- 1957 William M. Harlow, Trees of the Eastern and Central United States and Canada, pg. 129. "Betula pendula Roth: In some localities, the European form has not proved satisfactory because of its susceptibility to the attacks of the bronze birch borer whose larvae riddle the trunk." (71-129)

- 1990 Alan Mitchell, Trees, Canadian Nature Guides, pg. 24. "B. papyrifera: In New England, NY, ON, into OH, and PN most trees are damaged by the Bronze Birch Borer and have lost the main stem above 6-8 ft; they grow big, upturned lower branches." (441-24)

- 1981 Robert Michael Pyle, The Audubon Society Field Guide to North American Butterflies.

- Dreamy Duskywing (Erynnis icelus)...Mature caterpillar light green, speckled with white beneath short, profuse hair; black head may have red, yellow, or orange patterning. Caterpillar overwinters. Chrysalis dark green or brownish. (pg. 748)

- White Admiral (Basilarchia arthemis)....Caterpillar mottled off-white, olive, and greenish-yellow, with enlarged, light hump behind head; has long, dark bristles. Chrysalis cream-colored with enlarged wing cases and a darker projecting mid-back "saddle horn." (pg 635)

- Faunus Anglewing (Polygonia faunus)...Solitary caterpillar, to 1 1/4", tan with whitish patches and spines; feeds on birch. (pg. 613)

- Common Tortoiseshell (Nymphalis vau-album)....Caterpillar pale green, chartreuse-speckled with branched black spines; feeds communally on birches. (pg. 619)

- Tiger Swallowtail (Pterourus glaucus)...Young caterpillar brown and white, resembling bird droppings; mature caterpiller, to 2", is green, swollen in front, with big, false, orange and black eyespots and band between 3rd and 4th segments. Mottled green or brown sticklike chrysalis, to 1.25", overwinters. Great variety of host plants, includes birch...pg. 340. (153-340)

- 1989 Hugh Philip and Ernest Mengersen, Insect Pests of the Prairies, University of Alberta, pg. 117. The following insects are listed as being harmful to Birches. The description, history, damage and prevention techniques on each insect is described in detail: (445-49)

Ambermarked birch leafminer sawflies [Profenusa thomsoni (Konow)] (445-57)
Birch leafminer [Fenusa pusilla (Lepeietier)] (445-57)
Bronze birch borer [Agrilus anxius (Gory)] (445-49)
Forest tent caterpillar [Malacosoma disstria (Hubner)] (445-65)
Late birch leaf edgeminer [Heterarthrus nemoratus (Fallen)] (445-57)
Linden looper [Erannis tiliaria tiliaria (Harris)] (445-68)
Mourningcloak butterfly [Nymphalis antiopa (Linnaeus)] (445-69)
Poplar-and-willow borer [Cryptorhynchus lapathi (Linnaeus)] (445-53)

AGE:

- 1985 Eleanor Lawrence, The Illustrated Book of Trees & Shrubs, pg. 134. "The genus Betula includes some 120 existing species and about 40 more that are now extinct. Birches were distributed throughout the northern hemisphere, particularly in Asia, from the Palaeocene. Even today, birches grow only in the northern hemisphere." (403-134)

STORIES:

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 381.

Legend of Winabojo and the Birch Tree

There was once an old woman living all alone on the shore of Lake Superior. She had a little girl living with her whom she called her daughter, though she did not know exactly where the child came from. They were very poor and the little girl went into the woods and dug wild potatoes or gathered rose berries for them to eat. The little girl grew up to be a woman, but she kept on doing the same work, getting potatoes and berries and picking up fish that were washed ashore. One day when doing this she had a strange feeling as though the wind were blowing underneath her clothing. She looked around her but saw no signs of anyone. After a while she went home.

As soon as she entered the house her mother saw that she looked troubled and bewildered. Her mother asked, "Did you see anyone? Did anyone speak to you?" The girl replied, "I saw no one and heard no one speak to me." After a time the mother noticed that the girl was pregnant and questioned her again but the girl replied as before, that she had seen no one. The only thing strange to her was the sensation of the wind blowing about her which she had described to her mother. When the time came for her to be delivered there was a sound as of an explosion and the girl disappeared, leaving absolutely no trace. The old woman threw herself on the ground and wailed because her daughter had disappeared. She searched everywhere but could find no trace of her. Finally, in looking among the leaves, she saw a drop of blood on a leaf. She picked it up carefully and put it beside her pillow. After a while, as she lay there, she thought she heard some one shivering and breathing near her head. She lay still, now

knowning
what to do. She heard the breathing near. She lay still, not knowing what to do. She heard the breathing near her
head constantly. As she lay there wondering what it could be she heard a sound like that of a human being. She said, "I guess I am going to be blessed." As she lay there a voice spoke and said, "Grandmother, get up and build a
fire. I am freezing." The old woman arose and looked around, and there beside her lay a little boy. She took him
up and caressed him. She got up and made a fire to warm him, and behold the child was Winabojo. All the spirits that roam the earth were frightened at the birth of Winabojo, for they knew his power. Throughout his human life he
was a mysterious being with miraculous powers. He grew rapidly in strength and soon began to help his grandmother.
He dug potatoes and brought fish and berries for her.

One day, when he had grown to be almost a man, he asked his grandmother what was the largest fish in the lake. She replied, "Why do you ask? It is not good for you to know. There is a large fish that lives over by that ledge
of rock, but it is very powerful and would do great harm to you." Winabojo asked, "Could the great fish be killed?"
His grandmother replied, "No; for he lives below the rocks and no one could get down there to kill him."

Winabojo began to think about this and he made up his mind that he would learn to fight so that he could kill the
great fish. He got some wood and began to make bows and arrows. Then he asked his grandmother if she knew of any bird whose feathers he could put on the arrows to make them effective. The old woman replied "No. The only bird whose feathers would make the arrows effective is a bird that lives in the sky, at the opening of the clouds. On would have to go up there to get the feathers." Winabojo began to think how he could go up there and get the feathers that he was determined to have. At last he said to himself, "There is a high cliff on the edge of the lake. I will go up there and stay a while."

When he reached the high cliff he wished that he might change into a little rabbit. So he became a little rabbit
and lived there. One day he went on a very high part of the cliff and called to a big bird, saying, "Eagle, come

here. I am a cunning little animal. I would be a nice plaything for your children." The bird flew down and saw the little rabbit playing there. The rabbit was the cunningest thing he had ever seen. The big bird was the thunderbird and he alighted on the top of the high cliff, near the little rabbit. Finally he took the little rabbit
and flew up, up toward the opening in the sky.

When the thunderbird came to his nest he called to his children, "I have brought you something very cunning to play with." His wife spoke to him very crossly and said, "Why did you bring that rabbit up here? Have you not heard that Winabojo is on the earth? There is no knowing what you have picked up." But the little rabbit was very
meek and quiet, letting the children play with him as they liked. The big birds were seldom at home as they went away to get food for their children.

All at once, one day, Winabojo began to talk to himself and he said, "These children throw me around as though I
was nothing. Don't they know I came here to get some of their feathers?" The next time the old birds went away he
changed into his human form, took a club, killed the little thunderbirds and pulled off their feathers. He hurried
around and tied the feathers up in bundles for he was sure the old birds would soon be home. When all was ready he
jumped off. He was not killed because he was a manido (spirit) and nothing could hurt him. He was unconscious for
a time after he fell on the earth but he was not hurt. Soon there was a great roaring in the sky with flashes of lightning. The thunderbirds were coming after him. Winabojo jumped up when he saw the flashes of lightning and heard the thunder. The lightning was the flash of the thunderbird's eyes and the roaring was their terrible voices.
He snatched up the bundles of feathers and ran for his life. Wherever he went the flashes and the roaring followed
him, but he held on to the feathers. He had gotten what he wanted and he did not intend to lose them. The thunderbirds kept after him and at last he felt that they were tiring him out. He began to fear that he would be killed after all. The thunderbirds came so close that they almost grasped him with their claws. He was getting bewildered. They were almost upon him when he saw an old, fallen birch tree that was hollow. He crept into the hollow just in time to save his life. As he got in the thunderbirds almost had their claws on him.

The thunderbirds said, "Winabojo, you have chosen the right protection. You have fled to a king-child." There they stopped. They could not touch him for the birch tree was their own child and he fled to it for protection. There he lay while the thunder rolled away and the flashes of the thunderbird's eyes grew less bright. He was safe.

When the thunderbirds had gone away Winabojo came out of the hollow birch tree and said, "As long as the world stands this tree will be a protection and benefit to the human race. If they want to preserve anything they must wrap it in birch bark and it will not decay. The bark of this tree will be useful in many ways, and when people want to take the bark from the tree they must offer tobacco to express their gratitude." So Winabojo blessed the birch tree to the good of the human race. Then he went home, fixed his arrows with the feathers of the little thunderbirds and killed the great fish.

Because of all this a birch tree is never struck by lightning and people can safely stand under its branches during a storm. The bark is the last part of the tree to decay, keeping its form after the wood has disintegrated,
as it did in the tree that sheltered Winabojo.

The little short marks on birch bark were made by Winabojo but the "pictures" on the bark are pictures of little
thunderbirds. It was said that the bark in some localities contains more distinct pictures of the little thunderbirds than in others." (211-384)

- 1982 R. Gordon Wasson, Soma: Divine Mushroom of Immortality, pg 214. "Uno Holmberg in the 'Mythology of All Races' summarizes the Siberian myths about the birch in his chapter on the Tree of Life.

> The spirit of the birch is a middle-aged woman who sometimes appears from the roots or the trunk of the tree in response to the prayers of her devotees. She emerges to the waist, her eyes are grave, she has flowing locks, her bosom is bare, and her breasts are swelling. She offers milk to the Youth who approaches her. Her drinks and his strength grows a hundred-fold. This myth, which is repeated in myriad variations, clearly refers to the fly-agaric." (208-214)

- 1928 Frances Densmore, Use of Plants by the Chippewa Indians, pg. 395. "The

following story is related concerning the custom of making birch-bark transparencies:

There was once a man who lived with his parents. At sugar-making time he noticed that they were getting old and the work was hard for them, so he bought home a wife to help them. The family were in the sugar camp and he sent his wife to get some birch bark for making dishes as the other women did. She took an ax and was gone all day. When she came home at night she had a great bundle of bark on her back. This make him glad, for he thought she had been very industrious. She opened her bundle and said, "See what I have been doing all day." Then she showed him quantities of patterns and pictures bitten in birch bark. Her bundle was full of them. She had been biting patterns all day instead of making dishes. The man was so ashamed that he hung his head and died. He could not bear to have people know that he had brought home such a good-for-nothing wife." (211-396)

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<<WARNING>>

The information in these articles is primarily for reference and education. They are not intended to be a substitute for the advice of a physician. The instructor does not advocate self-diagnosis or self-medication; He urges anyone with continuing symptoms, however minor, to seek medical advice. The reader should be aware that any plant substance, whether used as food

or medicine, externally or internally, may cause an allergic reaction in some people.

Maurice L.B. Oates Jr., M.A.
(Ya'-ga-hlo'o)