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The Flora of Star Island and Vicinity

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It was my privilege during the latter part of July and early August to spend a week with the forestry students of Iowa State College on Star Island to give a few lectures on the flora of the region. I desire to express my appreciation of the kindness shown me by the forestry students while in camp and for some specimens. Nearly all of the students contributed in one way or another plants of some kind. I am under great obligations to Profs. MacDonald and Morbeck as well as to Mr. Marshall, the forest supervisor and to Miss Rasmussen for many additional favors; to Mr. C. R. Ball for the identification of the willows; to Mr. R. I. Cratty for the identification of species of the genus Carex, and to Dr. Robinson for the determination of the oaks. In addition to the above collectors most of the plants were collected by P. S. McNutt, my son, Harold, and myself. Professor MacDonald furnished me with the photographs. Mr. Bode and Mr. Geisler made a map of the Island showing the main characteristics of the flora. The list of plants is by no means complete. We made a hasty survey of the region of Star Island, Cedar Island and in the vicinity of Cass Lake. The early vernal plants had all disappeared.

LITERATURE OF THE REGION

Star Island and its vicinity is connected with some of the early history of Minnesota. One David Thompson came to this region in 1798. Cass Lake was the traders' route from the Red River country to the settled portions of the United States farther east. Zebulon Montgomery Pike found a man by the name of Roy in the Northwest Company house on the east or left bank of Cass Lake, February 12, 1806. Governor Cass and Henry Schoolcraft were at the same point in 1820. Beltrami was here in 1823 and Nicollet, the only geographer of the early day, was here in 1836. Of all the early accounts of the region the one of greatest interest centers in the Pike expedition. We cannot follow Pike the entire journey. Pike tells us he left Lake La Sang Sue, now

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1These are the two prominent islands in Cass Lake, a number of smaller islands occur in Allen Bay region off from the northwest point of Star Island.
Leech Lake, at 2:30 o’clock for Lake Winipe (Winnibigoshish). He thought Leech Lake was the main source of the Mississippi river. Cass Lake region was considered to be the upper source. The discovery that the water of this lake discharges into the Mississippi river by way of Leech river and is not one of the sources of the Mississippi was made later. The party arrived at the (upper) Red Cedar Lake, now known as Cass Lake at the establishment of the Northwest Company house on Cass Lake, on February 12, 1806. During Pike’s expedition French names had been applied to many of points of interest in the region, this lake was known as Haut Lac aux Cedres Rouges or the Upper Cedar Lake to distinguish it from another Cedar Lake further down the Mississippi near Atkin. These lakes were both so named because of the abundance of red cedar (*Junciura virginiana*). In the immediate vicinity of Cass Lake the red cedar is abundant only on Cedar Island. It is curious how few names Pike gave to points of interest in the region. Pike’s name is commemorated in Pike’s Bay which connects with Cass Lake by a short stream. It is strange that not more names commemorating Pike occur in the region. Cass Lake honors the memory of the famous General Lewis Cass, who with Schoolcraft, explored this region some years after Pike did. Schoolcraft called the lake Cassina or Cassiant Lake, later changing it to Cass Lake. Long’s map of 1823 uses the name Cass Lake.

Star Island has gone by the name of Colocaspi or Grand. This is a curious name which was given to the island by Schoolcraft from the names of three explorers, Cass, Schoolcraft and Pike.

Brower in 1894 named the island Ozawindib or Yellow Head. This was the name of the Chippeway Indian chief when Schoolcraft visited the place on July 10 and 15. He camped on one of the anvils of the island, according to Coues. The place has been quite famous ever since. The anvil of the island where Chippewa village of Ozawindib lies and where Schoolcraft camped on the northeast point of the island connects with a shoal to the northward. I was on the point. Mr. Cassidy, who rowed around the island, tells me that the bottom of the lake near this point is quite stony.

The island is connected with a shallow bank in the lake to the mainland. The shallow place was, no doubt, raised above the water during the summer. The government dam has raised the water so that now it is generally covered during the year. At any rate this general region has been much used by trading parties and explorers.

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1. The expedition of Zebulon Montgomery Pike to the headwaters of the Mississippi River, through Louisiana Territory and in New Spain during the years 1805-6-7. New edition by Elliott Coues, 3 volumes. New York, Francis Harper, 1893. Volume 1 contains the Mississippi voyage and a memoir by Coues. It is a most interesting volume especially in the details it gives of the region. Both this work and the Lewis and Clark edition by Coues are splendid monographic historical works. Coues went over the entire region and followed closely only as a keen observer can every land-mark of the region.
2. The Pike map gives the position of Leech Lake and Cass Lake as well as the N. W. Co. House.
3. Pike was modest in bestowing names. Schoolcraft named places very freely.
Fig. 1—Map of Cass Lake region. The town of Cass Lake, Star and Cedar Islands, Allen’s Bay, Pike’s Bay. Redrawn by Mr. Geisler
I. N. Nicollet, sometimes referred to as Professor Nicollet, was the only early real geographer who explored the upper Mississippi and prepared an excellent map of the region. Allen was one of the Schoolcraft party and to him also belongs much credit for the success of the Schoolcraft expedition, especially from the standpoint of the discovery of the source of the Mississippi. Coues says:

James Allen's name is not so well known in this connection as it should be. That is to say, the public seldom connects his name with the discovery of Lake Itasca. But if Mr. Schoolcraft was the actual head of the expedition of 1832, and became its best known historian, Lieutenant Allen was a large and shapely portion of the body of that enterprise, decidedly the better observer, geographer, and cartographer; item, the commander of the military escort, which might have been necessary for safety and success; item, the author of an able, interesting, and important report upon the subject, which he made to the military authorities.

The same authority credits William Morrison as being the first white man to have visited Lake Itasca in 1804 and again in 1811 and 1812. Some doubts have been expressed as to this. Allen's Bay of Cass Lake is named after Lieutenant Allen.

The Schoolcraft party camped on the shores of Cass Lake and spent some time about Leech Lake and Bemidji, or as then known, Pemidiji. The change of names illustrates well how time influences the naming of places. The Nicollet expedition occurred in 1836. The Schoolcraft expedition was made four years earlier.

Speaking of Cass Lake or Lake Cassina, Schoolcraft says: "Its banks are overshadowed by elm, maple and pine along the margin. There are many fields of Indian rice, rushes and reeds, there is an open beach of clean pebbles driven by the waves, but no rock strata appear. It has an island towards the western extremity from which it derives its local name but no red cedar is found around its shores."

The name of the lake referred to by Schoolcraft as Lake Cassina was known as Upper Red Cedar Lake in Pike's time. The island pictured on the map by Schoolcraft no doubt is what is now known as Star Island. There are only a few red cedars on this island and while the trees are mature the age could not be determined.

A few red cedar trees on Star Island might easily have been overlooked by Schoolcraft but they could not have been overlooked on Cedar Island where they are abundant. It is probable that Schoolcraft did not visit Cedar Island.

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*Report intended to illustrate a map of the hydrographical basin of the Upper Mississippi Basin, House of Representatives 25th Congress, 2d Session, Document No. 52, Jan. 1, 1845, see p. 61.

*J. C. 1: 332.


*There has been much controversy over the source of the Mississippi. Prof. J. E. Todd (The Geol. and Nat. Hist. Survey of Minn., 4: 135) discusses the sources of the Mississippi from the evidence obtained by J. V. Brower (Minn. Hist. Soc. Coll. 7), Levasseur (Minn. Hist. Soc. Coll. 8), Winchell (Min. Hist. Soc. Coll. 8: 256). Todd says if Lake Itasca be not allowed as the source of the Mississippi then the competition lies between Nicollet and Excelsior Creeks, the former according to Todd having the greater volume and length.
Jack Pine (Pinus divaricata) on Star Island. Photographed by Prof. G. B. MacDonald
Beltrami, an Italian after whom the county of that name was named, was a member of Major Long's expedition. He descended Turtle River which flows into Cass Lake. This explorer published a book of travels which deserves more merit than is usually bestowed on it by earlier writers. He seems to have been a self-centered, egotistical man.

The Minnesota Geological survey also published a history of the region. Mr. Brower expresses some doubt about the English astronomer, David Thompson, being at Itasca Lake in 1812. In 1797 this astronomer made a journey from the north shore of Lake Superior to the mouth of the Assinibola and Pembina Rivers. That William Morrison has some claim as the original discoverer of the source of the Mississippi River was stated in a letter written to his brother, Allan, in 1866.

Thompson's explanations are given in Upham's Minnesota in three centuries.

The Cass and Schoolcraft expeditions of 1820 decided that the real source of the Mississippi was Lac la Biche or Elk Lake named by Schoolcraft as Lake Itasca. The source of the river was discovered by Schoolcraft in 1832. The name had its origin from the pointed expressions furnished by the Rev. Boutwell "Veritas" truth and "Caput" head. Schoolcraft struck out "Ver" and "put" making the two parts of word read Itasca.

GEOLGY OF THE REGION

The geology of the region has been discussed by Upham and Todd. The material on the island is drift made up of sand with a light covering of humus. In a few places, notably along the southwestern shore, there are outcrops of a clay. Quite a large number of swamps occur, these are all of recent origin. There are also a number of lakes, the largest, Lake Helen, covers about 200 acres. There is a considerable depression between Lake Helen and the west shore of Cass Lake, and possibly at one time there were two small islands.

Star Island is partly in Cass and partly in Beltrami county, most of it in the latter. The south shore of Lake Helen is on the northern boundary of Cass county. The camp was located in Cass county.

TOPOGRAPHY AND AREA OF THE ISLAND

Star Island is about two and a quarter miles from the town of Cass Lake in Cass county, Minnesota, and is now embraced in the

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8The Geology of Minnesota 1: 25-78.
10Thompson connection is referred to in Minnesota in three centuries 1655-1908, 1: 296. The Morrison brothers 1 c. 316. Pike's connection with the exploration is given 1 c. 326. Upham gives a short account of the two Schoolcraft Expeditions, 1. c. 349.
11The geology of Cass county and of the part of Crow Wing county northwest of the Mississippi River. Geology of Minnesota, 4: 55-81, pl. 59 f. 8.
12The geology of Hubbard county and northwestern portion of Cass county, 1 c. 4: 62-97 pl. 89. The geology of Beltrami county 1 c. 4: 181-186 pl. 84. xv. pl. 1 M. K. f. 11, 12, 13, 14, 15.
Fig. 2—Distribution of trees on Star Island. Made by the class in Silviculture.
Red or Norway Pine (Pinus resinosa) on Star Island.
Photographed by Prof. G. B. MacDonald.
Minnesota national forest reserve. The island gets its name from the points that run out into Cass Lake. The southwest point has rather steep banks. The southeast point has a gentle slope connecting with a shallow part of the lake to Cedar Island. The other points are flat, raised but little above the surface of the lake, more or less marshy. Star Island comprises an area of 1,200 acres, somewhat uneven. The soil is more or less sandy except the low marshes which border the small lakes or Cass Lake beyond the outer beach. Cass Lake is a beautiful lake, the third largest in the drainage area of the Mississippi river exceeded only by Winnibigoshish and Leech, the greatest length is 9½ miles including Pike's Bay, the greatest breadth is 7½ miles, including Allen's Bay.

BOTANY OF THE REGION

The plants of the region, especially the trees, are referred to by Upham and Todd.14 Upham mentions the swamp oak (Quercus palustris). This certainly does not occur in the region, at least in the vicinity of Cass Lake. The other trees check up well. Schoolcraft also mentions some of the trees without botanical names.

The handsomely illustrated Minnesota Trees and Shrubs of F. C. Clements, C. O. Roedenthal and F. K. Butter15 covers the region. Warren Upham's splendid catalogue of the Flora of Minnesota in a general way covers the region, also MacMillan's Metaspermae of the Minnesota Valley.16

TREES OF THE ISLAND

The dominant trees are the Norway pine (Pinus resinosa) of which many of the virgin trees still remain, the largest one found by the class in forestry was 3 feet in diameter and a height of about 130 feet. There are also many virgin white pines (Pinus Strobus). The largest one was about 46 inches in diameter and about 140 feet high. The Jack pine (Pinus divaricata) is the third dominant conifer. The paper birch (Betula papyrifera), the red maple (Acer rubrum) are other common trees. The box elder is not common, occurs with other deciduous trees near the shore line of the lake. Of the other broad-leaved species the burr oak (Quercus macrocarpa) and the red oak (Quercus rubra) are not uncommon. Possibly also some scarlet oak. This also occurs commonly on the mainland. There are a few old cottonwoods (Populus deltoides) on the shores of the island. Virgin but not large trees of the hard maple (Acer saccharum) occur in numerous places on the Island. The American elm (Ulmus americana) is much more common than the slippery elm (Ulmus fulva) and the large-toothed aspen (Populus grandidentata). The balsam poplar (Populus balsamifera) is common. The basswood (Tilia americana) is fairly common. The hackberry (Celtis occidentalis) and the yellow birch

TABLE SHOWING THE DISTRIBUTION OF TREES ON THE ISLAND COMPARED WITH OTHER REGIONS

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<th>Species</th>
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<th>Wis.</th>
<th>Max.</th>
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*The character 0 denotes absence of the species.
†The character P denotes presence of the species.
A FEW ECOLOGICAL NOTES

I shall not attempt to discuss the ecology of the region, though it is of great interest and might well be made the subject of a paper. Star and Cedar Islands, though adjacent, show some marked deviations in their respective floras, thus for instance, the abundance of red cedar on Cedar Island and its scarcity on Star Island is noteworthy. The occurrence of the balsam fir with the red cedar and on steep slopes is of interest. Again the abundance of the Black Ash in the low flat swamp on the margin of the island is another interesting feature of Cedar Island. The shallow water everywhere contains an abundance of the wild rice (Zizania palustris) and rush (Scirpus validus). This extends, especially between Star and Cedar Islands, long distances into the lake where the water is shallow. The shallow portions of the lakes also contain several species of pond weeds (Potamogeton). The white water lily (Cannatia tuberosa) is common along the shores and bays in shallow water. The little stretches of swampy prairies on the mainland contain the beautiful fringed orchis (Habenaria pycodes) and the swamp thistle (Cirsium muticum) and the sage willow (Salix candida).

In another paragraph the statement was made that the island consists mostly of sandy drift material. Much of this was left here during the glacial period. The topography is quite broken, low areas vary greatly, in some cases swamps and bogs depending on the distance from the water level of the lake; in others the land sufficiently high with good drainage and hence wet only early in the spring. Much of the island is covered with coniferous trees, in other parts mainly deciduous trees and shrubs. On the borders of the swamps an abundance of red maple, alder, etc. The blueberry (Vaccinium pennsylvanicum), the bearberry (Arctostaphylos uva-ursi), the wintergreen (Gaultheria procumbens), Maianthemum canadense, Clintonia borealis, the yellow flowered vetch (Lathyrus ochroleucus), Spiranthes and Habenaria are found. The club moss (Lycopodium obscurum var. dendroides) is common in some places in Norway pine woods. Considerable areas in dry pine woods are covered by another club moss, the Lycopodium complanatum var. flabelliforme. The Lycopodium inundatum occurs in low grounds under the shade of the balsam fir. The common red raspberry (Rubus idaeus var. acutilatissimus) is common in low grounds, banks and shores or in areas burned by fire where there is plenty of sunshine. The large flowered aster (Aster macrophyllus) is the most common aster in woods. Small dogwood (Cornus canadensis), the staghorn sumach (Rhus typhina) and the beaked hazel (Corylus rostrata) as well as the dwarf honeysuckle (Diervilla trifida) and honey-suckle (Lonicera canadensis) is common in woods with deciduous trees and shrubs.

In a few places where the timber has been burned there is much fireweed (Epilobium angustifolium) and the bristy sarsaparilla (Aralia hispida).
On Norway Bluff with a small opening-like prairie there is an abundance of the licorice (Glycyrrhiza lepidota), the smooth aster (Aster laevis) and small blue joint grass (Andropogon scoparius) and Festuca octoflora. Throughout the timber one finds a great deal of Salix humilis.

Swamps and peat bogs are not uncommon on the island. In these there is a zonal distribution of plants. The outer zone is made up of blue joint grass (Calamagrostis canadensis) followed by sedges, leather leaf (Chamaedaphne calyculata), cranberry (Vaccinium glaucum), Andromeda Polifolia and Labrador tea (Ledum groenlandicum) with scattered black spruce (Picea canadensis), larch (Larix laricina) and the myrtle-leaved willow (Salix pedicellata). On the border where drainage is a little better the beaked willow (Salix rostrata) occurs and (Salix petiolaris), the red osier or dogwood (Cornus stolonifera), the speckled alder (Alnus incana) and the Salix discolor.

The red ash (Fraxinus pennsylvanica) occurs in swamps with the alder and the red ash. The beaches are fringed with the alder, the red raspberry, dogwood, the sand bar willow and less frequently the shining willow (Salix lucida). The balsam poplar (Populus balsamifera) is a beach tree although found away from shores especially in swamps. The sandbar willow is not uncommon, the peach-leaved or almond-leaved willow is not common. Deciduous trees like the paper birch and red maple are quite generally distributed over the island with other deciduous trees like the oak and basswood. The hard maple and basswood are associated with the blood-root, Trillium and Aralisema.

INTRODUCED PLANTS ON THE ISLAND

The number of introduced plants on Star Island is small indeed. The Canada thistle and bull thistle on the beaches; the red clover, white clover, timothy and alfalfa near the cottages and hotel; lamb’s quarters, horseweed, bluegrass and Anthemis cotula near the hotel. One might expect to find the horseweeds where the fire destroyed the timber but the most important plant here was the fireweed. It would appear that the virgin forest is a barrier against the spread of Canada thistle and its occurrence on the beaches is due to the transport by water.

PLANT FORMATIONS NEAR LAKE HELEN

The following plants occurred in bogs, shore line and in the coniferous forests near the lake. The numbers refer to plats in figure 3:

In water: Alder (Alnus nepalensis); Rush (Juncus subterraneus); Potamogeton sp.; Smartweed (Polygonum amphibium).

Shore Line, from 5-6 feet: Lobelia (Lobelia Kalmii); Cowhane (Centaurea bulkifera); three species of Carex; Reed grass (Phragmites communis); Aster; Greater lobelia (Lobelia intermedia); Meadow grass (Poa serotina); Water reed (Phalaris arundinacea); Rush (Juncus maritimus); White Violet (Viola blanda); Wild rye (Elymus canadensis); Peppermint (Mentha arvensis); Solidago sp.

First Rise from Shore: Fire weed (Epilobium spleenatum); Sedge (Juncus ilicinaceus); Hair grass (Agrostis stolonifera); Blue joint (Calamagrostis canadensis); Horsetail (Equisetum sylvaticum); Alder (Alnus incana); Paper Birch (Betula papyrifera); Red raspberry (Rubus strigosus var.); Spruce (Picea canadensis); Choke cherry
A peat bog with Tamarack and Black Spruce forming an island on Star Island.
A peat bog with Tamarack and Black Spruce forming an island on Star Island.
(Prunus virginiana); Wild rose (Rosa canadensis); Service berry (Amelanchier canadensis); Dogwood (Cornus stolonifera); Poison ivy (Rhus toxicodendron); Pin cherry (Prunus pensylvanica); Red ash (Fraxinus pennsylvania); Green ash (Fraxinus pennsylvania var. lanceolata); Quaking aspen (Populus tremuloides); Swamp birch (Betula pumila); Red oak (Quercus rubra); White pine (Pinus strobus); Blue berry (Vaccinium pensylvanicum); Beaked hazel (Corylus rostrata); Mountain ash (Frusus americana); Bush honeysuckle (Diervilla Lonicera); Hucklberry (Gaylussacia baccata); Bear berry (Aronostaphylus ussuriensis); Red maple (Acer rubrum); Bar oak (Quercus macrocarpa); Swamp fern (Aspidium Thelypteris).

Plot I, 9 ft.—50 Rubus strigosus var.; 1 Acer rubrum; 1 Quercus rubra; 16 Diervilla Lonicera; 1 Corylus rostrata; 50 Vaccinium pensylvanicum; 5 Cornus canadensis; 3 Tridentalis americana; 32 Maianthemum canadense; 2 Clintonia borealis; 1 Maianthemum canadense; 2 Prunus pensylvanica; 1 Fire Weed (Eupatorium angustifolium); 3 Salth diiscolor; 50 Calamagrostis (in clump).

Plot II, on ridge, 9 ft.—37 Alnus; 1 Picea canadensis; 5 Corylus rostrata; 7 Aralia nudicaulis; 2 Pinus strobus; 4 Pyrus americana; 22 Clintonia borealis; 15 Gaylussacia; 5 Rose; 2 Rubus strigosus var.

Plot III, 9 ft.—3 Pinus strobus; 1 Acer spicatum; 50 Gaylussacia (estimate); 2 Betula papyrifera; 2 Pyrola rotundifolia; 6 Diervilla Lonicera; Maianthemum canadense (numerous); Cornus canadensis (numerous); Linnacea borealis (numerous); 2 Melampyrum lineare; 50 Clintonia borealis.

Plot IV, 9 ft.—54 Acer rubrum; 12 Aralia nudicaulis; Gaylussacia (numerous); Linnacea (numerous); Estonia pensylvanica (numerous); 2 Epilobium spicatum; 1 Amelanchier splendens; 1 Lonicera canadensis.

Plot V, 36 ft.—8 Abies balsamea; 50 Pinus strobus; 4 Acer rubrum; 52 Corylus rostrata; 1 Betula papyrifera; 3 Lonicera canadensis; 4 Pinus resinosa.

Plot VI, 9 ft.—3 clumps Viola canadensis; 3 clumps Pyrola rotundifolia; 3 Cornus stolonifera; 4 Cornus canadensis; 6 Tridentalis americana; 17 Rubus strigosus; 10 Melampyrum lineare; 5 Viola canadensis; Maianthemum canadense (numerous); Linnacea borealis (numerous); Moss (numerous).

Plot VII, 9 ft.—Salix discolor; Carex species; 1 Acer rubrum; 3 Rubus strigosus; 3 Alnus incana; 1 Diervilla Lonicera.

Plot VIII, swamp—Salix discolor; Alnus incana; Betula papyrifera; Fraxinus pensylvanica; var. lanceolata; Aspidium Thelypteris; Fern.

Plot IX, 9 ft.—5 Populus tremuloides; 2 Amelanchier spicata; 10 Corylus rostrata; 45 Arctostaphylus; 60 Lycopodium obscurem var. dendroides; 2 Acer spicatum; 5 Aralia nudicaulis; 2 Petas aquilina; 1 Abies balsamea; 7 Clintonia borealis; 10 Cornus canadensis; 3 Diervilla Lonicera; Linnacea borealis (numerous); Smilacina stellata (numerous).

Plot X, 36 ft.—13 Picea mariana; 4 Populus tremuloides; 1 Betula papyrifera; 5 Pinus strobus; 1 Quercus rubra; 2 Acer rubrum; 4 Pinus resinosa; 1 Abies balsamea; 50 Corylus rostrata; Arctostaphylus ussuriensis; Bearberry (numerous); Lycopodium complanatum var. flabelliforme (numerous).

PLANTS IN BOG

The plants listed below occurred in one of the smaller bogs, beginning from the center Zone I heath formation, Zone II water arum formation, Zone III blue joint formation (Calamagrostis) forming a distinct zone around the marsh. This is the most strongly marked area in the bog.

Zone I. Heath formation—Chamaedaphne calyculata (dominant); Sphagnum moss; Ledum groenlandicum; Betula pumila; Gaylussacia baccata; Picea canadensis (larger specimens dead); Larix laricina Tamarack; Hypnum moss; Fire weed (occasionally); Birch (occasionally).

Zone II.—Calla palustris; Hypnum moss.

Zone III.—Calamagrostis canadensis; Potentilla palustris; Alnus incana; Betula pumila; Picea canadensis.
Fig. 3—Ecological map on shore of Lake Helen. See page 128, under plant formations. (Geisler and Bode.)
PERCENTAGE DISTRIBUTION OF TREES AND SHRUBS ON THE ISLAND

<table>
<thead>
<tr>
<th>Name of Species</th>
<th>N. W. Point</th>
<th>Norway Pine</th>
<th>White Pine</th>
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<th>Mixed Clearing</th>
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LOWER FORMS OF PLANTS ON THE ISLAND

The island contains a good many of the lower forms of plants. Of lichens I collected Cladonia rangiferina, C. coccifera, and C. pyxidata var. chlorophaca; of mosses several species of Hypnum and Bryum occurred, the liverwort (Marchantia polymorpha) was common.

Many of the birch trees were attacked by Birch Bracket Fungus (Polystictus betulinus) but it was not nearly as common as the Fomes fomentarius which occurred everywhere on birch trees from 6 to 8 inches in diameter rapidly destroying the tree. The same species also occurred on the quaking aspen. There also occurred on the maples and birches the Polyspora hirsuta. The Chlorosplenium aequalis occurred on poplar. This fungus causes the greenish discoloration of wood.

A number of parasitic fungi also were found. Of these mention may be made of the Puccinia asteris on Aster macrophyllus readily detected because of the definite yellow spots on the upper surface of the leaf and the brown sorus on the lower. Black knot (Pisolithus morbosus) occurred on the choke cherry and the Fusidium pyrinum on the service berry where it produced witches brooms. The Ascidium Grossulariae on the wild gooseberry was not common. The Calyptraria geopertiana on Vaccinium pennsylvanicum was common; where it was found usually a large number of diseased plants occurred. The
Exobasidium vaccinii was common on Vaccinium pennsylvanicum, Goy-
usatia baccata and Chamaedaphne calyculata. The Exoascus api-
incanae was common on the cattail scales of Alnus incana easily recog-
nized by the elongated scales. Peridermium elatinum producing witches
brooms occurred on the balsam fir on Cedar Island. The writer also
saw but did not collect a Peridermium on Picea canadensis, this also
produced witches brooms.

The lichens and Hymenomycetes were identified by Mr. Wm. Diehl;
Polyergus gutus 655 and Daedalea uncicolor 671 verified by Mr. L. O.
Overholts. The following lichens were collected on Star Island:

Cladonia rangiferina (L) Web 744; C. coceifera (L) Willd. 645; C. pyxidata chloro-
phasea (Spregs) Fl. 646; Evernia prunastri (L) Ach. 647; Uannea barbera Fr. 648;
Parmelia caperata (L) Hoffm. 840, 650; P. boreal Turn. 651; Peltigera canina (L)
Hoffm. 652, 653; Physcia stellaris (L) Nyl 654; Psudea cerina (Hoffm.) Hoppe.
655; Buella parasema (Ach) Koerb 654; Hypomyces lactilorum Schw. on Lactarius
piperatus Fr. (? ) 657; Coleophora eruginosum (Oeder) Tul. 658.

The following Hymenomycetes were collected on Star Island:
Corticium cinereum Pers. 659; Fomes applanatus (Pers.) Wallr. 660; F. somenta-
tarisi (L) Gill 661; Polyporus betulinus (Bull.) Fr. 661; P. fuscus Pers. 663; P.
glutus (Schw.) Fr. 665; P. hirustus Wulf. 664; P. Pertecenus Fr. 102, 666; P. versi-
color (L) Fr. 667, 668, 669; Gloeoporus concinoides Mont. 670; Daedalea confragosa
(Bolt.) Fr. 671; D. uncicolor (Bull.) Fr. 673; Trametes pini (Thore) Fr. 674; Favolus
canadensis Klatzsch. 672.

The following fungi from Star Island, Minnesota, and its vicinity,
were identified by O. Schultz:
Claviceps purpurea Tul. on Secale cereale. 707; Fowrightia morbosa Sacc. on
Prunus virginiana, 797; Septoria smilacinae Ell. & Martin on Smilax stellata, 822;
Septoria smilacinae Ell. & Mar. on Smilax racemosa, 810; Aecidium Grossulariae
D. C. on Ribes cynoebatli, 644; Puccinia asteris Duby on Aster macrophyllum, 623;
Exaerus alni incanae Kuhn on Alnus incana, 645; Aecidium grossulariae D. C. on
Ribes cynoebatli, 644; Entyloma ranaccula (Bolt.) Schr. on Thalictrum, 641 and 642;
Exaerus alni incanae Kuhn on Alnus incana, 645; Puccinia cirsicae F. on Cirsus
Istetiana, 587; Septoria lobesiae Pak. on Lobelia spathulittla, 632; Circopora aspeleo-
sidis Pak. on Passera quinqueflora, 650; Fuscidiadium plurimum (Lib.) Fock on Amelanc-
chier splcata, 668; Erysiphe communis (Wallr.) Schl. on Lathyrus ochroleucus, 651;
Cercospora subangulins E. & E. on Smlacina racemosa, 577; Cylindrosporium padi
Kast on Prunus pensylvanicana, 306; Ramularia Tulanesi Sacc. on Fragaria; Piggotia
fraxini B. & C. on Fraxinus pennylvanica; Erysiphe communis (Wallr.) Schl. on
Ranunculus; Microsphaera alni (Wall.) Salm. on Symphoricarps Uredo undetified
on Glycerhia lepidota; Calyptospora goeppertiana Kuhn on Vaccinium; Exobasidium
Cassandrae Pak. on Cassandra calyculata, 33; Gloeoporum sp. on Quercus, 687;
Peridermium elatinum Schm. & Kze. on Abies balsamea.

SYSTEMATIC CATALOGUE OF THE FERNS, CLUB MOSSES AND
FLOWERING PLANTS
POLYPODIACEAE Fern Family
Aspidium Thelypteris (L.) Sw. Marsh shield fern. Star Island, 603, 597. Common
in marshes.
Aspidium noveboracense (L.) Sw. Northern shield fern. Cedar Island, 40. In sandy
woods.
Young growth of Jack Pine (Pinus divaricata) on Star Island.
EQUISETACEAE Horsetail Family


*Equisetum hyemale* L. var. robustum (A. Br.) A. A. Eaton. Scouring rush.

LYCOPODIACEAE Club Moss Family


PINACEAE Pine Family


*Pinus reniformis* Ait. Star Island, 493. Common. The most important tree on the island.


NAJADACEAE Pondweed Family


ALISMACEAE Water-Plaintain Family


HYDROCHARITACEAE Frog’s Bit Family


GRAMINEAE Grass Family

*Andropogon scoparius* Michx. Little blue stem. Star Island, Norway Beach.

*Zizania palustris* L. Wild rice. Common in all of the shallow lakes.

*Phalaris arundinacea* L. Reed grass. Swamps, 650. Cedar Island, 47.

*Muhlenbergia raetacea* (Michx.) B. S. F. Cass Lake, 232. Low grounds.


*Phleum pratense* L. Timothy. Naturalized on the island. Star Island, 675.

*Calamagrostis canadensis* (Michx.) Beauv. Star Island, 824. Common.

*Brachyelytrum erectum* (Schreb) Beauv. Cedar Island, 41. In woods, also observed on Star Island.


*Sphenopholis palens* (Spring.) Scrib. Cedar Island, 46. In swamps.

*Poa triflora* Gilib. Fowl meadow grass. Star Island, 17, swamps.


*Bromus ciliatus* L. Hairy chess. Common in moist woods, 18, 620.


*Agropyron tenerum* Vasey. Slender wheat grass. Open places, shore of Cass Lake.

*Star Island, 848.


CYPERACEAE Sedge Family
Scirpus validus Vahl. Star Island.
Carex filiformis L. In bogs around Cass Lake.

ARACACEAE Aroid Family
Arisaema triphyllum (L.) Schott. Star Island, 489. In broad lea-red woods.
Calla palustris L. Water arum. In bogs with sphagnum moss. Star Island, 80, 590.

JUNCACEAE Rush Family

LILIACEAE Lily Family

ORCHIDACEAE Orchid Family
Cypripedium hirsutum Mill. Showy lady slipper. Cass Lake. Bode & McNutt. In low grounds on the shore. The writer did not see this, but reported to me several times.
Habenaria bracteata (Willd.) R. Br. Star Island. No specimens in collection. This was observed.
Habenaria psycodes (L.) Sw. Purple Fringed orchid. Meadows, Cass Lake.

SALICACEAE Willow Family
Salix amygdaloides Anders. Peach-leaved willow. Found only on the shores of Cass Lake. Star Island, 629. Cass Lake, 596. The few specimens observed are small.
Salix floratillosa Nutt. Sandbar willow. This is the S. longifolia Mühl. (Robinson and Fernald Gray's Man. of Bot. 7 ed. 528 f. 544.) Common on the shores of Cass Lake. Star Island, 856.
Photographed by Prof. G. B. MacDonald.
Balm of Gilead (Populus balsamifera) on Star Island.


Salix petiolaris Sm. Pussy willow. Cedar Island. This may be the S. pelita Anders. Specimens not sufficient for determination. Star Island, 14, 502, 589, 584. Cass Lake, 83.


Salix candida Flugge. Hoary willow. Cass Lake, 30. In a bog near boat landing. I expected to find this willow common in the bogs. The only place where it was common was in a bog near the boat landing growing with Cornus stolonifera and Carex sp.


Betula latifolia Michx. Yellow birch. Not common on island. Mr. Truax first observed a few young trees on the island between the hotel and the east beach near the trail. Star Island, 521, 62. More abundant on the mainland. It is common northeastward in Minnesota and Wisconsin.


Abras Incana (L.) Moench. Speckled alder. Common shores of Lake Helen, Norway Beach, 844, and shores of Cass Lake; Lake Helen, 667; Cedar Island, 585. The catkins are frequently attacked by a fungus Knosumus.


Quercus rubra L. Red oak. Cass Lake, 864. The cups are comparatively shallow, the leaves are more deeply cut. Star Island, 585, 838. Leaves deeply cut but without acorns. A small tree appears to be Q. rubra L. as well as No. 60, 61, also on Star Island, with small acorns and a rather shallow cup and smooth scales but more deeply lobed leaves appeared to belong here. Star Island, 587, 306. In Robinson and Fernald Gray's Manual (7th ed.) the Q. borealis is given as a synonym of Q. coccinea var. ambiguus Gray. On the sandy cut over lands near Cass Lake this species is often a low scrubby tree. There is also much variation in the cups and lobing of the leaves on the oaks found near Norway Beach on the mainland. Cass Lake, 195, 196.

Quercus coccinea Moench. Scarlet oak. This oak is also quite variable occurring on sandy cut over lands, often scrubby, small trees bearing acorns. Cass Lake, 25, 197, 209, 308. Norway Beach, Cass Lake, 801, 808.
URTICACEAE Elm Family


Celtis occidentalis L. Hackberry. Star Island, 871.


SANTALACEAE Sandalwood Family


POLYGONACEAE Smartweed Family


CHENOPODIACEAE Goosefoot Family

Chenopodium hybridum L. Star Island, 792. Not common.


NYCTAGINACEAE Four-O'Clock Family


CERATOPHYLLACEAE Hornwort Family

Ceratophyllum demersum L. Hornwort. In water, Cass Lake, Star Island, 837.

NYMPHAEACEAE Water Lily Family


RANUNCULACEAE Crowfoot Family


Anemone quinquefolia L. Wood anemone. In woods with the hard maple. Star Island.


Thalictrum revolutum D. C. Meadow rue. Star Island.

Actaea alba (L.) Mill. Cedar Island, 38.

MENISPERMACEAE Moonseed Family

Menispermum canadense L. Star Island, 827. The broad leaved climbing plant in woods with elm and basswood.

BERBERIDACEAE Barberry Family


PAPAVERACEAE Poppy Family


FUNMARIACEAE Fumitory Family


CRUCIFERAE Mustard Family

Erysimum cheiranthoides L. Worm-seed mustard. Cedar Island, 578, in pine woods.


The A. lyrata probably also occurs but not observed.

Red Elm (*Ulmus fulva*). Photographed by Prof. G. B. MacDonald.
THE FLORA OF STAR ISLAND AND VICINITY

CAPPARIDACEAE Caper Family


SAXIFRAGACEAE Currant Family


ROSACEAE Rose Family


Pyrus americana (Marsh.) D. C. Mountain ash. Star Island, 805. Bank Lake Helen, not common.

Rubus idaeus L. var. aculeatissimus (C. A. Mey,) Regel & Tilling. Rubus striigosus Michx. Red raspberry. This is abundant everywhere on the island except in bogs. Large quantities of berries are picked. Star Island, 881.

Rubus vinulosus Alt. Dewberry. Common in woods and often trailing on the ground. Norway Beach, 288.

Potentilla monspeliensia L. var. norve&'ica (1) Rydb. Cass Lake, 622.


Rosa Woodsi, Lind!. Rose. Cedar Island, swamps. Star Island, 769, 855. This may be R. blanda.


LEGUMINOSAE Pulse Family


Desmodium canadense (L.) D. C. Tick trefoil. Head of Cass Lake, 670.


Glycyrrhiza lepidota (Nutt,) Pursh. Wild liquorice. Star Island. Norway Bluff, 448. Open sandy bank. This is a typical prairie plant.


Lathyrus ochroleucus Hook. Yellow flowered vetchling. The most common species.

ANACARDIACEAE Poison Ivy Family


CELASTRACEAE Bitter Sweet Family

Celastrus scandens. Star Island, 528.
ACERACEAE Maple Family
Acer spicatum Lat. Mountain maple. Common everywhere on the island, 787, 83.

BALSAMINACEAE Jewel Weed Family

RHAMNACEAE Buckthorn Family

VITACEAE Grape Family
Vitis vulpina L. Wild grape. Fox grape. Star Island. The wild grape is somewhat rare on the Island.

TILIACEAE Basswood Family

CISTACEAE Pinweed Family

VIOLACEAE Violet Family

ONAGRACEAE Evening Primrose Family
Epilobium angustifolium L. Fireweed. Star Island, 54, 518. Common in burnt over areas.
Epilobium coloratum Muhl. Star Island.
Circsea lutetiana L. Cedar island, 56. Star Island, 516. The C. alpina was not observed. It doubtless occurs. Common about Duluth, Lake Superior.

ARALIACEAE Ginseng Family
Aralia nudescens L. Wild Sarsaparilla. Star Island.

UMBELLIFERAE Carrot Family
Cicuta bulbifera L. Swamp Cowbane. In swamps, 71, 509.

CORNACEAE Dogwood Family
Cornus canadensis L. Dwarf cornel or dogwood. Star Island, 353. Common in pine woods. The large white bracts (flowers) and bright red fruit makes it easily recognized.
Vegetation in Norway Pine woods—Club Moss (Lycopodium) and False Solomon Seal on Star Island.
ERICACEAE Heath Family


Pyrola secunda L. Star Island, 319, 835.


Ledum groenlandicum Oeder. Labrador tea. Common in all of the larger sphagnum bogs, especially on the margins. Star Island, 701, 826, 828.


Andromeda glaucophylla Link. Star Island, 598. In cold sphagnum bogs.


PRIMULACEAE Primrose Family


BORAGINACEAE Borag Family


LABIATAE Mint Family


Monarda fistulosa L. Wild bergamot. Sandy open woods, Norway Beach on the mainland, 280.

Mentha arvensis L. Star Island, 83. Low grounds.

SOLANACEAE Potato Family

PHRYMACEAE  Lopseed Family

SCHROPHULARIACEAE  Figwort Family

RUBIACEAE  Madder Family

CAPRIFOLIACEAE  Honeysuckle Family
Viburnum Lantago L. Wild raisin. Star Island, 80, 681. In low grounds, swamps.
Sambucus canadensis L. Common elder.

CAMPANULACEAE  Bellflower Family
Campanula rotundifolia L. Harebell bluebell. Star Island, 826. Sandy open places.

LOBELIACEAE  Lobelia Family
Lobelia aiphilitica L. Great lobelia. Star Island, 80, 681. In low grounds, swamps.

COMPOSITAE  Aster Family
Solidago latifolia L. Goldenrod. Star Island in woods, 800.
Solidago serotina Ait. Star Island, 666, in swamps.

  In clearings and burns.


Anthemis Cotula L. Mayweed. Star Island, near cottages.

Achillea Millefolium L. Yarrow. Star Island, 441. Open places.


Prenanthes alba L. Rattlesnake root. In woods, Star Island, 668.


Lactuca palchella (Pursh.) D. C. Blue lettuce. Shores Star Island.